The Evaluation of the National Heart, Lung, and Blood Institute Short-Term Training for Minority Students Program

Final Evaluation Report

Submitted to:

National Heart, Lung, and Blood Institute
National Institutes of Health

Contract No. N02-HL-6-3566

J~RA
Corporation

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July 7, **1999**

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Section 1

Background

Section 1

Introduction

Although the number of minority individuals pursuing advanced degrees in the biomedical and behavioral sciences increased in the last decade, underrepresentation of minorities in these fields continues to be a problem. For example, the number of doctorate degrees in the biomedical and behavioral sciences awarded to individuals from underrepresented minority populations (Blacks. Native Americans, and Hispanics) almost doubled between 1986 and 1996 (National Research Council, Survey of Earned Doctorates, 1998).~ In 1996, however, the total number of doctorate degrees awarded to minorities in these fields only accounted for 7.5 percent of the total degrees received. Furthermore, according to the Association of American Medical Colleges (AAMC), U.S. medical schools graduated more underrepresented minorities than ever that year and the number of minorities applying to medical school reached a new record. A total of *5,259* minority students applied to the nation's medical schools, representing 11 percent of all applicants. (AAMC, 1997). Yet, only *3.5* percent of all U.S. medical school faculty holding Ph.D.s in the biomedical and behavioral sciences, and only 3.6 percent of those with combined M.D./Ph.D. degrees are members of underrepresented minority groups.

Some of the increases in the number of underrepresented minorities receiving advanced degrees in the biomedical and behavioral sciences may be attributed to the various programs and special initiatives targeting underrepresented minorities interested in the sciences. For example, over the past decade, the National Institutes of Health (NIH) has supported programs such as the Minority Access to Research Careers (MARC), Minority Biomedical Research Support (MBRS), the National Heart, Lung, and Blood Institute (NHLBI) Short-Term Training for Minority Students Program (STMSP), and others to alleviate the shortage of underrepresented minorities in the biomedical and behavioral sciences. These programs'have also stimulated many universities and foundations to develop their own efforts to increase participation of minorities in these areas. However, to sustain the gains achieved in alleviating the dearth of qualified minority researchers and increase the number of underrepresented minority individuals pursing these careers, effective training programs must be examined to identify those elements that make them successful so they can be implemented on a broader scale.

In recognition of this need, the NHLBI commissioned an evaluation of one of its programs, the STMSP, to determine its effectiveness and identify ways to improve the program. If effective, the STMSP could be used as a model for other institutions. This would also help fill the void of minority individuals who can serve as role models for other young people interested in pursuing careers in the sciences. Moreover, there is evidence that underrepresented minorities collectively are reluctant to participate in population-based research studies. Since minority individuals generally have more severe experiences with some of the more life-threatening illnesses and diseases in society

1Although Pacific Islanders are underrepresented in the sciences, separate data for this minority group were not available in the survey.

today, it is imperative that ways to respond effectively to this dilemma be found. Ensuring more minority representation in the biomedical and behavioral sciences through programs like the STMSP could perhaps serve as one of these efforts.

1.1 The Short-Term Training for Minority Students Program

1.1.1 STMSP Features

The STMSP is designed to accomplish three goals:

- Provide minority undergraduate and graduate students and students in health professional schools exposure to opportunities inherent in research careers in areas relevant to cardiovascular, pulmonaiy, and hematologic health and diseases, transfusion medicine, and sleep disorders.

- Attract highly qualified minority students into biomedical and behavioral research careers in the areas of heart, lung, and blood health and diseases, transfusion medicine, and sleep disorders.

- Bolster the already short supply of qualified minority investigators.

By 1996, forty-three 5-year STMSP grants had been awarded to universities, hospitals, and research centers nationwide. The STMSP grants are intended to expose minority undergraduate, graduate, and health professional students to career opportunities in biomedical and behavioral research by providing them with short-term research training experiences, combined with mentoring by experienced researchers, in various research areas. The full-time training experiences are available for 2 to 3 months during the summer and focus on research activities related to heart, lung, or blood health and diseases, transfusion medicine, and sleep disorders. In addition to the research training experience, institutions provide enrichment activities such as seminars, guest lectures, or courses in research methods. Throughout their participation in the STMSP, trainees receive a monthly stipend. Funds are also provided in the grant to cover the trainees' training and travel expenses as well as housing.

Each institution is responsible for recruiting and selecting trainees for their respective programs that may range in size from 4 to 24 students. Trainees must be underrepresented minority students who have successfully completed at least 1 year of undergraduate school or 1 semester of graduate or health professional school. Individuals holding doctoral degrees are not eligible for the STMSP. All trainees must be U.S. citizens, noncitizen nationals, or have been lawfully admitted to the U.S. for permanent residency.

1.1.2 Need for STMSP Evaluation

As the first group of STMSP grantees reached the end of their 5-year award, the NHLBI requested an evaluation to examine the strengths and weaknesses of the program and to

determine whether the program's objectives were being met. The following are the primary objectives of the evaluation:

- Determine how effective STMSP grantees had been in meeting the program goals.
- Determine the elements of successful STMSPs that contributed to program effectiveness.
- Determine the characteristics of students who are most likely to benefit from the STMSP.
- Assess the ability of grantees to recruit a significant number of under-represented minorities into biomedical and behavioral research.
- Identify program modifications that could improve the effectiveness of the STMSP.

The NHLBI conducted the evaluation in two phases. The first phase was completed by KRA Corporation (KRA) in September 1995. It involved developing the methodology to evaluate the STMSP, designing and pretesting the data collection instruments, and preparing a preliminary clearance package for submission to the Office of Management and Budget **(0MB).** During the second phase, KRA, after making minor modifications to the methodology based on the pretest experience, conducted the evaluation.

1.1.3 The Evaluation Report

This report presents the findings of the evaluation as well as a description of the methodology.[2]

Section 2 of this report presents a discussion on the data sources and survey methodology, the respondent sample, and the limitations of the evaluation. Sections 3 through 6 present the results of the evaluation based on data from trainees, applicants, program directors, and faculty and research staff, respectively.

Section 7 contains the summary of the case study site visits and Section 8 presents conclusions and recommendations.

2 **A more** detailed description of the methodology and the background on its development are found in unpublished reports submitted to the NHLBI as part of the contract deliverables. These reports include *The Revised Final Methodology Report* and *The Analysis Plan.*

Appendix A contains all of the data collection instruments, including the survey questionnaires and the case study topic guides. and Appendix B includes the individual case study site visit reports.

* * * *

Section 2

Methodology

Section 2

Methodology

2.1 Overview

The NHLBI specified the following five objectives for the evaluation of the STMSP:

1. Determine how effective STMSP grantees had been in meeting the program goals.

2. Determine the elements of successful STMSPs that contributed to program effectiveness.

3. Determine the characteristics of students who are most likely to benefit from the STMSP.

4. Assess the ability of grantees to recruit a significant number of underrepresented minorities into biomedical and behavioral research.

5. Identify program modifications that could improve the effectiveness of the STMSP.

To meet these objectives, outcome and process evaluations were conducted using data from multiple sources.

For example. Objective 1 required that information be collected on the experiences of former trainees for as long a time period as possible to determine what proportion pursued course work and degrees in the biomedical and behavioral sciences related to heart, lung, or blood health and disease, transfusion medicine, or sleep disorders; and what proportion entered into a research career in those areas. It also required that some estimate be developed of how many trainees would have made the same educational and career choices in the absence of the STMSP. The traditional design elements to provide this information included developing preprogram and postprogram measures on critical outcomes and developing a control or comparison group. Together, these strategies provided the most reliable indication of whether the program achieved its purpose.

Objectives 2 and 3 required that the evaluation design not only produce information on the career paths of former trainees, but also develop detailed descriptive information about program implementation and student characteristics. This element of the evaluation design was critical because the STMSP grant announcement gave institutions great flexibility in structuring programs and determining the kinds of activities that could be provided. Similarly, the range in ages and qualifications of potential students was broad.

The design for Objective 4 required two types of information. The first type was descriptive information on each grantee's applicant pool and the procedures used to recruit and select applicants. The second type was the long-term education and career choice information developed to meet

Objective 1. Analyses of these data were conducted to determine whether the grantees were attracting sufficient numbers of minority students and whether the students continued the pursuit of biomedical or behavioral science degrees andlor career paths.

To meet Objective 5, the evaluation design focused on analysis that correlated characteristics of the programs (e.g., activities, procedures, and location within the institution), characteristics of the trainees, and program outcomes. In addition, the evaluation design incorporated experiences, opinions, and recommendations of local STMSP directors, participating research faculty/staff, and former trainees and applicants.

The research design employed two evaluative strategies—a process evaluation and an outcome evaluation. The process evaluation examined the program's functioning to describe its implementation, components, and features as well as the characteristics of STMSP trainees. It also addressed issues such as how institutions met their goals, the problems they encountered and their solutions, and how to improve the STMSP.

The outcome evaluation assessed whether the STMSPs were effective in meeting the program goals and in identifying both grantee and trainee characteristics that are associated with the intended effects. Collectively, these strategies provided the descriptive and demographic characteristics of trainees, identified the outcomes that measure success, examined the type of grantee institutions that operate STMSPs, and examined the various types of STMSPs that are available to trainees.

2.2 Data Sources and Methodology

The primary sources and methods of data collection included the following:

- **Extraction of data from the** NHiLBI **grantee records, applications, and progress** reports—Using this information, KRA staff developed profiles describing the key characteristics of each STMSP grantee. This information served as a basis for refining the proposed research design.

- **A mail survey of STMSP directors—The STMSP director questionnaire focused** on issues pertaining to the specific implementation and administration of the STMSP at each site, discussions of changes in the program over time, and factors related to the successes and failures of the program.

- **A mail** survey **of participating research faculty and staff—The** STMSP staff questionnaire focused on the characteristics of the research faculty and staff, their background and qualifications, their role in the training program, perceptions of the program's impact, and recommendations for improving the STMSP.

- **A mail survey of** former trainees—The trainee questionnaire collected data about the characteristics of the students who participated in the program, their program activities, their educational and career plans, patterns of postprogram course taking, entrance into graduate or professional programs, employment, their perceptions of

the impact of the program on their educational goals and career plans. and their suggestions for improving the program.

- **A mail survey of nonparticipating applicants—This questionnaire included any** key preprogram information not contained in program records, a description of college and graduate course work, employment history, whether the individual participated in any other programs designed to attract minorities into biomedical and behavioral research careers, and items to assess career aspirations and commitment.

- **Case studies of** selected sites—Case studies were conducted at five sites. Data collected during on-site visits included information from direct observation of STMSP activities, more extensive interviews with staff and current trainees, and a more extensive review of STMSP records and reports.

Data collection instruments appear as Appendix A.

Standard mail survey followup procedures were used to contact former STMSP trainees and applicants. Advance letters were mailed to all potential respondents to introduce the evaluation and its purpose, and to advise them that a copy of the questionnaire would be sent soon. One week later, the initial mailing package was sent out. This mailing contained a cover letter requesting participation in the evaluation along with information required by the Privacy Act (e.g., participation is voluntary, information is confidential) and a copy of the questionnaire. The cover letter also noted that responses could be submitted via the Internet by accessing KRA's home page.' One week after the initial mailing, postcard reminders were sent to all trainees and applicants. One week after the postcard mailing, a reminder letter was sent to each trainee/applicant nonrespondent. Approximately 7 weeks after the initial mailing, a second copy of the questionnaire was sent to each nonrespondent.

Similar procedures were used for the STMSP directors and faculty/research staff. However, rather than a separate mailing, reminder letters were sent to these individuals along with a second copy of the questionnaire.

2.3 The Sample

All STMSP program directors, trainees, and applicants were included in the survey; a sample of three faculty/research staff was drawn from each of the 42 STMSP institutions that participated in the evaluation.[2]

A total of 21 individuals responded to the survey via the Internet, including 1 director, 5 applicants, and 15 trainees.

2 One of the STMSP grantees decided not to participate in the program evaluation.

2.3.1 The Trainee and Applicant Sample Frames

The table below shows the evolution of the respondent groups for trainees and applicants. Names and addresses of the two groups were obtained from the NHLBI Trainee Appointment File (TAF) and from the grantee institutions participating in the STMSP program. After removing duplicate names resulting from individuals who participated more than once or applied in more than 1 year or to more than one institution, there were 1,493 potential trainees and 1,207 applicants.[3] Both the original trainee and applicant lists contained incorrect addresses (295 and 204, respectively) and individuals who never participated or were not familiar with the STMSP program (29 and 28. respectively).[4] In addition, the original list of trainees included individuals who participated in 1997 (38) and individuals with phone numbers that had been disconnected (42).~ Thus, the resulting sample size for trainees was 1,089 (73 percent of the original list) and 975 (81 percent) for applicants.

Table 2-1

Survey Response Results

Sample Outcomes	Trainee	Applicant
Original Listing	1,493	1,207
Incorrect Address	295	204
Disconnected Phone	42	0
1997 Trainee	38	0
Never Participated/Not Familiar	29	28
Survey Population	1,089 (73%)	975 (81%)
No Response	497	754
Survey Respondents	592 (54%)	221 (23%)

Applicants are individuals who applied to the STMSP but did not participate in the program, either because they were not accepted or chose not to participate.

~These are individuals who contacted KRA by telephone and stated that they either had never participated in or were not familiar with the STMSP.

~Because the evaluation covered only program years 1992 through 1996, individuals whose initial participation in the STMSP did not occur until 1997 were excluded from the survey.

2.3.2 Nonresponse

Despite following all the standard mail survey procedures described earlier, the response rates for both the trainees and applicants were low. The two primary reasons for the nonresponse among these groups appeared to have been related to not having up-to-date mailing addresses for the majority of trainees and the lack of recognition of the program name.

In terms of the latter, it was found that although the program evaluated under this project is known nationally as the "NHLBI Short-Term Training for Minority Students Program," many institutions that implemented the program referred to it by a different name. As a result, many program participants (and program applicants) believed that the questionnaire they received—which referred to the program as the Short-Term Training for Minority Students Program—was not applicable to them.

In order to rectify these problems and increase the response rates, the following strategies were used.[6] First, KRA staff attempted to obtain current addresses for STMSP participants by contracting with Equifax, a credit company with access to numerous national data files. KiRA staff submitted *650* names to Equifax, and received new addresses and telephone numbers for approximately 462 individuals. Using the new addresses, a third mailing was sent to all trainees who had not responded to the survey. This mailing included another copy of the questionnaire along with a cover letter advising trainees that while the program being evaluated was known nationally as the Short-Term Training for Minority Students Program, they may not know the program by this name. Therefore, the letter also provided the name of the institution where trainees participated in the program and the dates of participation in an effort to provide them with a frame of reference for completing the survey. While this effort helped to boost the response rates, it did not result in rates that were satisfactory. Consequently, KiRA also contracted with Marketing & Research Resources, Inc., a local telephone survey company, to conduct followup telephone interviews with trainees who had still not responded to the survey. Using the telephone numbers provided by Equifax, nonrespondents were then contacted by telephone and an abbreviated version of the questionnaire was administered. These contacts resulted in the completion of 120 additional surveys.

In summary, of the 1,089 trainees who could be contacted either by mail or telephone, the number of responses was 592, or 54 percent. For the 975 applicants, the response rate from the mail survey (with no telephone followup) was 221, or 23 percent.

[6] Because of time and budget constraints, these efforts were limited to trainees.

2.3.3 Analysis of Nonrespondents

To examine the effects of the inability to contact some potential respondents and nonresponse among trainees who could be contacted, information on these populations was obtained from their statement of appointment forms in the NI-ILBI TAF database. These data were limited to gender, race, and academic major at the time of their appointment to the program. The numbers of individuals in each respondent group in total and for which data were available from the NHLBI records are presented in Table 2-2.

Table 2-2

Availability of Characteristics Data of Trainee Respondents, Nonrespondents, and Noncontacts

Trainee Type	[_Total_]	__Gender_J	_Race_J	Major
Respondents	592	460	389	389
Nonrespondents	507	367	None	310
Noncontacts	466	288	None	242

2.3.4 Available Information

As shown in the table, these three variables—gender, race, and academic major—were only available for some of each group. Note, for example, that trainee race/ethnicity information is only available for the "Respondent" population and only for 389 trainees (66 percent). This information was obtained only from the survey because race data in the TAF database are encrypted and not released. Gender and academic major data are generally available for all types of trainees, but at least 30 percent of the cases had missing data.

The chi square value to determine the probability difference between the distribution of gender for the trainees and the nonrespondents and noncontacts were calculated at 0.160 and 0.603, respectively. These values are below the critical value for the chi square at the 95 percent confidence level with one degree of freedom (3.841). Thus, the distributions of gender for the nonrespondents and noncontacts are not significantly different from those of the respondents, as shown in Table 2-3.

Table 2-3

Trainee Respondent, Nonrespondent, and Noncontact Gender

Trainee Type	Number_j_Percent Male		Number Female		Number Total
Trainee Respondent	**160**	**34.8**	300	65.2	**460**
Nonrespondent	130	35.4	237	64.6	367
Noncontact Gender	111	38.5	177	61.5	**288**

2.3.5 Academic **Major**

The distribution of academic major for each of the three respondent populations for which data were available are shown in Table 2-4. KRA also calculated the chi square value of the difference between the distribution of nonrespondents and noncontacts to the distribution of respondents for academic major at the time of their appointment to the program.[7] The calculated values were 7.407 and *5.754,* respectively. This compares to a critical value at the 95 percent level of significance and seven degrees of freedom of 14.067. Thus, we conclude that the distribution of academic major at appointment to the STMSP for nonrespondents and noncontacts is not statistically different from that of the survey respondents for whom we had data available.

~ Information for trainees' majors was obtained from the TAF database.

Table 2-4
Trainee Respondent, Nonrespondent, and Noncontact Major

Major	Trainee		Nonrespondent		Noncontact	
	Number	Percent	Number	Percent	Number	Percent
Arts and Humanities	3	0.8	8	2.6	3	1.2
Biological Sciences	264	67.9	204	65.8	153	63.2
Education	8	2.1	6	1.9	4	1.7
Engineering	9	2.3	5	1.6	3	1.2
Health Sciences	28	7.2	25	8.1	16	6.6
Mathematical and Physical Sciences	43	11.1	31	10.0	33	13.6
Social Sciences	14	3.6	20	6.5	18	7.4
Other Specialties[8]	20	5.1	11	3.5	12	5.0
Total	389		310		242	

2.3.6 Conclusion

We can find no evidence, using the available data, of significant differences between the trainees who responded to the survey, those who were contacted, but did not respond to the survey, and those who could not be contacted.

2.4 Limitations of the Evaluation of the STMSP

Certain features of the STMSP and the timing of the evaluation had an impact on the ability to measure the effectiveness of the STMSP in meeting its goals. These factors are discussed below.

2.4.1 Impact of the STMSP Will Take Years to Emerge

The STMSP seeks to facilitate a fundamental change in the practice of biomedical and behavioral research: The long-term goal is to increase the number of minority investigators in areas related to cardiovascular, pulmonary, and hematologic disease, transfusion medicine, and sleep disorders. To accomplish this goal, the STMSP seeks to attract students to these research areas as early as their second year of college. If the program is successful, the former trainees will achieve greater-than-average success in their schooling, further studies, employment, on-the-job advancement, sphere of responsibility, influence on others, professional activities, and recognition. However, it will take years for a former trainee to

~This category included disciplines such as law, social work, or other fields not included on the Academic Major and Employment Speciality list enclosed with the survey questionnaire.

demonstrate the efficacy of early exposure to research and to foster an identity with it as a career. Therefore, one cannot expect to observe changes in the flow of qualified minority researchers into the workforce as a result of the STMSP, except in the long term—perhaps a decade or more after program inception. Thus, the evaluation focused on various short-term trainee outcomes, such as changes in aspirations toward a research career, majors in the biomedical and behavioral sciences, the number of graduate students with degrees in the biomedical and behavioral sciences, whether trainees entered graduate school, and the extent to which trainees were involved in related professional activities, including publishing/presenting research papers.

2.4.2 Effect of the Range of Educational Stages of the Trainees and Variability in Time Elapsed Since Program Participation

Developing a set of outcome measures for the STMSP was further complicated by two factors. One is that programs may admit undergraduate students as early as the summer after their freshman year, whereas others may also include students in graduate and health professional programs. This variation, along with the fact that the evaluation called for having four annual cohorts of trainees, resulted in a diverse participant population in terms of their current education and career status. Some participants had already embarked on careers while others were still undergraduate students.

The trainees who were closer to completion of their schooling when they participated in the STMSP exhibited more quickly career choices through their entry into the labor force; data about job titles and job descriptions yield the strongest measures of whether these trainees have entered research careers in the targeted areas. For those who entered the STMSP program at the end of their freshman year, more appropriate measures of program impact were course selections, declaration of a major, plans for additional education, and career aspirations.

A similar factor that complicated selection of outcome measures was elapsed time since participation in the STMSP. The first STMSP trainees entered the program in 1992.~ Five and one-half years had elapsed before this data collection, so many types of appropriate outcome measures were available. All 1992 undergraduate students had at least completed their undergraduate degrees; therefore, information about completed courses, majors, and grade point averages were collected. In addition, most of the participants had either entered the labor force or pursued additional education. Nearly all of the trainees who were graduate students in 1992 and 1993 had completed (or dropped out of) their educational programs and entered the labor force. However, for each subsequent cohort of trainees, (i.e., those entering in 1993 through 1996), these program outcome measures are less appropriate, due to each cohort's relatively shorter academic or work careers. It is not reasonable to assume that the youngest trainees in the 1996 program had declared a college major or had

~ Although the first STMSP grants were awarded in 1991, the majority of grantees did not begin serving trainees until the summer of 1992.

completed required core courses; therefore, their preference for courses related to biomedical or behavioral research had not necessarily been manifested.

2.4.3 Controlling Self-Selection by Schools and Students

The universities participating in the STMSP traditionally may attract the most qualified applicants for admission and possibly may be the most selective. Therefore, even without the STMSP, it is plausible that these schools could attract larger numbers of qualified minority students. In addition, trainees who have completed an STMSP program could be more successful in gaining admission and financial support for higher levels of education, obtaining employment in the field of science, advancing in responsibility, participating in professional activities, and other indicators of success in and commitment to science. Therefore, estimating to what degree the STMSP augmented the careers of biomedical and behavioral researchers who may have been destined to be more successful than their contemporaries was somewhat problematic.

2.4.4 Program Participants' Familiarity With the "Short-Term Training for Minority Students Program"

Throughout the survey, KRA maintained a 1-800 toll-free telephone line established to help support the mail surveys. As noted earlier, many institutions implementing the program referred to the STMSP by another name. Based on conversations with individuals who contacted KRA through the 800 line, it was found that many participants were not familiar with the program. While in most instances, using information from the NHLBI grant applications, KRA staff were able to identify the local program name and thereby resolve the matter, this was not always the case. For instance, KRA staff could not always determine if the program was actually referred to by a name other than the STMSP. Some trainees maintained that they did not participate in the program even though their names were provided by either the NHLBI or STMSP program staff as individuals who had in fact participated. Moreover, this issue could only be addressed for those individuals who contacted KRA. However, it was the contention of KRA staff that there were many other individuals who did not respond to the survey because they believed that they received the questionnaire in error but who did not call KRA to clarify the situation.

In summary, the evaluation of the STMSP was constrained by differences in interventions by individual grantees, differences in the stage of preparation for the workforce among the trainees, and lack of recognition by program participants of their involvement in the STMSP.

* * * *

Section 3

Results: Trainees

Section 3

Results: Trainees

The Trainee Population

A total of *592* trainees responded to the survey. The results of the evaluation presented in this section reflect both the number of trainees who responded to each of the data items and the percentage of the total number of trainees who responded to that item. Therefore, the total respondents reported in each table can change from item to item, due to missing data resulting from nonresponse. Resulting percentages were calculated using the total *number of respondents for each item, not the total number of respondents to the survey* However, in those instances when multiple responses could have been given to a data item, the *total number of trainees* was used to calculate the total number of respondents and the resulting percentage for that item.

3.1 Trainee Characteristics

The trainee sample was sorted into three categories: undergraduate, graduate, and health professional students. Assignment to these categories was based on the trainee's educational status at the time he or she first participated in the STMSP program. According to the survey, most of the trainees were undergraduate students (82 percent), 5 percent were graduate students, and 13 percent were enrolled in a health professional school. This resulted in a total of *578* trainees, i.e., 470 undergraduate students, 31 graduate students, and 77 health professional students. (It should be noted that these totals were used for the multiple response data items when the survey results were presented by trainee status). Two percent did not specify their student status, and are therefore not included in tables that display data by student category.

The questionnaire requested the following demographic characteristics of the trainees: gender, race and ethnicity, date of birth, and citizenship status. Additionally, education-related characteristics were obtained. Trainee characteristics are presented below.

3.1.1 Trainee Gender

As shown in Table 3-1, the majority of all STMSP trainees were females. Two-thirds of the undergraduate students were female, with slightly lower percentages for graduate and health professional students (60 and *59* percent, respectively).

Table *3-1*

Trainee Gender

Trainee Gender	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent_j_Number		Percent
Male	155	33.5	12	40.0	31	41.3
Female	308	66.5	18	60.0	44	58.7
Total	463		30			

3.1.2 Trainee Race and Ethnicity

Table 3-2 presents the race and ethnicity of STMSP trainees. Within each category of trainee, approximately two-thirds of all STMSP participants are Black, accounting for 64 percent of undergraduate students, 60 percent of graduate students, and 71 percent of the health professional students. The table also indicates that while 37 percent of graduate students are Hispanic, only 16 percent of the undergraduate students and 15 percent of the health professional students fell within this ethnic group. Further, there were no American Indian/Alaska Native nor Asian/Pacific Islander trainees within the graduate student category. It should also be noted that approximately 3 percent of all the trainees fell within the "other" category, which includes individuals who identified themselves as Haitian American. Portuguese, African, Basque, and biracial.

Table 3-2

Race and Ethnicity of STMSP Trainees

Ethnicity of Trainees	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
American Indian/Alaska Native	14	3.0	0	0.0	3	4.0
Asian/Pacific Islander	61	13.3	0	0.0	5	6.7
Black, Not of Hispanic Origin	292	63.5	18	60.0	53	70.7
Hispanic	75	16.3	11	36.7	11	14.7
White, Not of Hispanic Origin	3	0.7	0	0.0	0	0.0
Other	15	3.3	1	3.3	3	4.0
Total	460		30		75	

3.1.3 Trainee Date of Birth/Age

Trainees were asked to report their date of birth. As shown in Table 3-3, the majority of undergraduate students (71 percent) were born between 1973 and 1976. Assuming that trainees participated in the program somewhere between 1991 and 1996, this would suggest that the average age of most undergraduate students was 19 when they entered the STMSP. As would be expected, graduate and health professional students were older—56 percent of the graduate students and 41 percent of the health professional students were born between 1969 and 1972 and the average age of these individuals when they entered the STMSP was 22. The table also shows that some trainees were born prior to 1960 and/or after 1976. suggesting that some trainees may have been in their early thirties or late teens when they entered the program. However, the number of trainees born before 1960 are approximately 1 percent of all participants, and those born after 1976 represent less than 9 percent of the undergraduate students and less than 4 percent of the graduate students.

Table 3-3

Trainee Year of Birth

Trainee Year of Birth	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Before 1960	3	0.7	1	3.7	1	1.4
1960-1964	3	0.7	3	11.1	3	4.2
1965-1968	9	2.1	0	0.0	14	19.7
1969-1972	72	17.1	15	55.6	29	40.8
1973-1976	299	70.9	7	25.9	24	33.8
After 1976	36	8.5	1	3.7	0	0.0
Total	422		27		71	

3.1.4 Trainee Citizenship Status

As shown in Table 3-4, over 90 percent of all trainees were U.S. citizens at the time of the survey; all graduate students were U.S. citizens.

Table 3-4

Trainee Citizenship

Citizenship Status	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Citizen	347	94.3	25	100.0	52	96.3
Noncitizen National/ Permanent Resident	21	5.7	0	0.0	2	3.7
Total	368		25		54	

3.1.5 Trainee Attendance at Historically Black Colleges and Universities

Table *3-5* presents the number of trainees who reported that their home institution was an Historically Black College or University (HBCU). As reflected in the table, about one-third of both the undergraduate and graduate students attended an HBCU prior to STMSP participation and about 12 percent of the health professional students reported having attended an HBCU.

Table 3-5

Trainee Attendance at Historically Black Colleges and Universities

HBCU Attendance	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Attended HBCU	130	32.7	8	30.8	7	11.7
Did Not Attend HBCU	268	67.3	18	69.2	53	88.3
Total	398		26		60	

3.1.6 Grade Point Average

Trainees were asked what their grade point averages (GPAs) were when they began STMSP participation. As shown in Table 3-6, half of the undergraduate students had GPAs between 3.6 and 4.0 and over half of the graduate students had GPAs between 3.1 and 3.5. About 2 percent of the undergraduate students and none of the graduate or health professional

students had GPAs below 2.6. Moreover, while the bulk of the GPAs for health professional students also fell within the 3.1 to 4.0 range, 36 percent of these trainees were on a pass/fail system.

Table 3-6

GPA of Trainees Prior to STMSP Participation

Range of GPAs	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Pass/Fail	14	3.0	5	16.1	27	36.5
2.0=2.5	9	2.0	0	0.0	0	0.0
26=30	34	7.4	4	12.9	4	5.4
31=35	172	37.4	18	58.1	20	27.0
3 6 =4.0	231	50.2	4	12.9	23	31.1
Total	460		31		74	

3.1.7 Trainees' Majors at Time of STMSP Application

Trainees were asked what they were majoring in when they applied to the STMSP. A majority of undergraduate students (69 percent) were majoring in the biological sciences. The physical sciences were mentioned by 9 percent of the undergraduate students; the other most frequently mentioned majors were health sciences and social sciences. Half of the graduate students were majoring in biological sciences, and over one-third in the health sciences. This pattern was reversed for the health professional students—a majority were majoring in the health sciences, followed by the biological sciences. These findings are summarized in Table 3-7.

Table 3-7

Trainees' Majors Before STMSP Participation

Major	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Agriculture	2	0.4	0	0.0	0	0.0
Biological Sciences	313	69.1	15	50.0	21	27.6
Education	8	1.8	1	3.3	0	0.0
Engineering	11	2.4	1	3.3	0	0.0
Mathematical Sciences	7	1.5	0	0.0	0	0.0
Physical Sciences	41	9.1	1	3.3	2	2.6
Social Sciences	23	5.1	1	3.3	3	3.9
Health Sciences	37	8.2	11	36.7	48	63.2
Arts and Humanities	2	0.4	0	0.0	0	0.0
Other[1]	9	2.0	0	0.0	2	2.6
Total	**453**		**30**		**76**	

3.1.8 Trainees' Career Interests When Applying to the STMSP

Table 3-8 reports the trainees' tareer status/interest when they first leamed of the STMSP. Although approximately 40 percent of all trainees were already pursuing degrees in the biomedical sciences, fewer were considering a career in the biomedical sciences or a research-oriented program or career. For example, although more than half of the graduate students reported interest in a research career, this was not the case for undergraduate or health professional students. About one-third of undergraduate and health professional students reported that they had been considering a research-oriented program or career. Furthermore, 11 percent of the undergraduate students had given little or no thought to a research career, while 4 percent or less of graduate and health professional students fell within this category. The trainees who fell within the "other" category indicated that they were considering careers as either physicians, teachers, or nurses, or were undecided about their career goals when they leamed of the STMSP.

[1] This category included disciplines such as law, social work, or other fields not included on the Academic Major and Employment Speciality list provided by KRA.

Table 3-8

Status of Trainees' CareerlInterest Upon Learning of the STMSP

Career StatuslInterest	Trainee Status					
	Undergraduate		Graduate		f Health Professional	
	Number	Percent	j_Number_J	Percent	Number	Percent
Pursuing a Degree in the Biomedical Sciences	195	41.5	13	41.9	30	39.0
Considering a Career in the Biomedical Sciences	163	34.7	7	22.6	10	13.0
Considering a Research-Oriented Program or Career	140	29.8	16	51.6	21	27.3
Giving Little or No Thought to a Research Career	51	10.9	1	3.2	3	3.9
Other	**31**	**6.6**	**2**	**6.5**	**9**	**11.7**
Total	**470**		**31**		**77**	

3.2 Trainee Participation in the STMSP

3.2.1 How Students Learned About the Program

To form recruitment strategies, it is useful to know how the trainees leamed about the existence of the program. As shown in Table 3-9, the primary source of information about the STMSP for undergraduate and health professional students was announcements posted at their home institution. The second most common source for these students was a professor at their home institution. However, among graduate students, posted announcements and a professor at their institution were rated equally as the primary source of information about the program. For undergraduate students, another major source of information about the program was other students (14 percent), who had probably heard of the program through announcements or their professors. In addition, 19 percent of undergraduate and graduate students and 7 percent of the health professional students indicated that they leamed about the program from "other" sources. These sources included STMSP staff, relatives, the Intemet, advertisements, other programs, and the placement office at their home institution.

Table 3-9

Sources of Information About the Program

How Trainee Learned About STMSP	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number_J_Percent		Number	Percent	Number	Percent
Announcement Posted at Home Institution	184	39.1	10	32.3	34	47.9
Attendance at Professional Conference or Seminar	30	6.4	1	3.2	0	0.0
Professor at Home Institution	91	19.4	10	32.3	15	21.1
Recruiter Visited Home Institution	11	2.3	3	9.7	0	0.0
From Another Student	64	13.6	3	9.7	6	8.5
Other	91	19.4	6	19.4	5	7.0
Total	470		31		71	

3.2.2 Most Recent Year of Participation in the STMSP

Trainees were asked for the year they began participating in the STMSP. As shown in Table 3-10, during the early years of the program, that is between 1991 and 1993, 16 percent of the undergraduate students, 17 percent of the graduate students, and 14 percent of the health professional students participated in the program. However, the table also indicates that as the program progressed, the trainee population increased steadily, presumably as more individuals became aware of its existence and the number of STMSP grantees expanded. For instance, by 1996 participation had increased to 48 percent for the undergraduate students, 54 percent for the graduate students, and 45 percent for the health professional students.

Table 3-10

Year Trainee Began Participating in the STMSP

Year of Participation	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
1991	**5**	**1.4**	**2**	**8.3**	**0**	**0.0**
1992	13	3.7	0	0.0	1	**2.0**
1993	37	10.5	**2**	**8.3**	**6**	**11.8**
1994	57	16.2	4	16.7	10	19.6
1995	70	19.9	3	12.5	11	21.6
1996	169	48.1	13	54.2	23	45.1
Total	**351**		**24**		**51**	

3.2.3 Institution at Which Trainee Participated in the STMSP

Trainees were asked where their STMSP research experience took place. As shown in Table 3-1 1, the largest group of trainees, 56 percent, participated in the program at their home institution, while 20 percent participated in the program at a location other than their home institution. Approximately 14 percent participated in the program at a hospital or clinic not associated with their home institution, while 5 percent participated in similar facilities that were associated with their home institution. Also, 3 percent participated in programs at an independent research laboratory not affiliated with their home institution, while 2 percent indicated that they participated in the program at other locations such as an independent research laboratory affiliated with their home institution.

Table 3-11

Location of STMSP Program

Location	Number	Percent
Home Institution	260	55.7
Other Than Home Institution	92	19.7
Hospital or Clinic Not Associated With Home Institution	66	14.1
Hospital or Clinic Associated With Home Institution	23	4.9
Research Laboratory Not Associated With Home Institution	16	3.4
Other	10	2.1
Total	**467**	

3.3 Trainees' Research Projects

3.3.1 Area of STMSP Research Experience

Trainees were asked to identify the primary program (or disease) area of their STMSP research experience. As shown in Table 3-12, one-third of the trainees in each student category listed cardiovascular disease as their primary area of STMSP research. Hematologic research was listed as the second most common experience by both undergraduate and graduate students (21 and 17 percent, respectively), while pulmonary disease (23 percent) was listed as the next most common research experience for health professional students. It should also be noted that approximately 6 percent of the undergraduate students, 7 percent of the graduate students, and 4 percent of the health professional students indicated that their research experiences focused on "multiple areas" or a combination of cardiovascular, hematologic. or pulmonary disease. Further. 28 percent of undergraduate students, 33 percent of graduate students, and 25 percent of health professional students indicated that they had "other" research experiences in areas such as immunology, genetics, or pharmacology.

Table 3-12

Trainee Research Areas

Research Area	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	j_Number	[Percent	Number	[Percent	Number	Percent
Cardiovascular	151	33.4	10	33.3	25	34.2
Hematologic	93	20.6	5	16.7	10	13.7
Pulmonary	52	11.5	3	10.0	17	23.3
Multiple Areas	27	6.0	2	6.7	3	4.1
Other	129	28.5	10	33.3	18	24.7
Total	452		30		73	

3.3.2 Trainee Involvement in Choosing Their Research Project

Respondents were asked about the extent to which they were involved in choosing their STMSP research project. The level of involvement is shown in Table 3-13.

Table 3-13

Involvement in Choice of Research Project

Involvement	Number	Percent
Very Involved	154	33.3
Somewhat Involved	179	38.7
Not Very Involved	73	15.8
Not Involved at All	57	12.3
Total	**463**	

More than 30 percent of the trainees indicated that they were very involved in the selection of the research project they worked on while participating in STMSP. Almost 40 percent indicated that they were somewhat involved in the selection process. The remaining 28 percent indicated that they were not very involved or not at all involved in the selection of their research assignment. This lack of involvement is reflected in the suggestions for changes to the program discussed in Section 3.3.4.

3.3.3 Trainees' Satisfaction With Research Project Assignment

Respondents were asked to indicate their level of satisfaction with their research project assignments. As shown in Table 3-14, the majority said that they were "very satisfied" or "somewhat satisfied" with their research project assignments. Undergraduate and health professional students' responses were divided almost evenly between these two categories. while nearly 10 percent more of the graduate students reported being "very satisfied" *(52* percent) with their research project assignments.

Table 3-14

Satisfaction With STMSP Research Project Assignment

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	189	41.6	15	51.7	31	41.9
Somewhat Satisfied	196	43.2	12	41.4	32	43.2
Somewhat Dissatisfied	55	12.1	2	6.9	9	12.2
Very Dissatisfied	14	3.1	0	0.0	2	2.7
Total	**454**		**29**		**74**	

3.3.4 Trainees' Suggestions for Changes in Research Project Assignments

Trainees were asked if they had any suggestions for the research project assignments. As shown in Table 3-15 below, the suggestions for changes in the program centered around 1) their mentors, 2) specific characteristics of the research project, 3) choice of research project, and 4) specific STMSP components or processes, such as recruitment or selection.

Table 3-15

Trainees' Suggestions for Changes in Research Project Assignments

Mentors|Research Staff
Supply list of mentors and projects to students prior to their entering the program
Have students interview with prospective mentors prior to participation in the program
Allow more time with primary investigator rather than with lab technician/research associate
Get more minority mentors
Give students greater initial and continuing involvement with mentors
Project Characteristics
Increase length of program
Shorten length of assignments
Provide more time in laboratory
Provide more background materials
Expose students to more laboratory techniques
Have more students in the program
Provide more/better laboratory equipment
Choice of Research Project
Provide greater choice of research projects
Involve students more in choosing projects
Make a better match of project to interest and ability of the student
Focus projects more
STMSP Processes
Establish better communication among staff about length and focus of assignments
Inform students of acceptance to program/assignment sooner
Provide more time to socialize with other participants
Have seminars to inform others of students research
Make opportunities available for students to publish

3.4 Trainees' STMSP Monitor, Staff, and Resources

3.4.1 Program Monitor

Respondents were asked who was responsible for monitoring their STMSP research project. The questionnaire listed three choices—the STMSP program director, an assigned mentor, and the director of the research project. An "other" category was also provided. As shown in Table 3-16, an assigned mentor was mentioned most frequently by all three trainee categories. The director of the research project in which the trainees worked was the next most frequently mentioned in all three trainee categories. Less than 10 percent of the students in each category were supervised by someone other than the choices offered in the questionnaire. In these few cases, a graduate student or laboratory technician monitored the trainee's research.

Table 3-16

Type of STMSP Monitor

Type of Program Monitor	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
STMSP Program Director	**33**	**8.8**	**1**	**4.0**	**4**	**7.5**
Assigned Mentor	267	71.4	18	72.0	34	64.2
Director of Research Project	58	15.5	4	16.0	10	18.9
Graduate Student	14	3.7	2	8.0	5	9.4
Laboratory Technician	2	0.5	0	0.0	0	0.0
Total	**374**		**25**		**53**	

3.4.2 Extent of Trainee Monitoring

Trainees were asked to what extent their role in conducting the STMSP research was monitored. Responses are presented in Table 3-17. Almost 95 percent of all trainees indicated that their role in the research project was monitored "to a great extent" or "to some extent," with almost 60 percent of students in each category (more in the health professions) stating "to a great extent." None of the graduate students and approximately 6 percent of the undergraduate and health professional students indicated that they were monitored "very little" or "not at all." It would appear that monitoring of the research assignments of trainees was more than adequate.

Table 3-17

Extent of Trainee Monitoring

Extent of Trainee Monitoring	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	(Percent	Number	Percent
Great Extent	219	57.6	15	57.7	34	84.2
Some Extent	138	36.3	11	42.3	16	30.2
Very Little	21	5.5	0	0.0	3	5.7
NotatAll	2	0.5	0	0.0	0	0.0
Total	**380**		**26**		**53**	

3.4.3 Trainees' Suggestions for Changes in STMSP Monitoring and Support

Trainees' suggestions for changes in STMSP monitoring and support fall generally into three areas: their mentors, project characteristics, and STMSP processes. Although one trainee suggested less monitoring, comments indicating a need for more monitoring and interaction with mentors and research staff were more common. Table 3-18 lists the trainees' suggestions.

Table 3-18

Trainees' Suggestions for Changes in STMSP Monitoring and Support

Mentors/Research Staff
Give greater initial and continuing involvement with mentors
Secure greater commitment of staff
Create a better match of mentors and students
Increase interaction with minority scientists
Increase involvement of STMSP director
Project Characteristics
Supply students with background materials for their projects
Increase hands-on research
Increase the number of seminars
Processes
Instill greater interaction with other students, staff, and overall department
Decrease ratio of students to mentors
Provide weekly status reports from mentors
Monitor progress more frequently
Use less monitoring
Provide career counseling/guidance:
Provide constructive feedback
Clarify expectations
Clarify who the mentor is

3.4.4 Trainee Contacts With STMSP Staff

Information was obtained on the type and frequency of contacts between the trainee and program staff. Four types of communication were listed in the questionnaire, as shown in Table 3-19. Informal verbal communication was the most common contact between the trainees and the program staff concerning their research assignment, with 74 percent mentioning this form as being used sometimes or often. Fifty percent reported that formal scheduled meetings were used sometimes or often. About 45 percent of the trainees reported that informal written notes from STMSP staff were seldom or never used; 51 percent stated that formal written exchanges were seldom or never used. Written feedback (formal or

informal) was mentioned by trainees as being used often by less than 20 percent of the trainees.

Table 3-19

Type and Frequency of Trainee and Program Staff Contacts

Type of Contact	Frequency of Contact							
	Never		Seldom		Sometimes		Often	
	N		N	%	N	%	N	%
Informal Verbal Conversation	5	0.8	16	2.7	84	14.2	354	59.8
Formal Scheduled Meetings	60	10.1	88	14.9	151	25.5	149	25.2
Informal Written Notes	159	26.9	93	15.7	110	18.6	70	11.8
Formal Written Exchange	201	34.0	102	17.2	83	14.0	39	6.6
Other Communication	34	5.7	3	0.5	8	1.4	14	2.4
Total	**592**		**592**		**592**		**592**	

3.4.5 Frequency of Contact With Program Staff

Another measure of program contact is the frequency of one-on-one contacts between the trainees and various program staff. Relatively little contact between trainees and program staff would be a source of concern. However, as shown in Table 3-20, trainees had frequent contacts with program staff.

Table 3-20

Frequency of Trainee Contacts With Specific Program Staff

Number of Weekly Contacts	Type of Program Staff							
	Mentor		Director		Research Faculty/Staff		Other Faculty/Staff	
	N		N		N		N	
None	6	1.0	103	17.4	70	11.8	0	0.0
1-2 Times	92	15.5	237	40.0	176	29.7	137	23.1
3-4 Times	81	13.7	68	11.5	88	14.9	78	13.2
More Than 4 Times	275	46.5	52	8.8	119	20.1	137	23.1
Total	592		592		592		592	

Not surprisingly, the most frequent contacts were with the trainee&s mentor. Sixty percent of the trainees reported three or more contacts with their mentor each week. One percent of the trainees reported no weekly contact with their mentors. Forty percent of the trainees indicated at least weekly contact with the program director, and twenty percent indicated three or more contacts with the program director.

Trainees also reported frequent contacts with research faculty and staff. About 12 percent of the trainees reported no weekly contact with research faculty and staff. More than one-third indicated an average of three or more weekly contacts with STMSP research staff. About 23 percent indicated an average of more than four contacts with other research faculty and staff in the course of one week; none indicated having no contacts with such staff. It appears that ample opportunity was provided for trainees to have weekly contact with members of the STMSP staff.

3.4.6 Nature of Contact With Program Staff

Respondents were also asked about the nature of their contact with program staff. If much of the contact described in the previous section was of a trivial nature, this would be a source of concern. However, trainees' contact with staff involved the discussion of substantive issues, such as the availability of research positions, pursuit of an area of specialization. potential career paths, educational requirements, and recognition and compensation associated with research careers. Table 3-21 presents the proportion of trainees who responded that they had discussed these areas with STMSP faculty/staff.

A higher proportion of undergraduate students (50 percent), compared to graduate students or students in health professional fields (about one-third), had contacts with program staff regarding the availability of positions in health research. Undergraduate and graduate students reported more contacts with program staff than did health professional students in the four other areas—over half of these students had discussed these areas with staff, while less than half of the health professional students reported such discussions. In summary, it would appear that trainees had ample opportunity to use—and did use—the program to explore opportunities in the biomedical and behavioral research fields.

Table 3-21

Areas Trainee Discussed With Program Staff

Nature of Contacts	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	N	1%INJ%			N	1%
Availability of Research Positions	236	50.2	12	38.7	26	33.8
Pursuit of a Specialization	251	53.4	18	58.1	37	48.1
Pursuing Multiple Career Paths	275	58.5	16	51.6	35	45.5
Requirements for Biomedical Careers	314	66.8	17	54.8	35	45.5
Recognition and Compensation from a Research Career	283	60.2	17	54.8	35	45.5
Total	**470**		**31**		**77**	

3.4.7 Academic Resources Available

Respondents were also asked about the enrichment and research activities provided as part of the STMSP. The number of trainees reporting availability of the various academic resources is presented in Table 3-22.

Table 3-22

Availability of Academic Resources to STMSP Trainees

Academic Resources	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Research Forums	334	71.1	22	71.0	38	49.4
Special Courses	78	16.6	6	19.4	10	13.0
Student Presentations	327	69.6	24	77.4	36	46.8
Workshops	134	28.5	12	38.7	15	19.5
GRE Preparation	91	19.4	7	22.6	10	13.0
Individual Tutoring	61	13.0	8	25.8	11	14.3
Social Activities	278	59.1	18	58.1	33	42.9
Other Activities	12	2.6	2	6.5	1	1.3
Total	470		31		77	

Research forums and student presentations were the most common activities for all three groups of trainees. Seventy percent of both undergraduate and graduate students reported having these activities, compared to approximately *50* percent of the health professional students. Social activities were the next most frequently mentioned activity for all three trainee groups. About one- to two-fifths of the students had access to workshops of one type or another. This proportion was highest for undergraduate students and lowest for health professional students. Fewer than one in five of any of the students at each academic level had access to special courses as a part of their research expenence.

Availability of GRE preparation or graduate school counseling was lowest for health professional students (13 percent) and somewhat more available to undergraduate students **(19** percent) and graduate students (23 percent). Individual tutoring followed a similar pattern with the highest proportion (26 percent) being available to graduate students, but slightly more health professional students (14 percent) had access to this activity than undergraduate students (13 percent).

Almost all trainees indicated the availability of other activities during their program participation. They included independent work, group meetings, and presentations at national conferences.

3.5 Trainee Assessment of STMSP

3.5.1 STMSP Effect on Career Decisions

Trainees were asked whether the STMSP had any direct impact on their decision in the four career-related areas listed in Table 3-23 below. Seventy-two percent of the undergraduate students indicated that the STMSP affected their career choice. The same response was given by about half of the graduate and health professional students.

Table 3-23

Effects of STMSP on Career Decisions

Career Decision	Trainee Status: Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Career Choice	337	71.7	17	54.8	37	48.1
Area of Specialization	195	41.5	14	45.2	30	39.0
Employment Choice	221	47.0	14	45.2	23	29.9
Graduate Training	254	54.0	16	51.6	24	31.2
Total	470		31		77	

About half of the undergraduate and graduate students indicated that the program affected their career decision regarding graduate training, while only 31 percent of the health

professional students said that their decision regarding graduate training was affected by their participation in the STMSP.

Forty-one percent of the undergraduate students indicated that the STMSP program had an impact on their choice of area of specialization. Among the graduate students, the proportion was slightly higher *(45* percent). A higher proportion of the health professional students indicated that the training program affected their choice of specialization (39 percent) than indicated that it affected their choice of graduate training (31 percent).

Almost half (47 percent) of the undergraduate students who participated in the STMSP indicated that the program affected their choices regarding employment as did *45* percent of the graduate students and 30 percent of the health professional students. The questionnaire did not ask how it affected their employment decisions—we can only assume that it encouraged them to pursue employment in the biomedical and behavioral research areas. This is explored in the next section that addresses post-program career choices.

3.5.2 Trainee Satisfaction

Trainee responses to questions regarding their satisfaction with the STMSP program were overwhelmingly positive. Few students indicated dissatisfaction with any component of their programs.

Research Training—Trainees were asked to indicate their satisfaction with the research training provided as a part of the STMSP. The satisfaction levels of each trainee group are presented in Table 3-24. Almost two-thirds of the trainees were very satisfied with the research training. Almost 90 percent of the undergraduate and health professional students and all of the graduate students were either very satisfied or somewhat satisfied with this program aspect. Less than 5 percent of the undergraduate students and 9 percent of the health professional students were somewhat dissatisfied with this aspect of the program and less than 2 percent indicated that they were very dissatisfied with the research training. Research training received the highest satisfaction rating of any program aspect.

Table 3-24

Trainee Satisfaction With Research Training

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	305	66.6	**21**	**72.4**	46	60.5
Somewhat Satisfied	127	27.7	8	27.6	22	28.9
Somewhat Dissatisfied	19	4.1	0	0.0	7	9.2
Very Dissatisfied	7	1.5	0	0.0	1	1.3
Total	**458**		**29**		**76**	

Trainee Satisfaction With Research Assignment Process—One crucial question for the assessment of the STMSP is the level of trainee satisfaction with the manner in which their research projects were assigned. As shown in Table 3-25, the majority of trainees expressed a very high level of satisfaction with the research assignment process—more than 90 percent of the undergraduate and health professional students and all of the graduate students were very or somewhat satisfied. Only six trainees, all of whom were undergraduate students, said they were very dissatisfied.

Table 3-25

Trainee Satisfaction With Research Assignment Process

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	248	65.4	22	84.6	37	69.8
Somewhat Satisfied	106	28.0	4	15.4	11	20.8
Somewhat Dissatisfied	19	5.0	0	0.0	5	9.4
Very Dissatisfied	6	1.6	0	0.0	0	0.0
Total	**379**		**26**		**53**	

Trainee Satisfaction With Research Facility/Equipment—Trainees were asked to express their satisfaction with the research facility and equipment available to them through the program. As shown in Table 3-26, over 90 percent of all trainees were satisfied or very satisfied with the facilities and equipment available to them through the program and over

70 percent were very satisfied with this aspect of the program. Only five trainees indicated that they were very dissatisfied with this aspect of the research training program.

Table 3-26

Trainee Satisfaction With Research Facility and Equipment

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	338	74.0	23	79.3	55	72.4
Somewhat Satisfied	99	21.7	5	17.2	16	21.1
Somewhat Dissatisfied	17	3.7	1	3.4	3	3.9
Very Dissatisfied	3	0.7	0	0.0	2	2.6
Total	457		29		76	

Mentoring Relationships—Sixty percent of the students in each group were very satisfied with their mentoring relationships while in the program—the interaction with their assigned program mentor. About one-fourth of the undergraduate students and about one-third of both the graduate and health professional students indicated that they were somewhat satisfied with their relationship to their mentor. Only 12 trainees indicated that they were very dissatisfied with their program mentor. This aspect of the program would have to be judged very satisfactory, although, as will be seen later in Table 3-37. a number of trainees, particularly undergraduate students, suggested some change in the assignment of mentors and the nature of the interaction with them.

Table 3-27

Trainee Satisfaction With Mentoring Relationships

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	282	62.1	18	62.1	46	61.3
Somewhat Satisfied	110	24.2	9	31.0	21	28.0
Somewhat Dissatisfied	51	11.2	2	6.9	7	9.3
Very Dissatisfied	11	2.4	0	0.0	1	1.3
Total	454		29		75	

Trainee Satisfaction With Exposure to Research Career Opportunities—As shown in Table 3-28, more than 85 percent of the undergraduate and health professional students and 71 percent of the graduate students were "very satisfied" or "somewhat satisfied" with the exposure the STMSP provided to research career opportunities. About one-half of undergraduate and health professional students were "very satisfied" with the career exposure they received as participants in the program, compared to 21 percent of the graduate students. Approximately 13 percent of the undergraduate and health professional students were either somewhat or very dissatisfied with this aspect of the program. However, almost 30 percent of the graduate students stated they were somewhat dissatisfied with their exposure to research career opportunities while in the program.

Table 3-28

Trainee Satisfaction With Exposure to Research Career Opportunities

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	**Percent**	**Number**	**Percent**	**Number**	**[Percent.**
Very Satisfied	236	51.6	6	21.4	**37**	**50.7**
Somewhat Satisfied	164	35.9	14	50.0	26	35.6
Somewhat Dissatisfied	48	10.5	8	28.6	8	11.0
Very Dissatisfied	9	2.0	0	0.0	2	2.7
Total	457		**28**		**73**	

Trainee Satisfaction With Guidance and Counseling—At least 80 percent of the trainees at each academic level were "very satisfied" or "fairly satisfied" with the guidance and counseling they received while in the program. However, 14 percent of the undergraduate and graduate students, and 21 percent of the health professional students were somewhat or very dissatisfied with the guidance and counseling offered as a part of the STMSP. The specific results of the findings for this aspect of trainee satisfaction are shown in Table 3-29.

Table 3-29

Trainee Satisfaction With Guidance and Counseling

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	202	44.6	15	51.7	32	43.2
Somewhat Satisfied	189	41.7	10	34.5	27	36.5
Somewhat Dissatisfied	54	***11.9***	4	13.8	13	17.6
Very Dissatisfied	8	1.8	0	0.0	2	2.7
Total	**453**		**29**		**74**	

Trainee Satisfaction With Stipend Amount—There was somewhat less satisfaction with the amount of the stipend support provided as a part of the program. Forty-seven percent of the undergraduate students, 45 percent of the graduate students and 38 percent of the health professional students were very satisfied with the amount of the STMSP stipend. Relatively few in each group of trainees were very dissatisfied with the amount of their stipend. However, 10 percent of the undergraduate students, 16 percent of the health professional students, and 21 percent of the graduate students were somewhat dissatisfied with the stipend provided by the program, as shown in Table 3-30.

Table 3-30

Trainee Satisfaction With Stipend Amount

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	217	47.3	13	44.8	28	37.8
Somewhat Satisfied	185	40.3	9	31.0	30	40.5
Somewhat Dissatisfied	48	10.5	6	20.7	12	16.2
Very Dissatisfied	9	2.0	1	3.4	4	5.4
Total	**459**		**29**		**74**	

Enrichment Activities—Trainees were also asked to express their level of satisfaction with the enrichment activities provided by the institution as a part of the STMSP. These activities included research seminars, bag lunches. opportunities to participate in seminars or present papers at graduate student gatherings as well as social activities attached to the research program. These activities were provided by the institution to augment the research aspect of the STMSP and may have been part of larger university/medical institution activities or activities particular to the STMSP (such as field trips or lunches and seminars for all STMSP trainees).

As shown in Table 3-31, there was general satisfaction with the enrichment activities provided as a part of the overall program. About 80 percent of the trainees in each group expressed some or great satisfaction with this aspect of the program. The greatest dissatisfaction (20 percent) was indicated by the graduate students. In general, program participants were satisfied with the enrichment activities provided as part of the STMSP experience.

Table 3-31

Trainee Satisfaction With Enrichment Activities

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	194	43.5	13	44.8	33	**48.5**
Somewhat Satisfied	175	39.2	10	34.5	24	35.3
Somewhat Dissatisfied	62	13.9	3	10.3	9	13.2
Very Dissatisfied	15	34	3	10.3	2	2.9
Total	**446**		**29**		**68**	

Opportunities for Publication—Opportunities for publication provided as a part of the STMSP received lower satisfaction rankings by each group of trainees. Approximately 35 percent of the undergraduate and health professional students and 44 percent of the graduate students were less than satisfied with this aspect of the program. It is not surprising that graduate students were less satisfied with this aspect of the STMSP, since these students were probably enrolled in programs where opportunities to publish are very crucial. These results are presented in Table 3-32.

Table 3-32

Trainee Satisfaction With Opportunities for Publication

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	116	29.7	5	20.0	19	29.7
Somewhat Satisfied	142	36.3	9	36.0	22	34.4
Somewhat Dissatisfied	96	24.6	8	32.0	18	28.1
Very Dissatisfied	37	9.5	3	12.0	5	7.8
Total	**391**		**25**		**64**	

3.5.3 Rankings of Determinants of Satisfaction

Trainees were also asked to rank each of the nine aspects of satisfaction discussed above from 1 (the highest) to 9 (the lowest) with regard to their importance in determining the level of overall satisfaction with the program. These rankings are presented in Exhibit 3-1. The rankings are the weighted average of the rankings provided by each group of students.

The research training provided as a part of the STMSP received the highest ranking in determining the degree of satisfaction among all three groups of trainees. Mentoring relationships received the second highest satisfaction ranking by all three trainee groups. Exposure to research career opportunities received the third highest ranking of satisfaction by all groups. This is consistent with the program objective of providing research experience and exposure to trainees potentially interested in research careers in the biomedical and behavioral sciences and making them aware of the potential for a research career in these fields.

Generally lower rankings of importance in determining program satisfaction were given to guidance and career counseling, research facilities and equipment provided as a part of the program, and the process by which trainees were assigned to particular research projects, in that order. The satisfaction levels with the research assignment process discussed earlier and the importance of this area as indicated by the suggestions for changes in the program may require some attention to this aspect of the program.

The lowest rankings of importance to satisfaction with the program were given to the amount of the stipend provided by the program, the availability of enrichment activities as a part of the research experience. and the potential for publications as a result of the research experience provided. This is, to some extent, to be expected since enrichment activities and

Exhibit 3-1

Ranking of Satisfaction With Aspects of STMSP Experience

Program Aspect	Undergraduate	Graduate	Health Professional
Research Training	1	1	1
Mentoring Relationships	2	2	2
Exposure to Research Career Opportunities	3	3	3
Guidance and Counseling	4	4.5	4
Research Facility/Equipment	5	4.5	5
Research Assignment Process	6	7	6
Stipend Amount	7	6	8.5
Enrichment Activities	8	8	8.5
Opportunities for Publication	9	9	7

opportunities for publication may be (and seem to be) considered ancillary to the basic purpose of the STMSP.

Of particular interest in this regard is the relative ranking of the amount of the research stipend. As noted previously, there was general satisfaction with the amount of the research stipend provided as a part of the program, yet this was one of the major areas for suggestions for change. This seeming contradiction could be explained by the lower ranking given to the amount of the stipend as a ~measure of importance in determining overall program satisfaction. Trainees may be less satisfied with the amount of their stipends but consider this of lower importance in determining their satisfaction with their research experience in the STMSP.

3.5.4 Trainee Satisfaction With Feedback on Their STMSP Research Experience

Trainees were asked about their satisfaction with three areas of the feedback they received regarding their STMSP research experience: the amount of feedback, the level of support received, and the frequency of contact with research faculty/staff.

Satisfaction With the Amount of Feedback Trainee Received—In contrast to satisfaction with research career exposure, 100 percent of the graduate students were "very satisfied" or "fairly satisfied" with the feedback they received as a part of the research program. The same was true for 90 percent of the undergraduate students and 87 percent of the health professional students. However, 13 percent of the health professional students and almost

10 percent of the undergraduate students indicated some dissatisfaction with the feedback they received. These results are presented in Table 3-33.

Table 3-33

Trainee Satisfaction With Feedback

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Very Satisfied	241	84.4	19	76.0	33	61.1
Somewhat Satisfied	97	25.9	6	24.0	14	25.9
Somewhat Dissatisfied	33	8.8	0	0.0	6	11.1
Very Dissatisfied	3	0.8	0	0.0	1	1.9
Total	374		25		54	

Trainee Satisfaction With the Level of Support in Carrying Out Research—Again, the graduate students in the STMSP were 100 percent satisfied with the level of support, i.e., both financial and academic, provided by the program—indeed, 79 percent were "very satisfied," as shown in Table 3-34. Undergraduate and health professional students also expressed satisfaction with program support—91 percent and 89 percent, respectively. Again, there was some indication of dissatisfaction among the undergraduate students (9 percent) and the health professional students (11 percent) with the stipends and other support provided by the program.

Table 3-34

Trainee Satisfaction With Level of Support

Level of Satisfaction	Trainee_Status					
	Undergraduate		Graduate		Health Professional	
	Number		Number		Number	
Very Satisfied	241	64.4	19	79.2	38	70.4
Somewhat Satisfied	102	27.3	5	20.8	10	18.5
Somewhat Dissatisfied	21	5.6	0	0.0	6	11.1
Very Dissatisfied	10	2.7	0	0.0	0	0.0
Total	**374**		**24**		**54**	

Satisfaction With the Frequency of Contact With Research Faculty/Staff—In general. as shown in Table 3-35, students in each category were satisfied with the frequency of contact with research faculty and staff while in the program. At least 90 percent of students in each category were "somewhat satisfied" or "very satisfied" with the amount of contact they had with members of the research faculty/staff. No graduate students expressed dissatisfaction. and only about 10 percent of undergraduate and health professional students noted dissatisfaction with faculty contacts.

Table 3-35

Trainee Satisfaction With Research Faculty Contact

Level of Satisfaction	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	J	Number	J Percent
Very Satisfied	271	72.5	20	83.3	41	75.9
Somewhat Satisfied	67	17.9	4	16.7	8	14.8
Somewhat Dissatisfied	27	7.2	0	0.0	5	9.3
Very Dissatisfied	9	2.4	0	0.0	0	0.0
Total	374		24		54	

3.5.5 Areas in Which Trainees Suggested Changes

Respondents were asked to make suggestions for program improvements in the six categories listed in Table 3-36.

The changes suggested most frequently for program improvements by all trainees were related to opportunities for publication, the level of mentor involvement, and the stipend amount. Approximately one-third of trainees in each group felt that there should be more opportunities for publication. About one-third of the undergraduate and graduate students also indicated that there should be more mentor involvement, yet fewer health professional students (26 percent) recommended changes in this area. Similarly, over 40 percent of the graduate students suggested that changes needed to be made in the level of the stipend offered, while 28 percent of the undergraduate students and 32 percent of the health professional students suggested changes in the stipends.

The suggestions offered by trainees are listed in Table 3-37.

Table 3-36

Trainee Suggestions for Improvements to the STMSP

Areas for Suggested Improvements in the STMSP	Trainee Status: Undergraduate		aduate		Health Professional	
	Nj	~	{Gr		N]	%
Recruitment and Selection Process	87	18.5	6	19.4	19	24.7
Level of Mentor Involvement	142	30.2	9	29.0	20	26.0
Research Experience	109	23.2	8	25.8	18	23.4
Opportunities for Publication	145	30.9	10	32.3	24	31.2
Stipend Amount	134	28.5	13	41.9	25	32.5
Activities to Help Trainee Feel a Part of the Research Institution	100	21.3	5	16.1	18	23.4
Other	88	18.7	5	18.1	16	20.8
Total	470		31		77	

Table 3-37

Changes Suggested by Trainees

Suggested Changes	Total]
Recruitment and Selection Process	**113**
Increase recruitment and advertising for the program Clarify eligibility for acceptance into an STMSP program Provide greater clarity about areas of research available Target smaller institutions Select students with an interest in research Select more Hispanics Select students with diverse academic backgrounds Filter out less serious applicants with an interview process	
Level of Mentor Involvement	**173**
Insure greater initial and continuing involvement and commitment to students Provide students with the option to change mentors Have more minority mentors Provide multiple mentors Make better matches Give mentors financial assistance Hire additional researchers in order to offer a wider array of research topics	

Table 3-37

Changes Suggested by Trainees (Cont'd)

Research Experience	**136**
Provide more choice in projects Offer more structured projects Provide exposure to a wider area of science Add workshops on laboratory techniques State expectations of student/program more clearly Provide longer program Provide opportunity to continue research after program ends	
Opportunities for Publication	181
Teach students the process of publishing research Increase opportunities for students to publish Begin a publication for the STMSP research Produce a publication of students' research Extend time to do publications Notify students of publication and acknowledge contribution	
Stipend Amount	177
Keep stipend consistent throughout program Have stipend correspond with set number of hours worked Set amount of stipend based on experience Set stipend based on number of dependents Have stipend correspond to level of education Refrain from deducting housing/meals from stipend Refrain from taking taxes out of stipend Increase funds Increase funds for nonresearch-related activities Handle stipend monies more efficiently Ensure stipend amount is the same as what is stated on application	
Activities Designed to Help Trainee Feel Part of the Research Institution	**124**
Add orientation workshop Increase activities Provide contact with other students, mentors, labs at other institutions Have seminars to present research Have socials, newsletters, presentations Increase involvement of director Evaluate student progress more frequently Plan a reunion for all participants and their mentors	
Other Suggestions (Not Included in the Above Categories)	**43**
Discuss various job opportunities in field Provide housing (other than dorm) Offer counseling on graduate school entrance examinations Make opportunity available to more students	

3.6 Postparticipation Educational Status and Career Interests

This section provides information on the educational status of the trainees at the time of the survey and their career interests. This information is descriptive rather than comparative. Comparisons to program applicants will be analyzed in a subsequent section.

3.6.1 Trainees' Highest Level of Education

Trainees were asked about their current level of education (i.e., at the time of the survey) as compared to their level of education when they began the program. It should be noted that. while for some trainees, this may be up to 4 years after their participation in the STMSP, for the majority not much time had elapsed between their participation in the program and the subsequent followup. The reader should refer to the distribution of the year of participation shown in Table 3-10. The distribution of the highest level of education completed at the time of the survey is presented in Table 3~38.2

Table 3-38

Highest Attained Level of Education

Highest Attained Level of Education	Trainee Status					
	Undergraduate	Percent	Graduate		Health Professional	
	Number		Number	Percent	Number	Percent
High School/GED	21	4.7	0	0.0	0	0.0
Freshman	32	7.2	0	0.0	0	0.0
Sophomore	69	15.5	0	0.0	0	0.0
Junior	42	9.4	0	0.0	0	0.0
Senior	262	58.7	0	0.0	0	0.0
Bachelor's Degree	17	3.8	4	44.4	47	77.0
Master's Degree	0	0.0	1	11.1	12	*19.7*
Ph.D.	3	0.7	4	44.4	2	3.3
Total	446		9		61	

2 It should be noted that although the STMSP program policies require that all participants must have completed at least 1 year of undergraduate education, some of the programs also serve students who have recently completed high school.

The fact that the largest proportions of the undergraduate students only had high school diplomas at the time of the survey indicates that the evaluation will not shed much light on eventual degrees received or graduate school majors, as outcomes related to the STMSP training. Only 17 or 4.0 percent of the undergraduate students had a bachelor's degree or higher at the time of followup.

3.6.2 Current Educational Level

Table 3-39 presents data on the **current educational level of** the trainees as compared to their status at the time they applied to the program. Of those who were undergraduate students at the time of application to the STMSP program. About three-fourths were pursuing advanced degrees, 73 had become full-time or part-time graduate students and 114 were health professional students. Of those who were graduate students at the time of application **to** the program, about two-thirds were still in graduate school or had become health professional students. The same is true for those who were health professional students at application—most were still in student status and only 10 percent were not enrolled in a college or university.

Table 3-39

Current Trainee Educational Status

Current Educational Level	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Full-time Undergraduate Student	**141**	**32.8**	**0**	**0.0**	0	0.0
Part-time Undergraduate Student	6	1.4	0	0.0	0	0.0
Full-time Graduate Student	60	14.0	13	44.8	3	4.2
Part-time Graduate Student	13	3.0	1	3.4	1	1.4
Health Professional Student	114	26.5	7	24.1	50	70.4
Enrolled, not Seeking Degree	9	2.1	0	0.0	0	0.0
Not Currently Enrolled	80	18.8	6	20.7	7	9.9
Other[3]	7	1.6	2	6.9	10	14.1
Total	**430**		**29**		**71**	

~ This category includes individuals who are medical residents.

3.6.3 Degree Trainee Is Currently Seeking

Trainees were asked what kind of degree they were currently seeking. The distribution of degrees sought at the time of followup is shown in Table 3-40. Of those who were undergraduate students when they applied to the program, 40 percent were still seeking a bachelor's degree, 11 percent were seeking a masters degree, and 39 percent were pursuing doctoral degrees. At the time of application, the bulk of health professional students (82 percent) were pursuing a doctorate at the time of followup. Of those who were graduate students at the time of program application 22 percent were pursuing a master's degree. 48 percent were seeking a doctorate degree, and 17 percent were pursing a combined M.D./Ph.D. degree.

Table 3-40

Type of Degree Sought

Degree Sought	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
2-year Associate's Degree	2	0.6	0	0.0	0	0.0
Bachelor's Degree	135	40.1	1	4.3	0	0.0
Masters Degree	37	11.0	5	21.7	3	4.9
Professional Doctorate MOO. D.,D.D.S.,D.V.M. Ph.D.)	133	39.5	11	47.8	50	82.0
Combined M.D/Ph.D.	1.5	4.5	4	17.4	4	6.6
Other Professional Degree (J.D., DrPH)	3	0.9	0	0.0	0	0.0
Other	12	3.6	2	8.7	4	6.6
Total	337		23		61	

3.6.4 How Far Trainees Had Advanced Toward Degree

The following table presents data comparing how far trainees advanced toward their degrees from the time they entered the program to the time of the survey. At the time of followup, 78 percent of those who were undergraduate students when they participated in the program indicated that they had completed some or all course work toward a degree as did 57 percent of the graduate students and 79 percent of the health professional students. The remainder

of individuals in each group (e.g.. 22 percent of those who were undergraduate students. 21 percent of health professional students, and 42 percent of those who were graduate students at the time of participation) were completing their graduate work or involved in "other" educational pursuits. Table 3-41 presents this information.

Table 3-41

Trainee Progress Toward Advanced Degree

Progress Toward Advanced Degree	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Completed Some Course Work	211	70.6	9	47.4	32	68.1
Completed All Course Work	22	7.4	2	10.5	5	10.6
Completed Qualifying Exams	11	3.7	1	5.3	4	8.5
Dissertation Proposal Approved	2	0.7	1	5.3	0	0.0
Data Collection in Progress/Completed	3	1.0	2	10.5	2	**4.3**
Dissertation Writing in Progress	1	0.3	3	15.8	0	0.0
Other[4]	49	16.4	1	5.3	4	8.5
Total	299		19		47	

3.6.5 Change of Major After the STMSP

Trainees were asked whether they changed their major after participating in the STMSP. Only a minority of students indicated that they had changed their academic major following their participation in STMSP (under 10 percent). This should not be surprising. It could be expected that many of those who participated in the program were already in a major that was potentially applicable to biomedical or behavioral research careers. Secondly, as indicated in previous tables, a substantial number of students were close to completion of their academic careers at the time of participation or already had a bachelor's degree. Finally, some proportion, as will be seen in Table 3-44, had joined the workforce. Indications of program success are more likely to be seen in degree pursuit, graduate school enrollment and completion, and field of employment.

[4] This category includes individuals who had been accepted into, but had not yet begun graduate programs as well as those who were currently in medical school.

3.6.6 Trainees' Major Fields of Study

Table 3-42 presents data that provide a picture of the changes made in trainee majors from the time they began STMSP participation (entry major) to the time of the survey (major at the time of survey).[5] Not surprisingly, trainees who applied to. and were accepted into the program, were majoring primarily in the health and biological sciences—327 out of 415. For example, 259 individuals majored in the biological sciences when they began STMSP participation. However, at the time of the survey, there were only 134 biological science majors. In contrast, 68 trainees majored in the health sciences when they entered the program, but by the time of the survey, the number of individuals majoring in this area increased by 152, resulting in a total of 220 health science majors. However, the subcategories under biological and health sciences make it difficult to assess if these changes indicated movement to a research-oriented career.

Table 3-42

Major Field of Study at Time of Program Entry and at Time of Survey

Trainee Majors	Number of Trainees Majoring in Discipline at Time of Program Entry	Number of Trainees Majoring in Discipline at Time of Survey
Agriculture	2	1
Arts and Humanities	2	5
Biological Sciences	259	134
Education	8	7
Engineering	11	10
Health Sciences	68	220
Social Sciences	19	18
Mathematical Sciences	4	5
Physical Sciences	35	12
Other[6]	7	3
Total Number of Respondents	**415**	**415**

[5] Information on trainees' major for this table was only analyzed for those individuals who responded to both questions regarding their major at time of STMSP entry as well as at the time of the survey.

[6] This category included disciplines such as law, social work, or other fields not included on the Academic Major and Employment Speciality list enclosed with the questionnaire.

3.6.7 Trainees' Areas of Career Interest

Information was collected on areas of career interest at the time of followup on the STMSP trainees. Trainees were allowed to circle all responses that applied. The results are shown in Table 3-43. This is perhaps the most telling information on the effects of the program and the individuals who participated in it. Of those who were undergraduate students at the time of application to the program, almost three-quarters (72 percent) indicated that they aspired to a career in basic or clinical research. Although multiple responses were allowed, another **60 percent** indicated an interest in a nonresearch medical career—although a medical degree is not inconsistent with a research career interest. Multiple response is evident among trainees who were graduate students at the time of program application—over 100 percent of this group indicated an interest in research careers, either basic or clinical. Nearly 60 percent indicated a long-term interest in a medical degree. Only one student in this group was undecided. Health professional students expressed more interest in a nonresearch career in medicine (67 percent) than in basic or clinical research (14 and *56* percent, respectively).

Table 3-43

Areas of Career Interest

Area of Career Interest	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Basic Research	105	22.3	13	***41.9***	11	14.3
Clinical Research	235	50.0	19	61.3	43	55.8
Medicine (Nonresearch)	284	60.4	18	58.1	52	67.5
Other Sciences	50	10.6	5	***16.1***	***6***	**7.8**
Undecided	20	4.3	1	3.2	5	6.5
Other	61	13.0	5	16.1	4	5.2
Total	470		31		77	

3.6.8 Honors and Awards

Over 60 percent of each category of trainee reported they had received honors and awards while enrolled in undergraduate or graduate school, with two-thirds of the undergraduate students reporting such achievements.

3.7 Employment

3.7.1 Current Employment Status

As shown in Table 3-44, almost half the undergraduate students (45 percent) and more than half the graduate and health professional students were unemployed at the time of followup. Of those who were employed, more than half were employed full-time.

Table 3-44

Trainee Employment Status

Employment Status	Trainee Status					
	Undergraduate		Graduate		Health Professional	
	Number	Percent	Number	Percent	Number	Percent
Employed (35 or more hours)	136	29.8	10	34.5	21	28.4
Employed Part-Time	115	25.2	4	13.8	13	17.6
Unemployed	205	45.0	15	51.7	40	54.1
Total	456		29		74	

3.7.2 Employment and Student Status

Not surprisingly, unemployment or part-time employment is associated with full- or part-time student status and full-time employment is related to not being currently enrolled in school. As shown in Table 3-45, the largest group of those employed full-time (35 or more hours per week) at the time of the survey (46 percent) were not enrolled in school. Of those who were employed part-time, the largest group were full-time undergraduate students *(52* percent). The next largest groups were full-time graduate students (19 percent) and health professional students (16 percent). Of those who were unemployed at the time of the survey, the largest group, almost half, were health professional students *(53* percent) followed by full-time undergraduate students (23 percent).

Table 3-45

Trainee Employment and Student Status

Current Student Status	Trainee Employment Status						Total	
	Employed 35 or More Hours		Employed Part-Time		Unemployed			
	Number	[Percent	Number	Percent	Number	Percent	Number	Percent
Full-Time Undergraduate	16	10.5	64	51.6	57	22.8	137	26.0
Part-Time Undergraduate	2	1.3	0	0.0	3	1.2	5	1.0
Full-Time Graduate	17	11.2	24	19.4	32	12.8	73	13.9
Part-Time Graduate	8	5.3	5	4.0	1	0.4	14	2.7
Health Professional	19	12.5	20	16.1	132	52.8	171	32.5
Enrolled, No Degree	5	3.3	1	0.8	3	1.2	9	1.7
Not Currently Enrolled	70	46.1	8	6.5	19	7.6	97	18.4
Other	15	9.9	2	1.6	3	1.2	20	3.8
Total	152		124		250		526	

3.7.3 Relationship of Work to Biomedical Research

As noted in Table 3-46, 26 percent of the undergraduate students and 29 percent of the graduate students who were employed indicated that they were employed in work related to biomedical research. This proportion was slightly higher for health professional students (32 percent).

Table 3.46

Employed in Work Related to Biomedical Research

Trainee Status	Number Employed	Number Employed in Work Related to Biomedical Research	Percent
Undergraduate	252	65	**25.8**
Graduate	14	4	28.6
Health Professional	34	11	32.4
Total	300	80	

* * * *

Section 4

Trainee and Applicant Comparison

Section 4

Trainee and Applicant Comparison

The Applicant Population

The following section provides a comparative analysis of STMSP trainees and applicants. A total of 221 applicants responded to the survey, and as noted earlier, there were a total of *592* trainees. The results of the evaluation, including demographic characteristics, research experience, and educational and employment status, for these two groups are presented below.[1]

4.1 Gender

Similar to trainee respondents, the majority of the applicant respondents were females. In fact, as shown in Table 4-1, nearly three-quarters of the applicants, compared to two-thirds of the trainees, were female.

Table 4-1

Trainee and Applicant Gender

	Trainee		Applicant	
Gender	Number	Percent	Number	p1 •rcefltj
		0	52	25.1
Male	202	0	155	74.9
Total	577		207	

4.2 Race and Ethnicity

As shown in Table 4-2, the trainee and applicant respondents were very similar in race and ethnicity, although a slightly higher percentage of trainees were Black (64 versus *58* percent).

[1] For a more detailed explanation on how the results were calculated, see Section 3.

Table 4-2

Trainee and Applicant Race and Ethnicity

RacelEthnicity	Trainee		Applicant	
	Number	Percent	Number	Percent]
American Indian or Alaska Native	17	3.0	5	**2.6**
Asian/Pacific Islander	67	*11.6*	29	15.2
Black, Not Hispanic	370	642	110	57.6
Hispanic	98	17.0	34	17.8
White, Not Hispanic	3	0.5	4	2.1
Other	21	3.6	9	4.7
Total	**576**		**191**	

43 Att~nrl~na-a at l-luo*~~v.~alli, Black Collecies and Universities

A somewhat higher percentage of the applicants (38 percent) than trainees reported that they had attended an Historically Black Colleges and Universities (HBCU) at the time of application to STMSP. Thirty percent of the trainees had attended an HBCU.

4.4 Grade Point Average

Higher proportions of the trainees *(45* percent) had grade point averages (GPAs) between 3.6 and 4.0 compared to 36 percent of the applicants. While more applicants (40 percent) than trainees (37 percent) had GPAs between 3.1 and *3.5,* fewer trainees had GPAs below 3.1. The GPA distribution is shown in Table 4-3. As noted in the table, 10 percent of the trainees had GPAs under 3.1 compared to 21 percent of the applicants. Thus, on average, the trainees had a higher GPA at application than the applicants.

Table 4-3

Trainee and Applicant GPAs

GPA	Trainee		Applicant	
	Number	Percent	Number	Percent
2.0-2.5	12	2.0	11	5.0
2.6 - 3.0	46	7.8	36	16.3
3.1 - 3.5	217	36.7	89	40.3
3.6 - 4.0	268	45.3	80	36.2
Other (Missing/ Pass-Fail)	48	8.1	5	2.3
Total	591		221	

Chi square tests were performed on the distributions of trainees and nonaccepted applicant respondents for gender, race/ethnicity, and GPA at the time of application to the STMSP. The calculated chi square statistic for gender was below the 95 percent confidence critical value, while the calculated chi square statistic for race/ethnicity and GPA at application was highly significant when compared to the 95 percent confidence critical value. The conclusion was that while the two populations are similar with regard to gender, the applicant population was significantly different from the trainee population in GPAs at the time of application to the program. For this reason, there was reluctance to use the applicants as a quasi-comparison group for the trainees. Therefore, the difference in the distributions of outcome variables between the trainees and applicants could not be used as a measure of program effect.

4.5 Reasons for Applying to the STMSP

Both trainees and applicants were asked why they applied to the STMSP. The choices included in the questionnaire are shown in Table 4-4. Although the general pattern of responses is similar, higher percentages of applicants mentioned obtaining research/training experience to determine if research was what they wanted to do, and having an interest in heart, lung, and blood health and disease research.

Table 4-4

Trainee and Applicant Reasons for Applying to STMSP

Reasons for Applying	Trainee		Applicant	
	Number	Percent	Number	Percent
Research/Training Experience	406	68.6	176	79.6
See If Research Is What I Want To Do	239	40.4	110	49.8
Interest in Heart, Lung, and Blood Research	112	18.9	61	27.6
Encouraged to Apply	134	22.6	50	22.6
Continue Prior Training Experience	26	4.4	11	5.0
Other	17	2.9	3	1.4
Total	592		**221**	

The "Other" category for applicants and trainees included the following: paid summer job that involved research, money to pay for school and expenses, desire to continue research in area, and good experience for medical school.

4.6 Research Experience Before Applying to the STMSP

As shown in Table *4-5*, the research experience of the trainees and applicants was similar at the time they applied to the STMSP. At least 60 percent of each group had hands-on laboratory experience and more than 40 percent had research experience at their home institution. About one-third of each group had been involved in research while in high school or had participated in research activities at another institution.

Table 4-5

Trainee and Applicant Prior Research Experience

Prior Research Experience	Trainee		Applicant	
	Number	Percent	Number	Percent]
High School Research	182	30.7	72	**32.6**
Hands-on Laboratory Experience	359	60.6	155	70.1
Home Institution Research	262	44.3	107	48.4
Other Institution Research	181	30.6	73	33.0
Attended Scientific Conferences	154	26.0	79	35.7
Presented Original Research	125	21.1	48	21.7
No Research Experience	118	19.9	45	20.4
Total	**592**		**221**	

4.7 Progress Toward Degree

Trainees and applicants were asked how far they had progressed toward a degree. As shown in Table 4-6, there was little difference in progress reported by trainees and applicants. For example, almost 70 percent of both trainees and applicants had completed some course work and about 7 percent had completed all course work toward an advanced degree. Trainees and applicants also had similar experiences in terms of the progress they had made in their graduate work. For instance, 4 percent of both groups had completed qualifying exams and generally 1 percent or less were involved in various stages of their thesis or dissertation preparation.

Table 4-6

Trainee and Applicant Progress Toward Degree

Progress Toward Degree	Trainee		Applicant	
	Number		Number	Percent
Completed Some Course Work	253	68.8	111	69.4
Completed All Course Work	29	7.9	10	6.3
Completed Qualifying Exams	16	4.3	7	4.4
Thesis/Dissertation Proposal Approved	4	1.1	1	0.6
Data Collection in Progress/Completed	7	1.9	2	1.3
Thesis/Dissertation Writing in Progress	4	1.1	1	0.6
Other[2]	55	14.9	28	17.5
Total	**368**		**160**	

4.8 Trainee/Applicant Areas of Career Interest

Both trainees and applicants, as shown in Table 4-7, chose nonresearch medicine and clinical research as their two primary areas of interest, although slightly more trainees than applicants chose these.

Table 4-7

Areas of career Interest

Career Interest	Trainee		Applicant	
	Number	Percent	Number	Percent
Basic Research	132	22.3	61	27.6
Clinical Research	301	50.8	112	50.7
Medicine (Nonresearch)	361	61.0	128	57.9
Other Sciences	61	10.3	36	16.3
Undecided	26	4.4	10	4.5
Other	71	12.0	24	10.9
Total	**592**		**221**	

2 This category includes beginning graduate school in fall, medical school in progress, completed degree, or just began school.

There was an extensive list of "Other" responses for both the trainees and the applicants, most with only one response. These included responses such as research unrelated to science. healthcare administration, health profession, or social science research.

4.9 Factors Influencing Applicants' Career Choices

As shown in Table 4-8, the two most important factors influencing the applicants' career choices were college studies and work experience, followed by humanitarian reasons; previous research experience; hobby or special interest; and high school or pre-college studies. Opinions of teachers, family, and friends; money; and prestige were among the least important reasons.

Table 4-8

Factors Influencing Applicants' career Choices

Level of Influence	Career Choice															
	High School/College Studies		College Studies		Work Experience		Hobby or Special Interest		Research Experience		Humanitarian Reasons		Money		Prestig	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very Important	**16**	**32.0**	**40**	**75.5**	**33**	**62.3**	**20**	**40.8**	**23**	**43.4**	**26**	**50.0**	**8**	**15.1**	**5**	**9**
Somewhat Important	19	**38.0**	10	18.9	13	24.5	21	42.9	12	22.6	18	34.6	20	37.7	27	50
Now Very Important	**11**	**22.0**	**2**	**3.8**	**5**	**9.4**	**5**	**10.2**	**11**	**20.8**	**5**	**9.6**	**19**	**35.8**	**16**	**30**
NotAtAll Important	4	8.0	1	1.9	2	3.8	3	6.1	7	13.2	3	5.8	6	11.3	5	9
Total	**50**		**53**		**53**		**49**		**53**		**52**		**53**		**53**	

4.10 Employment Status

As shown in Table 4-9, higher proportions of trainees were unemployed at the time of the survey compared to the applicants. This is consistent with the higher proportions of trainees in advanced degree programs.

Table 4-9

Employment Status

	Trainee		Applicant	
	Number	Percent	Number	Percent
Employed Full-Time	171	30.2	70	32.4
Employed Part-Time	132	23.3	65	30.1
Unemployed	264	46.6	81	37.5
Total	567		216	

4.11 Relationship of Work to Biomedical Research

As shown in Table 4-10, forty-three (32 percent) of the applicants *(135)* who reported that they were employed responded that their work was related to biomedical research. However, only 26 percent of the trainees who were employed indicated that their work was related to biomedical research.

Table 4-10

Employed in Work Related to Biomedical Research

Respondent	Number Employed	Number Employed in Work Related to Biomedical Research	Percent
Trainee	304	80	26.3
Applicant	135	43	31.9

* * * *

Section 5

Program Directors

Section 5

Program Directors

The STMSP Program Director Population

Thirty-four of the 42 STMSP program directors participated in the evaluation. The following section presents the evaluation results for this group.'

5.1 Director Characteristics and Program Involvement

5.1.1 Ethnicity and Gender

Of the 34 directors responding to the questionnaire, 26 provided race information: 18 were White (not of Hispanic origin), 5 were Black, I was American Indian/Alaska Native, I was Hispanic, and one responded as "other." Of the directors who responded to the gender question, 25 were men and 8 were women.

5.1.2 Director Role Other Than STMSP Director

Program directors were asked about their roles within their institutions, other than providing leadership for the STMSP. They described their roles as shown in Table 5-1.

Table 5-1

STMSP Director Roles in Addition to the STMSP

Director Role Other Than STMSP	Number	Percent
Choices Listed in Questionnaire		
About Half Research and Half Administrative	8	27.6
Primarily Research	4	13.8
Primarily Administrative	6	20.7
Responses Volunteered by Directors		
Teaching, Research, Administrative	3	10.3
Half Teaching, Half Research	2	6.9
Student Advising and Mentoring	1	**3.4**
Research, Clinical, Administrative	1	**3.4**
Promotion and Recruitment of Programs and Faculty	1	**3.4**
Department Chair	1	**3.4**
Other, Not Specified	2	6.9
Total	**29**	

For a more detailed explanation on how the results were calculated, see Section 3.

5.1.3 Director Time Spent on STMSP Activities

During the period of STMSP training, the average program director spends 11 hours and 27 minutes per week on program activities. When the STMSP is not in session, the average program director spends 4 hours and 32 minutes per week on STMSP-related business.

5.2 STMSP Institutions

5.2.1 Type of Institution

The directors were asked whether their institutions were hospitals. clinics, research centers, or universities. Three reported that their institution was a hospital and 26 replied that they were located in a university. Twenty-two (85 percent) of the directors reported that their institution included a medical school. Over half of the universities *(58* percent) offered a masters program in biomedical and behavioral sciences, and almost three-quarters (19) indicated that their institution offered a doctoral program in the biomedical and behavioral sciences.

5.2.2 First STMSP Participation and Duration of Program

Among survey respondents, the first grants were awarded in 1991 to four institutions, followed by nine in 1992, eight in 1993, one in 1994, seven in 1995, and three in 1996.

5.2.3 Duration of STMSP Training

Most STMSP training programs lasted either 10 or 12 weeks, as shown in Table *5-2.* One director reported a 24-week session, and 14 reported 10-week sessions. However, one director reported having sessions that range from 8 to 10 weeks; another reported having sessions that range from 10 to 12 weeks; and a third director indicated that the sessions range from 10 to 24 weeks.

Table 5-2

Duration of STMSP Training

		9	*10*	*11*	*12*	*24*
	8	*Duration of Programs: Number of Weeks*				
Numberof	*3*	*2*	*14*	*2*	*12*	*1*
L Programsj						

5.2.4 Institutional Support

STMSP directors were asked about the four areas of institutional support listed in Table *5-3.* Multiple selections were allowed. Almost 80 percent of the program directors cited the provision of additional program resources as the main area of institutional support. Follow-up of former trainees was the second most frequently mentioned area (73 percent). followed by release time from normal teaching duties for faculty and staff associated with the program (65 percent). Sixty-two percent of the program directors cited supplemental funds for trainee expenses and another 62 percent indicated that other sources of additional institutional support such as office space, housing, or computer support were provided to the program.

Table 5-3

Institutional Support for the STMSP

Area of Support	Number	Percent
Provides Resources in Addition to Grant Requirements	27	79.4
Conducts Followup of Former Trainees	25	73.5
Provides Staff Release Time	22	84.7
Provides Supplemental Funding for Trainees	21	61.8
Other	21	61.8
Total	**34**	

Slightly more than half of the directors (53 percent) indicated that their institution's level of support (funding, research staff time. laboratory space. equipment) increased from what was proposed in the institution's STMSP grant application. The rest of the directors (47 percent) indicated that their institution's support remained as proposed.

5.2.5 Institutional Staff Involvement in the STMSP

The director survey also asked about the involvement of staff in the seven aspects of the program listed in Table *5-4.* Responses indicate a high level of staff involvement in STMSP activities. The most common areas of staff involvement were mentoring (88 percent) and research training (82 percent). About three-quarters also mentioned selection of the trainees (79 percent) and program planning (73 percent). Over half (59 percent) also noted recruitment of trainees. Direct teaching of courses was less common (44 percent), reflecting the program's emphasis on research. Other support included leading research discussions, providing laboratory materials, conducting seminars, and providing administrative support.

Table 5-4

Staff Involvement in the STMSP

Staff Involvement	Number	Percent
Mentoring	30	88.2
Research Training	28	82.4
Selection of Trainees	27	79.4
Planning Program Activities	25	73.5
Recruitment of Trainees	20	58.8
Teaching Courses	15	44.1
Specifying Resources Needed for the Program	11	32.4
Other	13	38.2
Total	**34**	

5.2.6 Director Satisfaction With Level of Institutional Support

Directors were asked how satisfied they were with the four types of institutional support listed in Table 5-5. For the most part, directors were very satisfied with the research faculty/staff assigned to the STMSP, the amount of release time, and the laboratories and equipment available for STMSP trainees. The exception was in the resources for trainee recruitment. Only 52 percent of the directors indicated that they were very satisfied with that aspect of the program.

Table 5-5

Director Satisfaction With Level of Institutional Support

Level of Satisfaction	Areas of Support							
	Research Faculty/Staff Assigned		Amount of Release Time		Laboratories/ Equipment Available		Recruitment ~Resources	
	N		N		N			
Very Satisfied	29	87.9	23	82.1	30	90.9	16	51.6
Somewhat Satisfied	3	9.1	1	3.6	0	0.0	12	38.7
Somewhat Dissatisfied	0	0.0	2	7.1	1	3.0	2	6.5
Very Dissatisfied	1	3.0	2	7.1	2	6.1	1	3.2
Total	**33**		**28**		**33**		**31**	

5.2.7 Linkages to Other Research Initiatives That Target Minority Groups

Program directors were asked about linkages to other research initiatives at their institutions. As shown in Table *5-6,* almost three-quarters of the directors cited shared research staff as a linkage with other initiatives. Slightly lower percentages reported joint research activities, shared laboratory space, equipment, materials, and social research activities, such as seminars and field trips as principal linkages to other institutions. Less than one-fifth reported little or no linkage with other research initiatives.

Table 5-6

Linkages to Other Research Initiatives

Linkages	Number	Percent
Shared Research Staff	25	73.5
Joint Research Activities	23	67.6
Shared Laboratory Space	22	64.7
Shared Equipment and Materials	21	61.8
Joint Social Activities (e.g., Seminars, Field Trips)	20	58.8
Little or No Linkage	6	17.6
Total	**34**	

5.3 Trainee Recruitment

Program directors were asked about the methods they used to recruit students for the STMSP. The methods listed in the questionnaire are shown in Table *5-7.* The primary method of recruitment was referrals from other trainees (82 percent). More than two-thirds of the directors also reported using referrals from faculty/research staff, distributing flyers and brochures, using referrals from other institutions, and visiting targeted schools. In addition, directors used presentations at research symposia or placed announcements in newsletters and scientific journals, and five institutions used the Internet. Other recruitment methods included referrals from other minority programs, mailers to predominantly Black institutions, and targeting students in high schools.

Table 5-7

Methods of STMSP Trainee Recruitment

Methods of Recruitment	Number	(Percent I
Referrals From Other Trainees	28	82.4
Referrals From Research Faculty/Staff	27	79.4
Brochures/Flyers	27	79.4
Referrals From Other Institutions	26	76.5
Visits to Targeted Schools	25	73.5
Presentations at Research Symposia/Science Fairs	19	55.9
Announcements in Newsletters/Scientific Journals	15	44.1
Internet	**5**	**14.7**
GRE Locator Service	4	:11.8
Other	13	38.2
Total	**34**	

5.3.1 Frequency of Recruitment of Applicants for the Program

Thirty-two percent of the STMSP programs reported that they recruit applicants throughout the year. Twenty-five percent recruit periodically during the year, and 29 percent recruit once annually for the program.

5.3.2 Director Satisfaction With Recruitment Process

Directors were asked to assess their satisfaction with various aspects of the recruitment process including the number, qualifications, geographic coverage, and overall procedure for the recruitment of trainees. The results are shown in Table *5-8.* Sixty-seven percent of the program directors who responded were very satisfied and 24 percent were somewhat satisfied with the overall recruitment process. Similarly, 73 percent of the directors were very satisfied with the qualifications of the applicants and 24 percent were somewhat satisfied with the applicants' qualifications. Also, 61 percent of the directors were very satisfied with the number of applicants, and 36 percent were somewhat satisfied. In addition, more than three-quarters of the directors were very satisfied with the geographic area of recruitment for their programs. Less than 20 percent of the directors expressed dissatisfaction with any aspect of the recruitment process.

Table 5-8

Satisfaction With Recruitment Process

Level of Satisfaction	Aspect of Recruitment							
	Number of Applicants		Qualifications of Applicants		Geographic Area of Recruitment		Overall Recruitment Procedure	
	N		N		N		N	
Very Satisfied	20	60.6	24	72.7	26	78.8	22	66.7
Somewhat Satisfied	12	36.4	8	24.2	6	18.2	8	24.2
Somewhat Dissatisfied	1	3.0	0	0.0	1	3.0	3	9.1
Very Dissatisfied	0	0.0	1	3.0	0	0.0	0	0.0
Total	**33**		**33**		**33**		**33**	

5.4 Trainee Selection

Overall, the program directors reported being quite satisfied with the various aspects of their program's selection process and the results of that process in terms of the qualifications of the trainees selected.

5.4.1 Staff Involved in Selecting Trainees

The directors were asked who is involved in selecting trainees from the pool of applicants—the director, faculty/staff, institutional administrators, current or previous trainees, or staff of other institutions. Over 90 percent of the directors responding to this question indicated that the director and research faculty/staff were involved in the selection of trainees. Only about half of the directors indicated that other institutional administrative staff members were involved in the selection process and 15 percent stated that staff of other institutions were involved. Finally, only one director said that STMSP trainees themselves were involved in the selection process. Table 5-9 shows the responses.

Table 5-9

Staff Involved in Trainee Selection

Staff Involved in Selection	f_Number	Percent
Program Director	**32**	**94.1**
Research Faculty/Staff	31	**91.2**
Institution Administrators	17	50.0
Staff of Other Institutions	5	14.7
Other Trainees	1	2.9
Total	34	

5.4.2 Relative Importance of Selection Criteria

Directors were asked to rate the importance of various selection criteria in choosing STMSP participants from among the pool of applicants. Potential criteria were rated on a 6-point scale, from 1 for the least important to 6 for the most important. The criteria that were rated included the following.

- Demonstrated Interest—including the applicant's academic major, extracurricular activities, and association memberships.
- Expressed Interest—as available in the applicant's application or interview.
- Recommendations—from research faculty and staff or other professionals.
- Grade Point Average—from the home institution.
- SAT Scores.

The reported ratings were constructed as the weighted average of the scores on each criteria among those who responded to the question. The criteria were ranked as shown in Exhibit *5-1*. Demonstrated interest in the program was the most important factor, followed closely by recommendations from faculty and staff and expressed interest. Grade point average was rated somewhat lower. Least used were SAT scores which received a weighted ranking half that of grade point average. Table 5-10 shows the program directors' weighted ranking of their satisfaction with various aspects of the selection process.

Exhibit *5-1*

Ranking of Selection criteria

Criteria	Ranking
Demonstrated Interest	5.4
Recommendations	5.3
Expressed Interest	**5.2**
Grade Point Average	4.6
SAT Scores	2.3

5.4.3 Minimum Grade Point Average

Twelve of the thirty directors who responded to this item (40 percent) indicated that a minimum grade point average was not required for program admission. Of those indicating the use of a minimum GPA, the GPA value used by 12 of the directors was 3.00. The remaining seven directors reported a range from 2.50 to 3.50.

5.4.4 Director Satisfaction With Trainee Selection

Directors were asked about their satisfaction with various aspects of the trainee selection process including the criteria used to select trainees, the information available for use to assess trainees, the trainees who were selected, and the overall procedure for selecting trainees. As shown in Table *5-10,* between 67 and 82 percent of the directors indicated that they were very satisfied with each aspect of the selection process. Nearly all respondents indicated that they were very satisfied or somewhat satisfied with each of the named aspects.

Perhaps most important is satisfaction with the trainees selected for the program. Seventy-three percent of the directors indicated that they were very satisfied with the trainees selected and 23 percent indicated they were somewhat satisfied with the trainees selected. Only one director expressed dissatisfaction with the trainees selected.

Virtually all responding directors indicated that their recruitment and selection criteria identified properly the type of students that they wanted to participate in the program. Three-fourths indicated they were very satisfied with the overall selection procedure.

Table 5-10

Director Satisfaction With Aspects of the Selection Process

Level of Satisfaction	Aspect of Recruitment							
	Criteria Used for Selection		Information Available to Assess Trainees		Trainees Who Were Selected		Overall Selection Procedure	
			N				N	
Very Satisfied	**28**	**82.4**	**22**	**66.7**	**25**	**73.5**	**22**	**75.9**
Somewhat Satisfied	6	17.6	11	**33.3**	**8**	**23.5**	**7**	**24.1**
Somewhat Dissatisfied	0	0.0	0	0.0	0	0.0	0	0.0
Very Dissatisfied	0	0.0	0	0.0	1	2.9	0	0.0
Total	**34**		**33**		**34**		**29**	

5.5 Trainee Research Assignments and Activities

Eighty-four percent of the directors responding indicated that both clinical and basic research projects were available to STMSP trainees. The remaining directors, all at universities, indicated that only basic research projects were available. Among the research projects available, all directors indicated that assignments in the area of cardiovascular research were available, 82 percent indicated that pulmonary research projects were available, and 85 percent indicated that hematologic research projects were available.

5.5.1 Assigning Trainees to Research Projects

There was some variation in the process used to assign trainees to STMSP research projects. No director indicated that the trainees selected his or her research assignment. By far the majority (74 percent) indicated that the assignment was a joint decision between the trainee and STMSP staff. Over one-fifth of the directors indicated that trainee assignments to specific research projects were made by STMSP staff. One director indicated that the assignments to STMSP projects were made by a steering committee for summer programs.

Two-thirds of the responding directors indicated that there had been no changes in either the process for assigning trainees to research projects or to the types of projects available for trainees to work on since the program began. Of those reporting that changes had been made, one noted that interested advisors had to submit possible projects for inclusion in the program and five said they had increased the number of projects available to trainees.

5.5.2 Staff Assigned to Work With Trainees

Almost two-thirds of the directors indicated that one research faculty or staff member was assigned to work with trainees on the research projects. Slightly more than one-fourth indicated that two faculty or staff were assigned to work with trainees on a research project. Nine percent indicated three faculty or staff were assigned to trainees. The remainder indicated that various numbers of faculty and staff were assigned to work with trainees.

Eighty-eight percent of the directors indicated that each trainee was assigned one specific researcher as a mentor who had primary responsibility for providing personal guidance and advice about his or her education and career. Three programs had no such requirement.

On average, STMSP trainees would work with two or three junior research faculty or staff during their training period. There was more variation in the number of senior faculty or staff with whom the trainee would work, with the average falling between four and five senior staff.

5.6 STMSP Enrichment Activities

Directors were asked about the availability of enrichment activities to complement the research projects provided in the STMSP. Nearly all of the directors indicated that research forums, seminars, and guest lecturers were provided for trainees as a part of the STMSP; and almost 90 percent indicated that student presentations were available. Three-quarters indicated that social activities and events were available as a part of the program, and over half said that GRE preparation and graduate school counseling were provided. Smaller proportions indicated that special courses, workshops, and individual tutoring were made available as a part of the STMSP. "Other" activities that were mentioned included career development activities, a research journal club, and site visits/field trips.

Table 5-11

STMSP Enrichment Activities

Enrichment Activities	Number	Percent
Research Forums, Seminars, Guest Lecturers	33	97.1
Student Presentations	30	88.2
Social Activities and Events	26	76.5
GRE Preparation/Graduate School Counseling	18	52.9
Special Courses	13	38.2
Workshops	11	32.4
Individual Tutoring	10	29.4
Total	**34**	

5.6.1 Timing of Trainee Evaluation

Ninety percent of the program directors indicated that they evaluated the progress of trainees during their participation in the STMSP. Almost half reported that this evaluation took place at the end of the session and another third noted that trainee evaluation was an ongoing activity during the session. Nine percent reported both ongoing evaluation and one at the end of the session; the remaining 5 percent stated that an evaluation was performed midway through the STMSP session.

5.6.2 Staff Involved in Trainee Evaluation

Almost 80 percent of the directors indicated that the trainees' mentors were involved in the evaluation of the trainees' progress, and almost 60 percent indicated that they—the directors—were involved in the evaluation of the STMSP trainees. Fewer (35 percent) stated that other STMSP faculty and research staff contributed to the evaluation process. Finally, one director said that the selection committee was involved in the evaluation process and another reported that the trainee was involved in the evaluation process.

5.6.3 Uses of Trainee Evaluation

A number of uses were made of the results of the evaluation. Three-quarters of the directors reported that the evaluations were used to determine the trainees' strengths to encourage them to pursue a research career and to assess the effectiveness of the research training. Sixty- two percent said that the evaluation was used to provide a basis for recommendations for grants, fellowships, or graduate schools, and 59 percent stated it was to identify areas for improvement in the program. Fifty percent used the evaluation to determine whether the program is targeting students with the appropriate background. These results are shown in Table *5-12.*

Table 5-12

Uses of Trainee Evaluation

Uses of Trainee Evaluation	Number	Percent
Assess Research Training Effectiveness	26	76.5
Encourage Pursuit of a Research Career	25	73.5
Provide Basis for Recommendations	21	61.8
Identify Areas for Improvement	20	58.8
Assess Enrichment Activities Effectiveness	18	52.9
Assess Whether Program Is Targeting Students With Appropriate Background	17	50.0
Identify Trainee Training or Support Needs	10	29.4
Total	**34**	

Other uses mentioned for the evaluation included assessing the effectiveness of the mentor and assessing the impact of the STMSP research experience on the career plans of the trainee.

Directors were asked whether and how the results of the evaluation were shared with the trainee. In almost two-thirds of the cases, the results were shared verbally with the trainee. In three programs, the results of the evaluation were shared in writing. In two programs, the evaluation results were shared both verbally and in writing with the trainee. In four cases, the results were not shared with the trainee.

Overall, the program directors stated that their STMSP was very successful or fairly successful in each of the areas listed in the survey:

- Increasing trainees' knowledge of various biomedical and behavioral careers;
- Enhancing trainees' research skills;
- Increasing trainees' knowledge of typical research duties and responsibilities;
- Increasing trainees' understanding of the education and training required for a career in the biomedical and behavioral sciences;
- Developing trainees' sense of belonging to the scientific community; and,
- Increasing trainees' understanding of the rewards of biomedical and behavioral research careers.

5.7 Followup of Trainees After Completion of the STMSP

Eighty-five percent of the program directors indicated that their programs followed trainees after participation in the STMSP. However, when asked how long they followed the trainees, over 60 percent indicated that they did not follow up on a regular basis. Of those that did formal followups, the period ranged from 1 to 10 years for each type of student—undergraduate, graduate, or health professional student. Almost 80 percent of the directors indicated that their institution provides nonfinancial support to former trainees. Such support includes networking, letters of recommendation, invitations to research symposia, and periodic contact with mentors.

* * * *

Section 6

Research Faculty and Staff

Section 6

Research Faculty and Staff

The Research Faculty and Staff Population

A total of 89 STMSP research faculty and staff participated in the survey. The evaluation results for this group are presented below.[1]

6.1 Faculty and Staff Characteristics

Of the 79 who responded to the race question, 66 of the STMSP faculty/staff were White (not of Hispanic origin), three were Hispanic, three were Black (not of Hispanic origin), and seven were Asian or Pacific Islander. Of the 86 responding to the survey question of gender, 63 were men and 23 were women.

6.2 Faculty and Staff Involvement in the STMSP Activities

As shown in Table 6-1, about two-thirds of the STMSP faculty and staff were involved in teaching courses and research training; 15 percent were involved with mentoring the trainees. Only five were involved in the selection of the trainees. Three of the faculty/staff respondents mentioned an "other" category that included leading research discussions.

Table 6-1

Faculty and Staff Involvement in STMSP Activities

Faculty/Staff Involvement in STMSP Activities	Number	Percent
Research Training	59	**66.3**
Teaching Courses	57	**64.0**
Mentoring	13	14.6
Planning Program Activities	7	7.9
Specifying Resources Needed for the Program	7	7.9
Selecting Trainees	5	5.8
Other	3	3.4
Total	89	

[1] For a more detailed explanation on how the results were calculated, see Section 3.

6.2.1 Faculty and Staff Time Commitment to STMSP Activities

Faculty/staff indicated that they spent an average of 9.4 hours per week working directly with trainees, planning activities, attending special seminars, and other events when the program was in session. They indicated that they spent an average of 3 hours per week on STMSP activities during the rest of the year.

Sixty-five (73 percent) of the faculty/staff respondents served as a mentor to trainees in the program. The number of trainees they mentored ranged from 1 to 5, with an average of 1.2 trainees per mentor.

6.3 Faculty and Staff Involvement in Trainee Recruitment

Twenty-six (29 percent) of the 89 faculty/staff responding to the questionnaire indicated that they had participated in the activities associated with the recruitment of trainees. Two gave presentations at research symposia/science fairs, five visited targeted schools, three prepared announcements for newsletters/scientific joumals, eight reviewed applications to evaluate applicant qualifications, five interviewed applicants, and three served on committees that assessed applicants.

6.3.1 Effectiveness of Recruitment Methods

Faculty/staff were asked to comment on the relative effectiveness of the various forms of recruitment. As shown in Table 6-2, referrals were rated as the most effective recruitment strategy. Referrals from trainees and from other institutions were the most highly rated, followed closely by brochures and flyers. Visits to schools and announcements in newsletters and journals were reported as the next most effective measures.

Table 6-2

Effectiveness of Recruitment Methods

Assessment of Recruitment Method	Recruitment Activity															
	Presentations at Research		Visits to Schools		Announcements in Newsletters and Journals		Referrals From Research Faculty/Staff		Referrals From Other Trainees		Referrals From Other Institutions		GRE Locator Service		Brochuresl Flyers	
	iii 3IiL				~ZL3IZ1YYZ				%11131N1%						N	
Very Effective	1	8.3	3	27.3	3	27.3	3	231	6	462	5	45.5	0	0.0	3	30.0
Somewhat Effective	6	~	4	38.4	3	27.3	7	538	5	385	3	27.3	1	10.0	4	40.0
Somewhat Ineffective	1	8.3	1	9.1	4	38.4	1	7~7	1	77	1	9.1	2	20.0	1	10.0
Very Ineffective	1	8.3	0	0.0	0	0.0	1	77	1	77	2	18.2	0	0.0	0	0.0
Not Applicable	3	25.0	3	27.3	1	9.1	1	77	0	00	0	0.0	7	70.0	2	200
Total	12		11		11		13		13		11		10		10	

6.3.2 Recruitment Targeting

The number and percent of faculty/staff who said their institution targets specific population groups is shown in Table 6-3.

Table 6-3

Recruitment of Target Groups

Target Groups	[II~7~e~entI	
American Indians or Alaska Natives	4	18.2
Asians/Pacific Islanders	2	9.1
Blacks, Not of Hispanic Origin	8	36.4
Hispanics	6	27.3
Whites, Not of Hispanic Origin	1	4.5
Other	1	4.5
Total	22	

6.3.3 Number and Qualifications of Applicants

As shown in Table 6-4, of the 14 faculty/staff who responded to the question regarding an assessment of the applicants to their program, three-quarters believed that they received applications from more qualified applicants than they could accept. Only one person reported not receiving enough applications from qualified applicants.

Table 6-4

Faculty Assessment of Applications Received

Adequacy of Applications Received	Number	Percent
We receive applications from more qualified applicants than we can accept.	11	**78.6**
We receive just enough applications from qualified applicants to fill our slots.	2	14.3
We do not receive enough applications from qualified applicants to fill all slots.	1	**7.1**
Total	14	

Only five of the faculty/staff indicated that there had been any changes in recruitment methods at their institution since the program began.

6.3.4 Faculty/Staff Satisfaction With Trainee Recruitment

Faculty/staff were asked about their satisfaction with various aspects of the recruitment process such as the number of applicants, qualifications of the applicants, the geographic area in which they recruit, and the overall procedures used for recruitment. Generally, respondents were satisfied with all four aspects. The distribution of responses is shown in Table *6-5.*

Table 6-5

Satisfaction With Recruitment Methods

Level of Satisfaction	Aspect of Recruitment							
	Number of Applicants		Qualifications of Applicants		Geographic Area of Recruitment		Overall Recruitment Procedure	
	N	%3H2ITLN~%						
Very Satisfied	5	38.5	4	30.8	5	38.5	5	38.5
Somewhat Satisfied	6	46.2	8	61.5	7	53.8	7	53.8
Somewhat Dissatisfied	2	15.4	0	0.0	0	0.0	1	7.7
Very Dissatisfied	0	0.0	1	7.7	1	7.7	0	0.0
Total	13		13		13		13	

6.4 Trainee Selection

6.4.1 Staff Involved in Selecting Trainees

Twenty of the faculty/staff indicated that they were involved in the selection of trainees for the program. They were asked to rank the selection criteria used to choose trainees from "1" (least important) to "6" (most important). The weighted average of their rankings are shown in Exhibit 6-1. Applicant's demonstrated interest includes academic major, extracurricular activities, and association memberships. Expressed interest is derived from application or interviews. Recommendations may be from faculty/staff or other professionals at the STMSP grantee institution or other institutions. Demonstrated interest ranked highest followed by expressed interest, grade point average, and recommendations. SAT scores received the lowest ranking.

Exhibit 6-1

Faculty and Staff Ranking of Selection Criteria

Criteria	Ratln
Applicants Demonstrated Interest	5.0
Applicants Expressed Interest	4.7
Grade Point Average	4.4
Recommendations	4.3
SAT Scores	2.9

These ratings are similar to those given by STMSP directors, except that directors gave applicant's expressed interest and recommendations a higher rating than did faculty/staff.

Only 4 of the 20 respondents reported that applicants who do not meet all the criteria are sometimes accepted in order to fill all the program slots. All others said they are not accepted.

6.4.2 Faculty/Staff Satisfaction With Trainee Selection

Faculty/staff were asked how satisfied they were with various aspects of the selection process. The distribution of responses among those who were involved in the selection process is shown in Table 6-6.

Table 6-6

Satisfaction With Aspects of the Selection Process

Level of Satisfaction	Aspect of Selection Process							
	Criteria Used for Selection		Information Available to Assess Trainees		Qualifications of Trainees Selected		Overall Selection Procedure	
	111K		ILFIZiZEFI				N	
Very Satisfied	9	42.9	8	38.1	8	38.1.	9	42.9
Fairly Satisfied	11	52.4	12	57.1	9	42.9	9	42.9
Fairly Dissatisfied	1	4.8~	1	4.8	3	14.3	2	9.5
Very Dissatisfied	0	0.0	0	0.0	1	4.8	1	4.8
Total	**21**		**21**		**21**		**21**	

6.5 Faculty/Staff Involvement in STMSP Activities

6.5.1 Trainee Research Assignments and Activities

All faculty/staff were asked to indicate whether the projects they worked on with trainees were basic or clinical research or both. Seventy-four percent indicated that the projects they were involved with were basic research only, 24 percent indicated that their projects were both clinical and basic research, and 2 percent indicated that they were involved in clinical research only.

The faculty/staff were also asked about the nature of their research projects. Fifteen (17 percent) indicated that their projects were pulmonary research, eleven (12 percent) indicated

that their projects were hematologic research, and 35 (39 percent) indicated that their projects were cardiovascular research. Forty-five indicated that their research was in other areas such as environmental health or pharmacology.

Faculty/staff were asked about the biggest challenges in working with the STMSP trainees. The responses are shown in Table 6-7.

Table 6-7

Challenges Working With Trainees

Challenges Working With STMSP Trainees	Number	Percent
Enhancing Trainees' Research Skills	53	**59.6**
Instilling an Understanding of a Research Career	42	47.2
Helping Trainees Feel Like They Belong in the Research Community	31	34.8
Creating/Maintaining Trainees' Interest in a Research Career	25	28.1
Getting Trainees to Participate in Enrichment Activities	6	6.7
Total	89	

Several respondents (8 percent) also mentioned lack of time as a challenge in working with trainees.

6.5.2 Enrichment Activities

The forms of enrichment activities and the proportion of faculty/staff indicating they were available are shown in Table 6-8. In addition to the areas listed in the questionnaire, one respondent mentioned a journal club and another mentioned clinical experience.

Table 6-8

Enrichment Activities Available to Trainees

Enrichment Activities	Number	Percent
Research Forums, Seminars, Guest Lecturers	77	86.5
Student Presentations	60	67.4
Social Activities and Events	49	55.1
Individual Tutoring	25	28.1
Workshops	17	19.1
Special Courses	14	15.7
GRE Preparation/Graduate School Counseling	12	13.5
Total	89	

A comparison of STMSP director responses to this same question shows a smaller percentage of faculty/staff respondents reporting having these enrichment activities available for trainees. This difference may be explained by the fact that not all faculty/staff had direct involvement in the STMSP and therefore may not have been aware of the various STMSP activities.

6.5.3 Effectiveness of Enrichment Activities

Faculty/staff were also asked how effective the various enrichment activities were in meeting the goals of the STMSP. As shown in Table 6-9, most of the activities were rated as being either very or somewhat effective. However, almost a third of the respondents rated workshops and GRE preparation/graduate school counseling as being somewhat or very ineffective.

Table 6-9

Effectiveness of Enrichment Activities

Level of Effectiveness	Enrichment Activity													
	Research Forums, Seminars, Lectures		Special Courses		Student Presentations		Workshops		GRE Preparationl Graduate School Counseling		Individual Mentoring		Social Activities and Events	
Very Effective	31	44.9	7	31.8	38	58.5	5	18.5	3	17.6	33	70.2	14	28.0
Somewhat Effective	31	44.9	13	59.1	24	36.9	14	51.9	9	52.9	14	29.8	33	86.0
Somewhat Ineffective	7	10.1	1	4.5	3	4.6	6	22.2	3	17.8	0	0.0	1	2.0
Very Ineffective	0	0.0	1	4.5	0	0.0	2	74	2	11.8	0	0.0	2	4.0
Total	69		22		65		27		17		47		50	

6.6 Trainee Followup and Evaluation

6.6.1 Faculty/Staff Involvement in Trainee Evaluations

Thirty-one (48 percent) of the faculty/staff indicated that they were involved in the evaluation of trainees' progress during and at the end the trainees' STMSP experience. Of those responding, 3 percent indicated that evaluation was done midway through the STMSP experience, 52 percent indicated that evaluation was done at the end of the session, 36 percent responded that their program provided ongoing feedback throughout the session, and 10 percent indicated that feedback was provided at other times. For instance, faculty at one

institution stated that a pre-program evaluation was conducted to assess trainees' skills before they participated in the STMSP.

Staff involved in the evaluations included the mentor (46 percent), the STMSP director (18 percent), other STMSP faculty/staff (17 percent), and other parties to the program (1 percent). "Other parties" included postdoctoral students.

6.6.2 Uses of Trainee Evaluation

Trainee evaluations can be used in a number of ways. The various uses of evaluations and the frequency of their use, according to faculty/staff involved in the program, are presented in Table 6-10. Four percent of the faculty/staff indicated that the evaluation results were used in other ways, including to assess the effectiveness of the trainees' mentor.

Table 6-10

Uses of Trainee Evaluations

Uses of Trainee Evaluations	Number	Percent
Identify Trainee Strengths to Encourage Research Career	26	**29.2**
Assess Effectiveness of Research Training	26	29.2
Provide Basis for Recommending Trainee for Grants, Fellowships, Etc.	19	21.3
Identify Areas in Which Trainee Needs More Tutoring or Support	13	14.6
Assess If Program Is Targeting Students with Appropriate Background/Skills	12	13.5
Assess Effectiveness of Enrichment Activities	11	12.4
Identify Areas Needed to Improve STMSP	10	11.2
Other	4	**4.5**
Total	89	

Faculty/staff were also asked how the evaluation results were shared with trainees. Of the 58 *(65* percent) who responded, 3 percent indicated that the results are shared in writing, 36 percent indicated that the results are shared verbally, and 8 percent indicated that the results are shared both verbally and in writing. Two percent stated that the results are not shared with the trainee.

Sixteen of the faculty/staff indicated that they are involved in followup activities. Almost 70 percent of the faculty/staff said they maintain contact with trainees after the STMSP session is over. Twenty-one percent indicated this contact includes networking. Fifty percent said they provide letters of recommendation. Four percent indicated they extend invitations to research symposia. Thirty-one percent indicated continued contact through the

mentors, and 22 percent reported ongoing contact through continued work on research papers and publications.

6.7 Faculty and Staff Assessment of Program Success

Faculty/staff were asked to assess the success of the STMSP in their institution. As shown in Table 6-11, faculty and staff generally believed that the program was successful. Increasing the trainee's knowledge of typical research duties was rated as the most successful aspect, followed closely by increasing trainee's understanding of education/training needed for a research career, enhancing trainee's research skills, and increasing trainee's knowledge of the various biomedical and behavioral research careers. Although generally rated as successful, developing the trainee's sense of belonging to the research community and increasing the trainee's understanding of the rewards of biomedical and behavioral research received the lowest rating of success.

Table *6-11*

Evaluation of Program Success

Level of Success	Success Criteria											
	Developing Trainee's Sense of Belonging to the Research Community		Increasing Trainee's Knowledge of Typical Research Duties		Increasing Trainee's Understanding of Education/ Training Needed for Research Careers		Enhancing Trainee's Research Skills		Increasing Trainee's Knowledge of the Range of Positions in Biomedical Careers		Increasing Trainee's Understanding of the Rewards of Biomedical Research	
	N	%	N	%	i3ZI~i		N	%	N	~		
Very Successful	25	32.1	55	88.3	44	54.3	41	49.4	40	49.4	27	34.2
Somewhat Successful	43	55.1	20	24.1	34	42.0	40	48.2	39	48.1	42	53.2
Somewhat unsuccessful	7	9.0	7	8.4	3	3.7	2	2.4	1	1.2	8	10.1
Very Unsuccessful	3	3.8	1	1.2	0	0.0	0	0.0	1	1.2	2	2.5
Total	78		53		81		83		81		79	

* * * *

Section 7

Summary of Case Study Site Visits

Section 7

Summary of Case Study Site Visits

As part of the evaluation, KRA visited five of the grantee institutions to conduct an in-depth case study of their STMSP. The purpose of the site visits was to obtain detailed descriptions of the programs in operation and to collect more extensive information from program administrators, staff, and STMSP trainees to supplement the data from the mail survey. The site visits were conducted by one staff person over a 2-day period between the months of July and August 1997. KRA staff conducted in-person interviews with the STMSP directors, research faculty, and staff who served as mentors, selection committee members, coordinators, or lecturers. One-hour focus group discussions were also held with trainees who were participating in the program at the time the site visits were conducted.

The characteristics of each of the five institutions selected for the case study site visits are shown in Exhibit 7-1. As noted in the exhibit, the institutions included four universities—three affiliated with a medical school, and one research hospital. Three of the institutions were funded by the Institute's Division of Heart and Vascular Diseases, one was funded by the Division of Lung Diseases, and another was funded by the Division of Blood Diseases and Resources. All of the institutions began serving trainees in the early 1990s; one began their summer training program in 1991, two began in 1992, one began in 1993, and another began in 1994. While all the institutions targeted their services toward undergraduate students, one institution also served health professional students. The exhibit also shows the geographic distribution of the institutions. As indicated, sites were selected in the midwestern, southeastern, southwestern, northeastern, and western regions of the country.

The remainder of this section summarizes the results of the case study site visits and provides an overview of the STMSPs, descriptions of the STMSP components, staff and trainee perceptions of the STMSP, and faculty and trainee recommendations for improving the STMSP. The case study site visit schedule, the topic guides used for both the interviews and focus group discussion, as well as the individual site visit reports are presented in Appendix B.

7.1 OvervieW of the Short-Term Training for Minority Students Program

7.1.1 Historical Background

Each of the programs selected for the case study began serving trainees in the early 1990s. The oldest of the five programs, Yale University, was among the first institutions to receive an award when the STMSP was initiated in 1991. At the time of the site visits, this STMSP along with one other, Creighton University, had received a second 5-year award. The other three institutions, Medical University of South Carolina (MUSC), Children's Hospital of Oakland Research Institute (CHORI), and the Texas College of Osteopathic Medicine (TCOM), were all nearing the end of their first 5-year award, but staff of these programs stated that they planned to resubmit applications to the program.

Exhibit *7-1*

Characteristics of Case Study Institutions

Institution	Institution Type	NHLBI Division	Year of Initial Award	Level of Tr Se~e
Creighton University	University	Heart	1992	Undergradua Health Profe Student
Medical University of South Carolina	University	Heart	1992	Undergradua
Texas College of Osteopathic Medicine	University	Heart	1993	Undergradua
Yale University School of Medicine	University	Lung	1991	Undergradua
Children's Hospital Oakland Research Institute	Hospital	Blood	1994	Undergradua

7.1.2 Institutional Linkages

With one exception, all of the STMSPs visited were implemented within a university setting and were administered by one or more divisions or departments within the institution. For example, programs at both Creighton University and TCOM were jointly administered by one of the institutions' departments of science (e.g., Department of Biomedical Sciences) and an office designated specifically to address minority issues, such as the Office of MultiCultural Affairs or the Office of Minority Affairs. Similarly, the MUSC program was under the joint auspices of the College of Graduate Studies and the Department of Biochemistry within the College of Medicine. The STMSP at Yale was administered solely by the Office of MultiCultural Affairs. The only program that had a completely different administrative structure was the CHORI program. This STMSP is one of only three of the 42 STMSPs nationwide that was implemented within a hospital setting and is a joint collaboration between the hospital's research institute and the Molecular and Cell Biology Department of the University of California at Berkeley (UC Berkeley).

Regardless of their administrative structure, all of the STMSPs appeared to have strong institutional linkages and support. For instance, each STMSP has one or more persons who provide administrative support to the program. These staff are salaried employees of the grantee institutions, and the time they spend on activities related to the program is not compensated under the STMSP grant. Several institutions also provide direct financial support to the STMSP. For example, Yale provides additional funds to cover trainee lodging, and in previous years, the University also provided monies to cover the students' meals. Administrators from CHORI and TCOM solicited outside contributions to support additional students' participation in their programs—beyond the number supported with the NHLBI funds.

It should also be noted that three programs—MUSC, CHORI, and TCOM—are part of a larger training effort at their institutions. The STMSP at MUSC is integrated into a larger initiative known as the Summer Undergraduate Research Program (SURP) that receives funds from at least two other grants that support research training for students, including one that targets minority students. Similarly, the CHORI program is subsumed under the Summer Research Intern Program. This program includes trainees funded under the STMSP as well as those from UC Berkeley's Biology Scholars and Biology Fellows programs, all of which target minority students. The STMSP program at TCOM also operates within the context of a larger program, the Summer Minority Advanced Research Training Program. However, this program is open to any student because State law prohibits the institution from operating a program that gives preference to a particular group of students. While the STMSPs at these institutions share administrative and program resources with other grants operated under the parent program, the relationships are supportive and they do not appear to compete with one another for institutional priority or assistance.

Yale and Creighton's STMSPs are not part of a larger university effort, but they have been renamed locally. The Yale program is known as the BioSTEP and the Creighton program is known as the Summer Research Training for Minority Students program. While these STMSPs function as separate programs within each institution, they have strong connections

to other summer research programs operated by the grantee institution; but these programs focus on different populations or levels of trainees. For example, both STMSPs have programs that also serve minority high school students with whom they share staff. laboratory space and equipment, or host joint activities. Yet these relationships are also supportive and because of the difference in program focus, they are not competitive.

7.1.3 Structure of the STMSP

Four of the STMSPs included in the site visits only serve undergraduate students, while Creighton serves both undergraduate and health professional students. Although MUSC currently serves undergraduate students only, they indicated that they will request additional slots to also serve predoctoral students when they submit their competing renewal application. Though Yale also limits its program to undergraduate students, they planned initially to include both graduate and medical students in their program. However, shortly after the award was made, they opted to provide services to these students through a research grant supported by the university.

With one exception, changes have also been made in the number of slots awarded to each STMSP. In their renewal applications, both CHORI and Yale requested funds for additional slots that resulted in a doubling of the number of trainees served. These STMSPs now serve a total of 10 and 24 trainees per year respectively. MUSC staff indicated that when they reapply for funding, they also plan to request funding for five additional slots. If approved, the total number of slots for the program will be 11. TCOM continues to have slots for 10 trainees; however, the number of slots awarded to Creighton was reduced. During the first 5 years of operation, Creighton had a total of 10 slots that they had difficulty filling. Therefore, when their renewal application was submitted, they requested funding for only 8 slots.

The number of staff involved in the operation of the STMSPs varied greatly. For instance, the number of overall STMSP staff, i.e., any individual who provided STMSP-related services, was as many as 54 (MUSC) and as few as 15 (Creighton). Similarly, the number of mentors also varied across institutions depending on the number of trainees in the program. For example, MUSC had a total of 6 mentors, while there were a total of 23 mentors available at CHORI.

7.2 Description of the STMSP Components

7.2.1 Recruitment

All of the STMSPs indicated that various methods are used to recruit prospective trainees, including presentations at research symposia/science fairs, visits to targeted schools, announcements in newsletters/scientific journals, and distribution of brochures and flyers announcing the program. MUSC also utilizes the services of the campus recruiter to promote the STMSP and also advertises on the Internet. However, the majority of the program directors stated that direct referrals from either former trainees, faculty, and/or other institutions are the most effective recruitment methods. In fact, all of the STMSPs have

established linkages with various institutions in order to recruit potential trainees. CHORI relies on its connection with the biology programs at UC Berkeley as a main referral source. while the other four institutions have ties to several Historically Black Colleges and Universities (HBCUs) to promote recruitment, including Benedict College. Jarvis Christian College, Morehouse College, Savannah State College, Spelman College. Southern University, Paul Quinn College, Talladega College, and Xavier University of Louisiana.

All of the STMSPs extend their recruitment efforts nationally, with the exception of MUSC. They only recruit from institutions east of the Mississippi. Also, while Yale. Creighton, and CHORI recruit on an annual basis, recruitment at MUSC and TCOM is ongoing throughout the year. It should also be noted that while MUSC limits its recruitment to Blacks, both Yale and TCOM target Blacks and Hispanics. However, Creighton and CHORI target all minorities who are eligible for the program (Blacks, Pacific Islanders, Hispanics, Native Americans, and Alaska Natives). Some programs (Yale and Creighton) indicated that they would prefer that former trainees not reapply to the program because they do not feel a second experience would be beneficial.

Four of the programs did not experience problems recruiting trainees, and in fact often had more qualified applicants than slots available. However, even after Creighton reduced its number of slots from 10 to 8, during the summer of 1997, staff were able to fill only 6 of the 8 awarded slots.

According to the programs included in the site visits, while efforts have been made to either target more individuals of a particular minority group or expand the geographic scope of recruitment, few changes have been made in the recruitment strategies used. However, to avoid having to compete for trainees with other related programs, Yale began to recruit applicants earlier in the year.

7.2.2 Trainee Selection

All of the STMSPs use a committee comprised of program staff and faculty to select trainees. The committee, which is usually designated by the STMSP director, is responsible for reviewing and initially ranking each of the applicants. All prospective trainees are required to submit a formal application, two to three letters of faculty recommendation, and a personal statement explaining why they are interested in the program. The trainees' GPA is considered in the process of ranking trainees and the weight it is given varies across programs. It is the most influential factor in the selection process for both Yale and MUSC but the other institutions placed a greater emphasis on trainees' expressed interest in the program. In addition, programs at both MUSC and CHORI considered applicants' ethnicity because these programs also serve nonminority students. Therefore, applicants are asked to indicate their ethnicity in their applications so staff can make sure that the trainees selected to participate in the STMSP are in fact underrepresented minorities. However, TCOM is prohibited by State law from specifically requesting this kind of information, so individuals applying to this program are also required to submit a photograph of themselves. Therefore, even though the program is open to students of any ethnicity, staff can ensure that the trainees who are selected represent a diverse group.

Once the committee has completed its review, its recommendations may be reviewed again by the STMSP director and a member of the administrative staff. For instance, after the committee reviews and ranks the applications, final selections are made by the STMSP director at Creighton, and the STMSP principal investigator and the SURP director make the final selections at MUSC. However, the CHORI director, along with the program coordinator, also conduct personal interviews with the top 15 students before selecting the final 10 trainees.

Staff have not had any problems retaining trainees once they begin the program. However, occasionally some trainees may decline the offer to participate in the STMSP because they accepted admission into another program. In this case, programs select from among trainees who have been placed on the alternate list.

7.2.3 Research Experience

On average, the STMSPs operate from 10 to 12 weeks between the months of June and August and provide full-time research training experiences. While all of the programs offer training experiences associated with heart, lung, and blood health and diseases, some programs also have projects that include other areas such as pharmacology, environmental sciences, or biology. All of the programs also offer projects that involve basic as well as clinical research training, with the exception of Creighton, which only had basic research projects. However, the number of projects available varies across institutions. For instance, both Yale and CHORI had well over 150 projects available, while Creighton had 17 projects, TCOM had 30 projects, and MUSC had 50 projects.

The process for assigning trainees to projects also varies. Most of the institutions provide trainees with a list of available projects and ask them to identify at least three projects that are of interest to them. Program staff, in turn, use this information to match trainees to a particular project and mentor. Similarly, the director at Yale assigns trainees to projects based on their preferred areas of interest. But these trainees do not have the advantage of reviewing a list of available projects and instead are asked to identify their interest in their personal statements. In contrast, the assignment decision at MUSC is left to the trainee. This program provides trainees with a list of available projects during the application process and after trainees are selected, they are encouraged to meet with prospective mentors to learn more about the available projects. Following the meetings, the trainees decide which project they would like to be assigned. If it appears that the match between the trainee and the project or mentor is not satisfactory, all of the programs allow trainees to be reassigned.

Trainees at each of the programs are assigned to work with only one individual who functions as their mentor. While the mentors are responsible for the overall supervision and monitoring of trainees' progress, depending on the structure of the projects themselves, trainees often may work under the direction of a graduate student or postdoctoral individual on a daily basis. Generally, only one STMSP trainee is assigned to a project. The type of responsibilities trainees are given also varies with the nature of the project they are assigned. Most of the basic research projects offer trainees experience in preparing various specimens/solutions, using different types of scientific instruments, collecting and analyzing

data, as well as conducting literature reviews and preparing oral presentations. Tasks given to trainees who are assigned to clinical research projects may also include developing study protocols or questionnaires and conducting patient interviews. In addition, some programs require trainees to prepare written reports both during and at the end of the project. For instance, MUSC trainees have to develop a written proposal describing what they want to accomplish on their projects and a final written report on their research experience. CHORI trainees also have to prepare a written research plan and final report as well as bimonthly wntten progress reports.

Once the projects are completed, if the institution is the home school of the trainee, the trainee may be allowed to continue his or her research project during the academic year. In fact, MUSC students can eam 15 hours of academic credit if this option is selected.

7.2.4 Enrichment Activities

The STMSPs provide various enrichment activities to enhance trainees' learning experiences. These may include seminars/lectures, grand rounds, or trainee discussion groups. All the programs provide seminars to trainees. Some are designed specifically for the STMSP participants and others are open to the general academic community. Seminar topics tend to vary from year to year but they focus basically on either scientific presentations or sharing information about education and careers in the biomedical and behavioral fields. It should be noted that while none of the programs require trainees to attend the seminars/lectures or grand rounds, trainees at TCOM can receive 1-hour credit for seminar attendance.

Programs affiliated with a hospital, such as Yale and CHORI, also offer trainees the opportunity to accompany staff on rounds to leam about patient care. While trainees in the Yale program must make their own arrangements for this activity, it is open to the general hospital community at CHORI. Both of these programs also have regularly scheduled discussion groups that are organized to give trainees an opportunity to meet with other trainees and staff and share information about their research experiences. However, unlike the seminars or grand rounds, participation in this activity is mandatory.

In addition, some programs (CHORI, Yale, and MUSC) provide a host of social activities designed to give trainees an opportunity to interact with one another as well as with program staff in a relaxed setting. These activities may include welcoming lunches/dinners, outings to local places of interests, or an end-of-program barbecue/picnic. To help ensure that trainees have time to spend with one another, CHORI staff have also designated an area of the hospital as a "student lounge" so trainees can have a place of their own to meet informally for lunch or during breaks.

7.2.5 Evaluation/Tracking Process

Several programs conduct formal evaluations to assess trainees' performance. For instance, the TCOM director and mentors conduct pre- and post-program assessments of trainees to test their knowledge of particular topic areas, while MUSC and Yale mentors are required to complete a written evaluation on trainees' overall performance at the end of the program.

Mentors who are part of the CHORI program also complete trainee evaluations, but these evaluations are optional. A few programs, such as CHORI and MUSC, also have trainees complete an exit survey that is used to help assess the STMSP. In addition to the formal evaluations, efforts are made to provide informal feedback on trainee performance throughout the program either through regularly scheduled meetings with mentors and/or other project personnel as well as through the discussion groups referenced above.

All of the STMSPs have instituted procedures to track trainees once they complete the program. These may involve staff contacting trainees by telephone and/or mailing questionnaires. This followup activity is conducted on an annual basis to obtain current address information on trainees and educational and employment status. Both CHORI and TCOM also use this process to collect information on the program's impact on trainees' career choices. In addition to efforts initiated by program staff, attempts are made to obtain these types of data from trainees who contact the program for education or employment related references. Once collected, information is maintained either manually or electronically by program staff.

7.3 Perceptions of the STMSP

7.3.1 Staff Perceptions

7.3.1.1 Degree of Program Success

Across the board, STMSP staff believed the program was very successful. In particular, staff stated that the STMSPs had been successful in increasing trainees' knowledge of career opportunities available to them in biomedical and behavioral research. For instance, some staff stressed the fact that program participation has helped to transform trainees' abstract understanding about careers to. something concrete and realistic.

However, other staff noted that many undergraduate and graduate students are not sure about their career goals, so more attention needs to be given to this area. The majority of staff also stated that STMSPs were successful in helping to enhance trainees' research skills, especially given the fact that prior to the program, many trainees had never worked in a research laboratory. Still others indicated that success in this area was marginal, because it generally takes longer than 10 weeks to develop the skills trainees need.

In terms of its success in helping trainees develop a sense of belonging to the scientific community, some staff noted that the program has given many trainees the opportunity to not only meet and interact with numerous faculty and research staff, but also the chance to help co-author scientific publications. Former trainees from MUSC are also invited to return to the university to present at its annual research forum. Yet staff at other institutions pointed out that while participation in the program is the beginning of this process, trainees needed to take it upon themselves to begin making the transition from thinking of themselves only as students to also thinking of themselves as scientists. Concern was also expressed about the fact that while most faculty and staff are very receptive to the trainees, sometimes trainees end up working under the direction of a graduate student or a postdoctoral individual

and are possibly paired with someone whose personality does not mesh with theirs. As a result, their feeling of being connected to the scientific community may be thwarted.

Most staff believed that the STMSPs have been successful in encouraging trainees to pursue degrees in the biomedical and behavioral sciences. In addition, some staff stated that the number of trainees expressing an interest in attending graduate school has increased and some who had planned to attend medical school opted to pursue doctorate degrees in the biomedical or behavioral sciences. Yet, other staff stated that the program has only been somewhat successful in this regard since most trainees were already on this track when they entered the program. Similarly, staff stated that the program has only been fairly successful in stimulating trainees' interest in a biomedical or behavioral research career. For instance, while some staff agree that exposing trainees to individuals who have successful research careers provide encouragement that the same objectives are possible for them, others reported that while some trainees have expressed an interest in biomedical or behavioral research careers, most are set on having careers in clinical medicine rather than research. However, all staff concluded that the program has been a positive experience for trainees, and even those who questioned its success in certain areas conceded that it will help make those who are pursuing degrees in medicine better physicians.

7.3.1.2 Implementation Facilitators

Staff noted that several factors have contributed to the successful implementation of the STMSPs across grantee institutions. Most notable was having a committed staff and strong program leadership. Other contributors to program success included having a recruitment specialist, a talented pool of applicants, a broad range of research opportunities, institutional support, and a program that is centrally organized.

7.3.1.3 Implementation Barriers

Staff identified several barriers that were considered impediments to a successful program. The major barriers were lack of adequate funding and available mentors. For instance, several staff noted that it has often been difficult to secure the support of committed individuals to serve as mentors in the program, particularly since the program only operates during the summer months. Moreover, while many individuals may be interested in serving as mentors, because they cannot afford the cost of equipment and supplies needed in the lab for STMSP trainees, they are unable to do so. Other implementation barriers included the lack of trainee housing, the inability to find enough qualified applicants, especially those who have a genuine interest in research, limitations imposed by the length of the program, and the fact that the program is organized so late in the year it prevented trainees from having a chance to get settled before it began.

7.3.2 Student Perceptions

7.3.2.1 Overview of the Focus Group

As noted earlier, 1-hour focus group discussions were conducted with trainees who participated in the STMSPs during the summer of 1997. All trainees who participated in the STMSP were included in the focus groups with the exception of those who participated in the program at Yale. As proposed in the research design, the focus group was limited to no more than 10 participants per institution. Since Yale served a total of 24 trainees, only half of the trainees from this STMSP were selected to participate. As a result, 41 trainees participated in the focus group: 33 women and 8 men. The racial/ethnic composition of the groups included 26 Blacks, 8 Hispanics, 5 Asians, and I Caucasian student. The ethnicity of one trainee was unknown. Trainees' academic status ranged from sophomore to first year health professional student and, with the exception of one student who majored in linguistics, all trainees were pursuing degrees in either the biomedical or behavioral sciences.

7.3.2.2 Recruitment and Selection Process

Trainees indicated that they leamed about the STMSP through a variety of sources, including direct referrals from faculty or former participants, the Internet, attendance at a research conference, listings posted at their home institutions, and a family friend. Trainees also revealed that they were all required to submit a formal application, two to three letters of recommendation, a personal statement, and a copy of their transcript. The majority of trainees thought that the overall recruitment and selection process was fair and competitive. However, a few felt the process was not fair because personal interviews were not conducted and it was easy for applicants to misrepresent themselves on paper. As noted earlier, CHORI is the only program that includes personal interviews as part of the selection process. Nevertheless, trainees concluded that because the cost of conducting personal interviews would probably result in fewer dollars to support the training experiences, the current process was the only feasible way to select participants. Some trainees indicated that they were told initially that they had not been accepted into the program but put on a waiting list. However, they stated that they were pleased to learn that their applications were reconsidered later and they were eventually invited to participate in the program.

It should be noted that although the trainees leamed about the program from various sources, during the course of the focus group discussions, trainees from each of the programs acknowledged that they were not familiar with the STMSP per se nor the fact that it was affiliated with the NHLBI. Rather, trainees only knew the program by its local name (e.g., BioSTEP or SURP) and viewed it as an initiative that was both administered and funded by the grantee institution.

7.3.2.3 Research Experience and Enrichment Activities

Trainees stated that they had varying experiences with regard to the research assignment process. Most trainees indicated that they were given a choice in their assignment particularly since they were asked to indicate their preference for projects. Moreover, the majority of trainees were assigned to the projects they wanted including those who started the program late. However, some trainees stated that they should also have had the opportunity to interview prospective mentors before a final decision was made. In addition, some trainees said that while they were given a choice in their assignments, the choices were limited. A few trainees complained that they were not assigned to the projects they wanted because there were no mentors available with projects in those particular areas. As a result, these trainees were assigned to their second choice.

Regardless of their assignments, all of the trainees stated that they were aware that if their assignments were not satisfactory, they could request a change. In fact, one trainee did request a reassignment. This trainee did not wish to elaborate on the circumstances regarding the change but expressed satisfaction with the new project.

Trainees' responsibilities varied depending on the nature of their assignments, but they generally included preparing solutions/specimens, conducting experiments, developing survey instruments, collecting data, and interpreting and analyzing data. Quite a few trainees also stated that they spent time conducting literature reviews or library study to become more familiar with their projects and research area. All of the trainees expressed satisfaction with their projects and felt that the experience they were gaining was invaluable. Several commented on how the experience helped to enhance what they learned in the classroom.

In addition to the research assignments, trainees explained that each of the programs also provided enrichment activities such as seminars, guest lectures, grand rounds, group discussions, and social activities. However, trainees had varying opinions about the usefulness of these activities. For instance, some trainees thought the activities were very beneficial, while others were less enthusiastic about them and felt the time spent on them detracted from time that could be spent in the laboratory. But a few trainees conceded that they wished they had taken more advantage of them. All the trainees enjoyed the social activities, but the general consensus across institutions was that there was a need for more so trainees could have greater opportunities to interact with one another.

7.3.2.4 Mentoring and Evaluation

The majority of trainees stated that they had very positive relationships with their mentors, but the level of contact with them varied greatly. For instance, some trainees saw their mentors daily and worked very closely with them, while others were under the direct supervision of postdoctoral individuals or graduate students and only saw their mentors a few times a week. Still others tended to work independently and only saw their mentors when needed. However, a few trainees expressed concern that their mentors were too busy and rarely available to them. Nevertheless, all of the trainees agreed that having a mentor to work with was beneficial and those whose experiences were positive stressed the fact that

they leamed a lot from their mentors and their transitions into the laboratory would not have been possible without them. Those trainees who worked closely with postdoctoral individuals or graduate students also expressed appreciation for their help and guidance but stated a preference for having a mentor.

In terms of evaluation, most trainees indicated that they were either evaluated informally during the program by the mentors or during group meetings, or formally by the mentors at the end of the program. Some trainees also stated that they were asked to evaluate the program.

7.3.2.5 Future Plans

All of the trainees indicated their intent to either attend graduate or health professional school. In most cases, trainees stated that these were their plans when they entered the program. However, in some instances, trainees who were planning to pursue an M.D. degree explained that after participating in the program, they were also considering getting a Ph.D., and a few others, whose initial plans were geared towards research, said the program helped them to crystallize their decisions. On the other hand, some trainees indicated that the program helped them to realize that they did not want to pursue research careers and were now confused about their future.

7.3.2.6 Level of Satisfaction

Overall, trainees were very satisfied with the STMSP. In particular, trainees noted that the most satisfying aspects of the program were the training experiences, the independence afforded them in carrying out their projects, and meeting and interacting with other trainees, their mentors, and the laboratory staff Areas they were not satisfied with included the seminar/lecture series; lack of immediate feedback on their progress; too little time with their mentors; the length of the program (not long enough); few opportunities to interact with each other; little patient contact; working with patients who were in acute pain; limited access to institutional resources; facing problems with logistics such as housing, meals, and the distribution of checks; and the STMSP stipend amount.

7.4 Faculty and Trainee Recommendations

This section summarizes recommendations from both faculty and trainees about ways in which the STMSPs could be improved.

7.4.1 Program Faculty and Staff

Recruitment

- Allocate more dollars for recruitment efforts in order to reach **a larger** audience of prospective applicants.

- Form more partnerships with outside institutions and attend more conferences where a significant number of minority students are present.

- Begin the recruitment process earlier in the year.

- Target individuals who have a definite interest in pursuing research or a combination of research and medicine versus those interested only in medicine.

- Develop specific recruitment efforts to target minority men, particularly Black men.

- Direct more recruitment efforts to target students at the high school level.

Selection

- Select only those individuals who have an expressed interest in research.

- For institutions that have an integrated program that includes the STMSP, make sure that the selection committee is aware of the total numbers of slots allocated for each program.

- Require that faculty letters of recommendation be more focused and provide more detail on trainees' abilities.

Research Assignment

- Provide information to trainees on available projects prior to the start of the program.

- Allow trainees to rotate in or visit all laboratories before the final assignment is made.

- Extend the length of the program to give trainees more time to complete their projects.

- Require all trainees to prepare written abstracts on their projects for presentation at the National Minority Research Symposium.

- Organize a faculty jury to review each of the projects and award prizes to the top three.

- Allow trainees to visit the program before it begins to become better acquainted with the mentors and their projects.

- Maintain efforts to focus on mentoring relationships.

- Make sure that trainees are given input into the assignment decision.
- Increase the number of available mentors.

Enrichment Activities

- Incorporate sessions on patient care into the program structure.
- Include activities that focus on career opportunities in biomedical and behavioral research.
- Offer enrichment activities during the evening/weekend, so trainees can spend more time in the laboratories.
- Provide a course to help trainees prepare for the GRE or MCAT.
- Formalize the seminars and include a session on medical arts, i.e., how to prepare slides for presentations.
- Have all trainees prepare writing assignments and make presentations.

Other Recommendations

- Provide formal notification about the deadlines for the renewal of the STMSP grant.
- Inform mentors about the funding source for trainees assigned to their laboratories.
- Provide information about various STMSPs for distribution among all grantees.
- Institute a uniform policy regarding the size of stipends for various research training programs to avoid competition for trainees.
- Provide monies to help cover the costs of program administrative staff and social activities for trainees.

7.4.2 Trainee

- Develop specific efforts to recruit a greater number of minority males.
- Provide an orientation to both the institution and surrounding community before the program begins.
- Provide more clinical research experiences.

- Provide information on available projects before the program begins.
- Include more diverse topic areas for the seminars/lectures and schedule seminars during the morning.
- Offer more activities that permit more trainee interaction.
- Increase the size of stipends.
- Pay stipends in advance to help trainees get settled.
- Provide more financial assistance to help cover the cost of housing and food.
- Hire more administrative staff to help run the program.
- Ensure the availability of committed mentors.
- Allow trainees the option of working with more than one mentor during the course of the program.

7.5 Summary and Conclusions

While all of the STMSPs began serving trainees in the early 1990s, currently they are either in their second 5-year cycle of operation and/or just completing the first 5-year cycle and in the process of applying for additional funds. Throughout the course of their operations, the programs seemed to have been successful in establishing strong institutional linkages as is evidenced by the amount of support they received internally. While this support primarily has been in the form of staff assistance, as noted earlier, some institutions also provided monies to cover the costs of trainee housing and assisted in efforts to secure outside monies to subsidize the costs of having additional trainee slots.

In addition to having strong institutional linkages, the STMSPs also appear to have well-established ties to other research training programs operated by the grantee institution. In some instances, the STMSP is totally integrated under a large umbrella program and operates as just one of several options available to trainees as was noted with the MUSC, CHORI, and TCOM programs. Or the STMSP may function as a separate program but share various resources such as staff, laboratory facilities, and host joint activities. In either case, the STMSP has formed cooperative relationships with other programs and they do not appear to compete for institutional priority or resources.

While the STMSP is open to undergraduate, graduate, and health professional students, the results of the case studies indicate that the majority of programs only focus their attention on undergraduate students. Also, although the program is designed to serve Blacks, Hispanics, Native Americans and Pacific Islanders, most programs target Blacks primarily. However, some programs also serve groups (i.e., Asians and Caucasians) who are not eligible for the program. Given these differences, it appears that there is a need to provide clearer guidance to programs regarding STMSP eligibility policies and perhaps some direction on how programs might reach a larger audience of prospective

trainees. It was noted that few minority males participate in the program, therefore, particular action is needed to increase their participation.

For the most part, the STMSPs have been successful in recruiting sufficient numbers of trainees and. in fact, often have had considerably more applicants than the number of slots available. As a result, some of the programs have requested an increase in the number of slots awarded to them thus, in some cases, almost doubling the number of trainees they serve. Also, while the programs use a variety of recruitment strategies, direct referrals from former trainees, faculty, and other institutions, particularly HBCUs, appear to be the most effective method for ensuring that the programs have a steady flow of qualified applicants. Perhaps these linkages could be expanded to help address the problems of ensuring that more minority males apply to the program. For instance, STMSPs might also consider establishing contacts with local organizations at these institutions, such as fraternities or science-related honor societies to help generate more interest among male students.

The process used to select trainees is fairly uniform across sites, although some conduct personal interviews with trainees as part of the process. However, given the high cost of personal interviews, this may only be feasible for those programs that have a fairly localized recruitment process. Nevertheless, the process seems fair and competitive since efforts are made to consider both trainee interest as well as ability.

The programs tend to offer trainees a broad range of basic and clinical research experiences that not only encompasses projects associated with heart, lung, and blood health and disease, transfusion medicine, and sleep disorders but other areas such as pharmacology or biology. Also, while assignment to the projects are determined primarily by program staff, efforts are made to match trainees to projects they have an interest in. If trainees are not satisfied with their project, they can request a reassignment. Although the type of responsibilities given to trainees varies with the nature of the project, it appears that a concerted effort is made to ensure that trainees are given tasks that will help them develop solid research skills. Enrichment activities are offered to help enhance trainees' learning experiences, and social activities are also provided.

While most programs evaluate trainee performance, the formality of this activity varies across institutions. While all programs have procedures for tracking and maintaining contact with former trainees, the extent to which these efforts include an assessment of the program's impact on trainee educational and career decisions varies. Again, given the variation that exists in both of these areas, more uniform policies that delineate what type of evaluation/tracking should be conducted, by whom, and with what frequency would not only help to ensure the program meets its goals in terms of enhancing trainee skills, but it could also be used to make needed program modifications.

Overall, staff had differing opinions as to the success of the STMSPs. While most generally agree that the program has helped to increase trainees' knowledge about careers in the biomedical and behavioral sciences, has helped to enhance their research skills, and has helped them to feel connected to the scientific community, success in these areas has been somewhat limited. Similarly while staff agree that the program has had some impact on trainees's education and career goals, some contend that the career goals of the majority of trainees have not changed as a result of participation in the STMSP. Staff concluded that participation in the program has been a positive

experience for all trainees and even those who are moving forward with their plans to pursue a degree in medicine will be better physicians as a result of their participation in STMSP.

In terms of those factors that have affected the program's implementation, having committed program staff and strong program leadership were seen as the major facilitators of the STMSPs' success. The lack of adequate funding and not having enough available mentors were noted as the major barriers.

The focus group discussions indicated that trainees leamed about the program from a variety of sources and confirmed that the application and selection processes described earlier were generally fair and competitive. However, there is a need to ensure that both staff and trainees are aware that the STMSP is a separate, distinct program funded by the NHLBI. During the course of one of the faculty interviews, it was clear that even the staff person was not aware that the student she mentored was funded under the STMSP grant. Furthermore, as noted earlier, the focus group discussions revealed that none of the trainees was familiar with the STMSP per se or its affiliation with the NHLBI.

The focus group discussions also confirmed the process used to assign trainees to projects, the type of responsibilities they are given in the laboratories, and the kinds of enrichment activities that are available to them. All of the trainees were very satisfied with their research experiences, but some did not find the enrichment activities to be useful, particularly the seminars.

Most trainees also were satisfied with the relationships they formed with their mentors, but several expressed a need to have more direct contact with them. However, in some instances, the trainee-mentor relationship was not satisfactory because trainees felt the mentors were too busy. Therefore, it appears that there is a need for greater consistency across programs in terms of the level of mentor involvement.

Finally, the focus group discussions also suggest that the STMSPs have been successful in meeting their goals of exposing trainees to a broad range of research experiences and in fact, has helped some trainees to recognize biomedical and behavioral research as a viable career option. Moreover, even trainees who noted that they still intended to pursue careers in medicine or those who were not sure what they wanted to do, ultimately considered the program to have been a great learning experience.

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Section 8

Findings and Recommendations

Section 8

Findings and Recommendations

The ultimate objective of the STMSP evaluation was to assess whether the program was having the effect of encouraging more minority students to seek careers in the biomedical and behavioral research fields in areas related to heart, Lung, and blood health and disease, transfusion medicine and sleep disorders. As discussed previously, the evaluation is somewhat limited in its efforts to address the extent that STMSP participants are actively involved in biomedical and behavioral research careers (see Section 2.4). However, it can assess how successful the program has been along certain other key dimensions. In particular, the results can help to address the extent to which the STMSPs are, in fact, recruiting a significant number of qualified minorities to participate in the program, providing quality research experiences to trainees, and affecting trainee education and career decisions. Further, findings from the study can help identif~r areas of change that may help improve the program's overall operation and effectiveness. The following section presents a summary of the findings and recommendations from both the mail survey of STMSP staff and participants and the case study site visits.

8.1 Findings

8.1.1 STMSP Recruitment and Selection Process

The STMSPs are successful in their efforts to attract highly qualified minority individuals both in terms of their academic performance and career interests.

The STMSP was effective in recruiting minority females into the program. The majority of all trainees and two-thirds of the undergraduate students were minority females (Table 3-1). It should be noted that this is not necessarily a result of the STMSP selection process since the survey results confirm that a higher proportion of trainees than applicants were male, even though the difference in the gender distribution of these two groups was not statistically significant (Table **4~1).1**

- All of the program directors expressed satisfaction with the qualifications of the applicants. Almost three-quarters of the program directors also said that they were very satisfied with the overall recruitment procedure (Table *5-8).*

Tests of statistical significance on the distributions of race and GPA between the applicant and trainee populations were conducted (Tables 4-2 and 4-3). The results indicated that the distributions were significantly different. The average GPA for the trainees was higher than that for the applicants. Given these findings, the applicants may not be an appropriate comparison group.

Further, over 90 percent of the faculty and staff who were involved in the selection process indicated that they received enough or more than enough applications from qualified individuals; only one respondent reported that this was not the case. (Table 6-4).

- By grade point average (GPA) and academic background, both the trainees and applicants appeared to be qualified individuals, but trainees were more qualified than applicants using only the reported GPAs (Table 4-3).

- STMSP trainees included individuals who were pursuing degrees in the biomedical and behavioral sciences as well as other academic majors. Although over three-quarters of the undergraduate students indicated that they were biological and/or health science majors, the remainder were from other academic areas, including the Arts and Humanities (Table 3-7). Further, about one-quarter to one-half of the trainees, depending on their academic levels (undergraduate, graduate, or health professional student) were considering a research-oriented program or career, and 11 percent of the undergraduate students had given little or no thought to a research career (Table 3-8) at the time of STMSP application.

- The case studies support the finding that the STMSP includes individuals who major in academic areas related to biomedical and behavioral science, but also other disciplines as well.

- The STMSP is targeting underrepresented minority individuals; however, the case studies indicate that some of the trainees are members of ethnic groups who are not eligible for the program (in particular, Asians and Caucasians.) While the survey also supports the fact that some trainees are Caucasian, it was not possible to separate these data for Asian individuals because this category is combined with Pacific Islanders (Tables 3-2 and 4-2).

8.1.2 Quality of Research Experiences

The STMSP is successful in its efforts to expose trainees to a broad range of quality research experiences associated with heart, lung, and blood health and disease, transfusion medicine, and sleep disorders, as well as related areas.

- While the majority of all trainees who participated in the survey had research experiences associated with heart, lung, and blood health and disease, transfusion medicine, and sleep disorders, almost one-third were assigned to research projects in related areas (Table 3-12).

- The focus group findings also indicated that STMSPs offer trainees both basic and clinical research experiences that not only encompass projects involving heart, lung, and blood health and disease, transfusion medicine, and sleep disorders, but other areas as well.

- Over 80 percent of the trainees were satisfied with their STMSP research project assignment (Table 3-14). Specifically, 42 percent of the undergraduate and health professional students were very satisfied with their research project assignments, as were 52 percent of graduate students.

- Over 90 percent of all trainees indicated that they were satisfied with the manner in which their STMSP research project was assigned with over 60 percent of the undergraduate and health professional students and 85 percent of the graduate students indicating that they were very satisfied with their STMSP research assignment process (Table *3-25.)*

- The case study site visits confirmed that trainees are extremely satisfied with their research experiences, and although the option of reassignment is available, it is rarely used.

- Ninety-one percent of the undergraduate students, 100 percent of the graduate students, and almost 90 percent of the health professional students indicated that they were satisfied or very satisfied with the level of financial support received while in the program (Table 3-34). Given that there was somewhat less satisfaction among the health professional students in this area, this may suggest that differential levels of support for the various categories of students may be appropriate.

8.1.3 Level of Mentor Involvement

Overall, trainees were satisfied with their level of mentor involvement and believed the mentors helped to encourage their interest in biomedical and behavioral research.

- Sixty percent of the trainees indicated that they had contact with their mentor three or more times per week during the program (Table 3-20). Forty percent indicated that they had contact with the program director one or two times per week. Over one-third of the trainees indicated they had contact with STMSP research faculty and staff as well as other faculty and staff three or more times a week. Over 20 percent also indicated they had contact with these staff at least once a week.

- Substantial proportions of trainee and staff contacts *(45* to 67 percent) were related to discussions about the availability of research positions, pursuit of a specialization, requirements for biomedical careers, multiple career paths, and the recognition and compensation associated with a research career (Table 3-21).

- The case study focus group discussions revealed that most trainees were satisfied with their mentor relationships. In some instances, trainees wanted the level of contract to be greater, but believed that having an assigned mentor was helpful.

8.1.4 Influence on Trainee Education and Career Decisions

The STMSPs are positively affecting trainee education and career decisions.

- Over 70 percent of the undergraduate students indicated that their STMSP experience had an effect on their career choice (Table 3-23). More than 40 percent of the undergraduate and graduate students indicated that participation in the program affected positively their employment choices and areas of specialization, and over half replied that it affected their decisions about graduate training. As might be expected, the proportion of the distribution for these variables was lower for trainees who were already in health professional schools, although almost half said that their STMSP experience affected positively their career choice and almost one-third indicated that it affected their decisions regarding graduate training.

- Subsequent to the program, in terms of progress made toward attainment of a degree, similar proportions of trainees and applicants had completed some or all course work or had completed qualifying exams (Table 4-6). However, a lower proportion of trainees were employed either full- or part-time at the time of the survey (Table 4-9), reflecting their continuing education.

- The case study findings revealed that most of the trainees who participated in the focus group discussions did not have an interest in pursuing a research career before the STMSP. However, following participation, several trainees indicated that the program had stimulated their interest in a research career or their decision to pursue a combined M.D./Ph.D. degree.

- The case studies also revealed that even trainees who had decided to pursue only medical degrees or those who were still undecided about their career goals considered the STMSP to have been a great leaming experience.

8.2 Recommendations for Improvement

While the above findings indicate that the STMSP has been successful in achieving many of its goals, the evaluation identified several areas where improvements can be made. Most suggestions for program improvements from both STMSP staff and trainees were presented earlier in this report under Sections 3 and 7. The following recommendations have program policy implications.

- If the NHLBI determines it is to attract more minority males, more emphasis on the recruitment of this group is needed. This may involve targeting institutions or organizations with particularly large male populations. However, it should be noted that, based on the results of the survey and case study site visits, the current selection processes seem to target potential male and female applicants equally. Therefore, any changes will have to focus on ensuring that a greater number of males apply to the STMSP.

- To address the concern of trainees who want, prior to the start of the program, more information about the potential research opportunities and the availability of projects and mentors, it may be beneficial to shift resources from on-site recruitment activities to in-person interviews at the STMSP institution. Therefore, trainees would have an opportunity to meet and talk directly with prospective mentors.

- Given the fact that some institutions are serving individuals from ethnic groups who are not eligible for the STMSP, there appears to be a need to provide clearer guidance to institutions regarding eligibility criteria.

- Although 60 percent of the trainees indicated that they meet with their mentors three or more times per week, the level of mentor involvement was one of the two most frequently mentioned areas for program change. The case studies also indicated some dissatisfaction with the level of trainee and mentor involvement. To address this area of concern, it might be helpful to provide some specific guidelines to grantees about the role of the mentors and their expected level of involvement in the program.

- Helping the STMSP to be identified more as a program (and less as a funding source, e.g., T35 M) may provide it with better recognition and more of an association with the NHLBI, as well as assist institutions in recruiting qualified applicants.

It is clear that the STMSP has had very positive short-term effects in its efforts to increase the number of minority students pursuing research careers in areas related to heart, lung, and blood health and disease, transfusion medicine, and sleep disorders. For instance, the program has undoubtedly been successful in attracting highly qualified minority individuals. In fact, not only has the STMSP attracted a significant number of qualified applicants; in most instances, the program has had greater numbers of qualified individuals applying to the program than slots available.

The STMSP has also been successful in its efforts to provide quality research experiences to trainees, and overall, trainees have been very satisfied with their experiences. Most trainees were satisfied with the level of mentor involvement and, in general, believed their mentors played a key role in encouraging and stimulating their interests in biomedical and behavioral research.

Finally, as stated previously, the evaluation could not address the long-term impact of the program's ability to influence significant numbers of trainees to enter careers in biomedical and behavioral research. However, the results do support the fact that STMSP participation has had a favorable influence on both trainee education and early career decisions. It is anticipated that future research would substantiate the program's direct impact on trainees' ultimate career choices.

As a final note, the results of the mail survey and case study site visits suggest that many trainees and even some staff did not recognize the "Short-Term Training for Minority Students Program" by that name. The case studies revealed the program is often known to trainees and staff by a local name or as part of a larger program with multiple funding sources, other parts of which may or may not be reserved for minority students. While this does not have an impact on the effectiveness of the program, it is an issue to be considered for future evaluations. Former trainees and applicants are less likely (or unable) to respond to questions about a program that they do not recognize.

* * * *

Appendix A

Data Collection Instruments

SURVEY QUESTIONNAIRES

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

PROGRAM DIRECTOR QUESTIONNAIRE

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)
PROGRAM DIRECTOR QUESTIONNAIRE

A. STRUCTURE OF THE STMSP

A1. Which of the following best describes this institution? ***Circle the number next to your answer.***

Hospital	
Clinic	2
Research Center	3
University—Circle ***"4" and answer question A1a below***	*4*

A1a. Does the university have any of the following? ***Circle all that apply.***

Master's programs in the biomedical sciences	1
Doctoral programs in the biomedical sciences	2
Medical school	3
Other health professional schools, such as public health or nursing—Circle "4" ***and specify below***	*4*

A2. In which year did this institution receive its initial STMSP grant?

Circle applicable year: 1991 1992 1993 1994 1995 1996

A3. How many weeks did each STMSP training program last?

1992 1993 1994 1995 1996

A4. How does this institution support the operation of the STMSP? ***Circle all that apply.***

Provides supplemental funding for trainees' expenses	1
Provides other resources in addition to grant requirements	2
Provides staff release time	3
Conducts followup of former trainees	4
Other—Circle "5" and specify below	5

AS. Has the level of resources (e.g., funding, research staff time, laboratory space, equipment) criange~ from that proposed in your STMSP grant application?

Yes, level of resources has **increased**	1
Yes, level of resources has **decreased**	2
No, level of support has remained the ***same—Circle "3" andsAip to question A6***	3

ASa. Briefly describe how the level of resources has changed.

A6. In the table below, enter the total number of biomedical research staff at your institution, the total number of STMSP staff, and the number of STMSP mentors participating in your program for each applicable year. STMSP staff are defined as those persons who provide STMSP-related services, including yourself, research faculty/staff, lecturers, instructors, selection committee members. etc. Administrative support personnel are not included in this definition. ***Please note that STMSP mentors should not be included in the total number of STMSP staff***

Enter the number of:	1992	**1993**	1994	1995 11996
Your institution's total biomedical research staff				
Your institution's total STMSP staff:				
Your institution's STMSP mentors:				

A7. In what ways are your biomedical research staff involved in your STMSP? ***Circle all that apply.***

Recruitment of trainees	1
Selection of trainees	2
Mentoring	3
Research training	4
Teaching courses	5
Planning program activities	6
Specifying the resources needed for the program	**7**
Other—Circle "8" and specify activity below	8

A8. In the table below, circle the number that indicates how satisfied you are with the types a' institutional support provided to the STMSP.

How satisfied are you with the level of institutional support in the areas listed below?	Very Satisfied	Somewhat Satisfied	Somewnat Dissatisfied	Very1 Dissatisfec
Research faculty/staff assigned to the STMSP	4	3	2	1
Amount of research faculty/staff release time	4	3	2	1
Laboratories/equipment available to the STMSP	4	3	2	1
Resources available for recruiting trainees	4	3	2	1

A9. How is the STMSP linked to other research initiatives that target minority groups at the institution?

Circle all that apply.

There is little or no linkage with other initiatives 1
Shared laboratory space 2
Shared equipment and materials 3
Shared research staff 4
Joint research activities (e.g., seminars, field trips) 5
Joint social activities 6
Other—Circle *"7" and* ***spec~fv activity below*** ***7***

_____

B. TRAINEE RECRUITMENT. The next questions are about your procedures for recruiting trainees.

Bi. What methods do you use to recruit applicants for your STMSP' ***Circle all that apply.***

Presentations at research symposia/science fairs
Visits to targeted schools
Announcements in newsletters/scientific journals
Referrals from research faculty/staff
Referrals from other trainees
Referrals from other institutions
GRE locator seirvice
Brochures/flyers
Other—Circle "9" and specify below

_____

B2. In the table below, circle the number that indicates the effectiveness of each recruitment method.

Types of Recruitment Activity	Very Effective	Somewhat Effective	Somewhat Ineffective	Very ineffective	Not Appiicabie
Presentations at research symposia/science_fairs	4	3	2	1	0
Visits to targeted schools	4	3	2	1	0
Announcements in newsletters/scientific journals	4	3	2	1	0
Referrals from research faculty/staff	4	3	2	1	0
Referrals from other trainees	4	3	2	1	0
Referrals from other institutions	4	3	2	1	0
GRE locator service	4	3	2	1	0
Brochures/flyers	4	3	2	1	0
Other—Spec~/jP:	4	3	2	1	0

B3. How often does your STMSP actively recruit applicants for the program?

Ongoing process **.1**
Periodically during the year .2
Annually .3
Other—Circle "4" and spec~jv below .4

_____

B4. In which geographic areas do you recruit trainees? ***Circle all that apply.***

Recruit from within institution/facility	.1
Recruit locally (within a 50-mile radius of institution/facility)	.2
Recruit from throughout the State	.3
Recruit regionally (multi-State area)	.4
Recruit nationally	.5

85. Which group(s) are targeted by your recruitment methods? ***Circle all that apply.***

American Indians or Alaskan Natives	1
Asians/Pacific Islanders	2
Blacks, not of Hispanic origins	3
Hispanics	4
Whites, not of Hispanic origins	5
Others—Circle "6" ***and specify below***	6

_____

86. Does your STMSP work with Historically Black Colleges and Universities (HBCUs) or other institutions that serve a predominantly minority population to identify and recruit applicants?

Yes	1
No	2

B7. Please circle the number of the statement below that best describes your assessment of the applicants to your program.

We receive applications from more qualified applicants than we can accept	1
We receive just enough applications from qualified applicants to fill our slots	2
We do not receive enough applications from qualified applicants to fill all slots	3

B8. Do you sometimes accept applicants who do not meet all your criteria so that all slots can be filled?

Yes	1
No	2

89. Have there been any changes in the way you recruit applicants for your STMSP since the program began?

Yes	1
No—Circle "2" and skip to question BJO	2

B9a. What changes have you made in your recruitment procedures?

_____

_____

810. In the table below, circle the number that indicates how satisfied you are with various aspects of the trainee recruitment process.

How satisfied are you with the aspects of the trainee recruitment process listed below?	very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
The number of applicants	4	3	2	1
The qualifications of applicants	4	3	2	1
The geographic area in which you recruit	4	3	2	1
The overall procedure for recruiting applicants	4	3	2	1

811. If you indicated areas in question Bi 0, above, in which you are dissatisfied, what changes would you recommend?

_____

_____

_____

_____

C. TRAINEE SELECTION. The next questions are about how trainees are selected from the applicant pool.

C1. Who is involved in selecting trainees from the pool of applicants? ***Circle all that apply.***

STMSP program director	1
STMSP research faculty/staff	2
Institution administrators	3
Other STMSP trainees	4
Staff at other cooperating institutions	5
Other—Circle "6" and specify below	6

_____

_____

C2. Please rate the importance of the following criteria in selecting trainees for your STMSP. ***Circle the appropriate number next to each criterion, using 6 as the most important criterion, 5 as the next most important, and so on. You may use the same number for criteria of equal importance.***

Selection Criteria	Most					Least
Applicants demonstrated interest (academic major, extracurricular acttvities. association memberships)	6	5	4	3	2	1
Applicant's expressed interest (from application or interviews)	6	5	4	3	2	1
Recommendations from research faculty/staff or other professionals	6	5	4	3	2	1
Grade point average	6	5	4	3	2	1
SAT scores	6	5	4	3	2	1
Other—Spec~fv:	6	5	4	3	2	1

C3. Is a minimum grade point average (GPA) required to be accepted in your STMSP?

Yes—Circle "1" and enter minimum GPA below	1
No—Circle "2" and skip to question C4	2

Enter minimum GPA:_____

04. Have there been any changes in the criteria you use to select trainees for your STMSP since the program began?

Yes	1
No—Circle "2" and skip to question CS	2

C4a. What changes have you made in your selection criteria?

C5. In the table below, circle the number that indicates how satisfied you are with the various aspects of the trainee selection process.

How satisfied are you with the aspects of the trainee selection process listed below?	very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very1 Dissatisfied
The criteria used for selection	4	3	2	1
The information available to assess applicants	4	3	2	1
The applicants who are selected	4	3	2	1
The overall procedure for selecting trainees	4	3	2	1

C6. If you indicated areas in question C5, above, in which you are dissatisfied, what changes would you recommend?

C7. Please describe any unique recruiting or selection procedures you have used that you would recommend to other STMSPs.

C8. Do your recruitment and selection criteria identify the type of students you want to participate in the program?

Yes—Circle "1" and skip to question D1 1

No 2

C8a. If not, please explain.

D. **RESEARCH ASSIGNMENTS AND ACTIVITIES.** The next questions are about the researcn assignments and enrichment activities your institution provides to STMSP trainees.

Dl. How many research projects are available to trainees during an STMSP session?

Enter number of research projects: _____

D2. What type of research projects are available to STMSP trainees? ***Circle onli' one response.***

Both clinical and basic research	1
Clinical research only	2
Basic research only	3

D3. What area(s) of research assignments are available to STMSP trainees? ***Circle all that apply.***

Cardiovascular	1
Pulmonary	2
Hematologic	3
Other—Circle "4" ***and spec~fj' below***	4

_____

D4. How are trainees assigned to STMSP research training projects?

Trainee selects assignment	1
STMSP staff assign trainee	2
Joint decision between trainee and STMSP staff	3
Other—Circle "4" and ~pec!fvbelow	4

_____

D5. How many research faculty/staff are typically assigned to work with trainees on the research projects?

Enter number 0/research faculty/staff _____

D6. Is each trainee assigned one specific researcher—a mentor—who has primary responsibility for providing personal guidance and advice about education and career goals?

Yes	1
No	2

D7. How many senior and junior research faculty/staff would the trainee typically work with during the course of one session? ***Senior research facultv/siaff are those individuals having*** *JO or more* ***years of research experience. Junior research faculty/staff are those individuals wit/i less i/ian it/pears of research experience.***

Enter number of senior researchers: _____

Enter number ofiunior researchers:

D8. Have there been any changes in either the process for assigning trainees to research projects or the type of projects available for your STMSP since the program began?

Yes	1
No—Circle "2" and skip to question D9	2

D8a. What changes have been made in the type of research project(s) or the process of assigning trainees?

_____

_____

D9. What kinds of enrichment activi1~ies are available to trainees in your STMSP? ***Circle all that apply.***

Research forums, seminars, guest lecturers	1
Special courses	2
Student presentations	3
Workshops	4
GRE preparation and/cir graduate school counseling	5
Individual tutoring	6
Social activities and events	7
Other—Circle "8" and specify below	8

_____

Dl 0. For those activities that you consider to be most effective in meeting your STMSP goals, what do these activities offer that make them so effective?

_____

_____

_____

_____

E. TRAINEE EVALUATION AND FOLLOWUR The next questions are about how trainees are evaluated and followup procedLires you use to keep track of former trainees.

El. Is trainee progress evaluated during their participation in the STMSP?

Yes	1
No-Circle "2" and skip to question E2	2

Ela. At what point during STMSP participation are trainees evaluated? ***Circle onli one.***

Midway through the STMSP session	1
At the end of the STMSP session	2
Ongoing feedback	3
Other—Circle "4" and specify below	4

_____

El b. Who is involved in the evaluation process? ***Circle all that apply.***

Mentor	1
STMSP Program Director	2
Other STMSP research faculty/staff	3
Other—Circle "4" and specifi' below	4

_____

El c. In the table below, please circle the number indicating the methods of assessment used an~ the areas assessed for each level of trainee included in your STMSP program.

Methods of Assessment	Under-graduates	Graduates	Health1 Professionals
Assessment by research faculty/staff	1	1	1
Grades given by research faculty/staff	2	2	2
Performance on standardized tests	3	3	3
Other—Spec~fv:	4	4	4
Areas Assessed			
Proficiency in research methods	5	5	5
Knowledge in area of expertise	6	6	6
Poster presentations/seminars on STMSP research project	7	7	7
Written reports on findings from STMSP research project	8	8	8
Publication resulting from STMSP research experience	9	9	9
Other—Spec~fv:	10	10	10

Eld. In what ways are evaluation results used? ***Circle all that apply.***

Identify areas in which trainee needs additional tutoring or support 1

Identify trainee's strengths to encourage trainee to pursue a research career 2

Provide basis for recommending trainees for grants, fellowships, graduate school, etc 3

Assess whether program is targeting students with appropriate background and skills 4

Identify areas needed to improve STMSP 5

Assess effectiveness of research training 6

Assess effectiveness of enrichment activities 7

Other—Circle "8" and spec~fv below 8

El e. In what ways are the evaluation results shared with trainees? *Circle all iliat app/v.*

Results are shared in writing 1

Results are shared verbally 2

Results are shared both verbally and in writing 3

Results are not shared with trainees 4

E2. After students have completed their training session(s), is any followup conducted?

Yes 1

No—Circle "2" and skip to question E3 2

E2a. Which of the following followup activities do you conduct with former trainees and how often are these activities conducted? ***Please check each activity that i'ou do and number of times peryear it is conducted.***

Followup Activities		
Activity	**Check Here**	**Number of Times per Year**
Send questionnaire requesting information on current status (e.g.. in school, employment)		
Mentor contacts trainee by phone to obtain update on status: review progress		
Mentor meets with trainee to obtain update on status: review_progress		
Hold "reunions" of former trainees (primarily social_activities)		
Invite trainees to workshops. seminars		

E2b Please check below the kinds of information you obtain from former trainees

Check	Information Obtained From Former Trainees
	Current status (in school/employed/unemployed)
	Trainee's address and telephone number
	If in school:
	Major
	Grade point average
	Intention to continue education
	Intended major in graduate school
	If graduating. preferred employment
	Participation in programs similar to STMSP
	If employed
	Employer
	Type of work
	If research, area of research
	Income
	Satisfaction with job
	Intention to remain in job/similar job
	Assessment of usefulness of STMSP experience
	Relevancy to' school
	Relevancy to employment
	Suggestions for changes to STMSP

E2c. How many former trainees are you still in touch with?

Enter number of undergraduate trainees:

Enter number of graduate trainees:

Enter number of health professional student trainees:

E2d. How many years do you plan to follow your former trainees?

Enter number of years following undergraduate trainees:

Enter number of ;'ears following graduate trainees:

Enter number of years following health professional student trainees:

E3. Does your institution offer any nonfinancial support to former trainees, such as networking, letters of recommendation, invitations to research symposia, periodic contacts with mentors, and the like?

Yes	1
No—Circle ~F2Ln and skip to question F)	2

E3a. Please list below the activities your institution undertakes to support former trainees.

1. _____

2. _____

3. _____

4. _____

5. _____

F. OPINIONS AND RECOMMENDATIONS

F1. In the table below, circle the number that indicates your opinion of how successful your STMSP rias been in the following areas.

How successful has your STMSP been in the areas listed below?	Very Successful	Fairly Successful	Fairly Unsuccessful	Very Unsuccessful
Enhancing trainees' research skills	4	3	2	1
Increasing trainees' knowledge of the range of positions in biomedical careers	4	3	2	1
Increasing trainees' knowledge of typical research duties and responsibilities	4	3	2	1
Increasing trainees understanding of education/training required for career	4	3	2	1
Increasing trainees' understanding of the rewards of biomedical research careers	4	3	2	1
Developing trainees' sense of belonging to the scientific community	4	3	2	1

F2. What factors—either characteristics of your institution or procedures your institution followed—do you feel contributed to the achievement of your STMSP trainees?

F3 In your opinion, what were the biggest problems your institution faced in implementing the STMSP?

F4. Please enter any other comments or recommendations about the STMSP that help to describe how it operated or that would help others in planning and conducting an STMSP

G. **PROGRAM DIRECTOR BACKGROUND.** These last few questions are about you and your role in tne STMSP.

Gi. When did you become director of the STMSP at this institution? ***Enter** year:* ____

G2. On average, about how many hours do you spend each week on STMSP-related activities?

Hours spent during the STMSP training session? ***Enter hours per week:*** ____

Hours spent for the rest of the year? ***Enter hours per week:*** ____

G3. Other than your responsibilities with the STMSP, what is your role at this institution?

Primarily teaching
Primarily research
Primarily administrative
About half research and half administrative **4**
Other—Circle "5" and specify below

_____

G4. Which of the following best describes you? ***Circle one.***

American Indian or Alaskan Native
Asian/Pacific Islander
Black, not of Hispanic origin
Hispanic **.4**
White, not of Hispanic origin
Other—Circle "6" and specific below

G5. Are you male or female?

Male 1
Female 2

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT STUDY.

ID#

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

RESEARCH FACULTY/STAFF QUESTIONNAIRE

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

RESEARCH FACULTY/STAFF QUESTIONNAIRE

A. STRUCTURE OF THE STMSP

A1. In which years did you participate in the STMSP program?

Circle all applicable years: 1992 1993 **1994** 1995 1996

A2. In what ways have you been involved in the STMSP? *Circle* ***all that apply.***

Recruitment of trainees

Selection of trainees

Mentoring

Research training

Teaching courses

Planning program activities

Specifying the resources needed for the program ...

Other—Circle *"8" and specify activit' below*

_____

_____

B. TRAINEE RECRUITMENT. The next questions are about your procedures for recruiting trainees.

Bi. Do you participate in any recruitment activities?

Yes	1
No—Circle "2" and skip to question Cl	2

B2. In which of the following recruitment activities have you participated? ***Circle all*** *that apply.*

Presentations at research symposia/science fairs	
Visits to targeted schools	**2**
Preparing announcements in newsletters/scientific journals	**3**
Reviewing applications to evaluate applicant qualifications	4
Interviewing applicants	
Serving on committees that assess applicants	**6**
Other—Circle "7" ***and specify activity below***	**7**

_____

B3. In the table below, circle the number that indicates your opinion of the effectiveness of each recruitment method used by your institution.

Types of Recruitment Activity	Very Effective	Somewhat Effective	Somewhat Ineffective	Very Ineffective	Not Applicable
Presentations at research symposia/science fairs	4	3	2	1	0
Visits to targeted schools	4	3	2	1	0
Announcements in newsletters/scientific journals	4	3	2	1	0
Research faculty/staff referrals	4	3	2	1	0
Referrals from other trainees	4	3	2	1	0
Referrals from other institutions	4	3	2	1	0
GRE locator service	4	3	2	1	0
Brochures/flyers	4	3	2	1	0
Other—Spec~fj':	4	3	2	1	0

B4. Do your recruiting methods target any of the following groups? ***Circle all that app/v.***

American Indians or Alaskan Natives	1
Asians/Pacific Islanders	2
Blacks, not of Hispanic origins	3
Hispanics	4
Whites, not of Hispanic origins	5
Others—Circle "6" and specifi' below	***6***

_____

B5. Please circle the number of the statement below that best describes your assessment of the applicants to your program.

We receive applications from more qualified applicants than we can accept	1
We receive just enough applications from qualified applicants to fill our slots	2
We do not receive enough applications from qualified applicants to fill all slots	3

B6. Have there been any changes in the way you recruit applicants for your STMSP since the program began?

Yes	1
No-Circle "2" and skip to question B 7	2

B6a. What changes have you made in recruitment procedures?

_____

_____

B7. In the table below, circle the number that indicates how satisfied you are with various aspects of the trainee recruitment process.

How satisfied are you with the aspects of the trainee recruitment process listed below?	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	very Dissatisfied
The number of applicants	4	3	2	1
The qualifications of applicants	4	3	2	1
The geographic area in which you recruit	4	3	2	1
The overall procedure for recruiting applicants	4	3	2	1

B8. If you indicated areas in question B7, above, in which you are dissatisfied, what changes would you recommend?

C. TRAINEE SELECTION. The next questions are about how trainees are selected from the applicant pool.

C1. Are you involved in selecting trainees from the pool of applicants?

Yes	1
No—Circle "2" and skip to question D1	2

C2. What criteria do you believe are the most important in selecting trainees for the STMSP? ***Circle the appropriate number next to each criterion, using 6 as the most important criterion,*** 5 as ***the next most important, and so on. You may use the same number for criteria of equal importance.***

Selection Criteria	Most					Least
Applicant's demonstrated interest (academic major, extracurricular activities. association memberships)	6	5	4	3	2	1
Applicants expressed interest (from application or interviews)	6	5	4	3	2	1
Recommendations from research faculty/staff or other professionals	6	5	4	3	2	1
Grade point average	6	5	4	3	2	1
SAT scores	6	5	4	3	2	1
Not applicable	6	5	4	3	2	1
Other—Specifi:	6	5	4	3	2	1

C3 Are applicants who do not meet all your criteria sometimes accepted so that all slots can be filled?

Yes	1
No	2

C4. In the table below, circle the number that indicates how satisfied you are with the various aspects of the trainee selection process.

How satisfied are you with the aspects of the trainee selection process listed below	very Satisfied	Fairly Satisfied	Fairly Dissatisfied	Very Dissatisfied
The criteria used for selection	4	3	2	1
The information available to assess trainees	4	3	2	1
The qualifications of the trainees selected	4	3	2	1
The overall procedure for selecting trainees	4	3	2	1

05. If you indicated areas in question 04, above, in which you are dissatisfied, what cnanges wouta you recommend?

06. Please describe any unique recruiting or selection procedures you have used that you would recommend to other STMSPs.

D. RESEARCH ASSIGNMENTS. The next questions are about the research assignments ano enrichment activities your institution provides to STMSP trainees

DI Are the projects that you work on with STMSP trainees clinical or basic research? ***Circle*** *on/v one* ***response.***

Both clinical and basic research	1
Clinical research only	2
Basic research only	3

02. What area(s) of research projects do you work with STMSP trainees? ***Circle all that*** *app/v.*

Cardiovascular	1
Pulmonary	2
Hematologic	3
Other—Circle ***"4" and specify below***	***4***

_____

03. What are the biggest challenges in working with trainees? ***Circle all that apply.***

Enhancing trainees research skills	1
Instilling an understanding of a research career	2
Creating/maintaining trainees' interest in research careers	3
Getting trainees to participate in enrichment activities	4
Helping trainees develop a sense of belonging to the research community	
Other—Circle ***"6" and spec~fj' below***	6

_____

_____

04. About how many hours per week do you spend on STMSP activities—working directly with trainees, planning activities, attending special seminars and other events, and any other STMSP activity?

Enter hours per week during the STMSP training session:_____

Enter hours per week for the rest of the year: _____

D5. Have you served as a mentor—someone who had primary responsibility for providing personal guidance and advice about education and career goals—to one or more trainees?

Yes	1
No—Circle "2" and skip to question D6	2

D5a. During any given STMSP training period, how many trainees do you typically mentor?

Number of trainees for which you serve as mentor: _____

D5b. Briefly describe activities you undertook with your trainees (outside of the laboratory experience, such as career counseling) that were particularly successful in meeting the goals of the STMSP.

_____

_____

_____

D6. What kinds of enrichment activities are available to trainees in your STMSP? ***Circle all that apply.***

Research forums, seminars, guest lecturers	1
Special courses	2
Student presentations	3
Workshops	4
GRE preparation and/or graduate school counseling	5
Individual tutoring	6
Social activities and events	7
Don't ***know—Circle "8" and skip to question E1***	8
Other—Circle ***"9" and specify below***	***9***

_____

_____

D7. In your opinion, how effective are the enrichment activities your institution provides in meeting me STMSP goals? ***For each activity offered by your STMSP, circle the number dial indicates its effectiveness.***

How effective are the enrichment activities listed below~	very Effective	Somewhat Effective	Somewtiat ineffective	very1 ineffective
Research forums, seminars, guest lecturers	4	3	2	1
Special courses	4	3	2	1
Student presentations	4	3	2	1
Workshops	4	3	2	1
GRE preparation/graduate school counseling	4	3	2	1
Individual mentoring	4	3	2	1
Social activities and events	4	3	2	1
Other—Spec~fv:	**4**	**3**	**2**	1

D8. For those activities that you consider to be very effective, what do these activities offer that make them very effective?

E. TRAINEE FOLLOWUP AND EVALUATION. The next questions are about how trainees are evaluated and followup procedures that you use to keep track of former trainees.

EI. Have you been involved in evaluating trainee's progress during their participation in the STMSP~

Yes	i
No—Circle "2" and skip to question E2	2

Ela. At what point during STMSP participation are trainees evaluated? ***Circle only one.***

Midway through the STMSP session	
At the end of the STMSP session	2
Ongoing feedback	3
Other—Circle "4" and spec~fj' below	***4***

_____

EI b. Who is involved in the evaluation process? ***Circle all that apply.***

Mentor	
STMSP Program Director	2
Other STMSP research faculty/staff	3
Other—Circle "4" and specify below	***4***

_____

E1c. In the table below, please circle the number indicating the methods of assessment used and the areas assessed for each level of trainee included in your STMSP program.

Methods of Assessment	Under-graduates	Graduates	Health Professionais
Assessment by research faculty/staff	1	1	1
Grades given by research faculty/staff	2	2	2
Performance on standardized tests	3	3	3
Other—Specifr:	4	4	4
Areas Assessed			
Proficiency in research methods	5	5	5
Knowledge in area of expertise	6	6	6
Poster presentations/seminars on STMSP research project	7	7	7
Written reports on findings from STMSP research project	8	8	8
Publication resulting from STMSP research experience	9	9	9
Other—Specify:	10	10	10

E1d. In what ways are evaluation results used? ***Circle all that apply.***

Identify areas in which trainee needs additional tutoring or support.. . . 1

Identify trainee's strengths to encourage trainee to pursue a research career . . . 2

Provide basis for recommending trainees for grants, fellowships, graduate school, etc. 3

Assess whether program is targeting students with appropriate background and skills 4

Identify areas needed to improve STMSP 5

Assess'effectiveness of research training 6

Assess effectiveness of enrichment activities 7

Other—Circle "8" and spec!fv below 8

_____

Ele In what ways are the evaluation results shared **with** train~~5~ ***Circle all that apply***

Results are shared in writing 1

Results are shared verbally 2

Results are shared both verbally and in writing 3

Results are not shared with trainees ... 4

E2. After trainees have completed their STMSP session(s), are you involved in any followup activities of former trainees?

Yes 1

No—Circle "2" and skip to question E3 2

E2a. Which of the following followup activities do you conduct with former trainees and how often are these activities conducted? ***Please check each activity that you do and number of times per year it is conducted.***

Activity	Check Here	Number of Times per Year
Send questionnaire requesting information on current status (e.g., in school, employment)		
Mentor contacts trainee by phone to obtain update on status and review progress		
Mentor meets with trainee to obtain update on status and review progress		
Hold "reunions' of former trainees (primarily_social_activities)		
Invite trainees to workshops, seminars		
Other—Spec~fr:		

E2b Please check below the kinds of information you obtain from former trainees

Check	Information Obtained From Former Trainees
	Current status (in school/employed/unemployed)
	Trainee's address and telephone number
	If in school
	Major
	Grade point average
	Intention to continue education
	Intended major in graduate school
	If graduating. preferred employment
	Participation in programs similar to STMSP
	If employed.
	Employer
	Type of work
	If research, area of research
	Income
	Satisfaction with job
	Intention to remain in job/similar job
	Assessment of usefulness of STMSP experience
	Relevance to school
	Relevance to employment
	Suggestions for changes to STMSP

E3. Do you maintain any contacts with former trainees?

Yes 1

No—Circle "2" and skip to question F1 2

E3a In which of the following ways do you maintain contacV ***Circle all that appli.***

Networking	~1
Letters of recommendation	2
Invitations to research symposia	3
Periodic contacts with mentors	4
Continued work on research paper/publications	5
Other—Circle "6" and specify below	6

F. OPINIONS AND RECOMMENDATIONS

F1. In the table below, circle the number that indicates your opinion of how successful your STMSP has been in the following areas:

How successful has your STMSP been in the areas listed below?	Very Successful	Somewhat Successful	Somewhat Unsuccessful	Very Unsuccessful
Enhancing trainees' research skills	4	3	2	1
Increasing trainees' knowledge of the range of positions in biomedical careers	4	3	2	1
Increasing trainees' knowledge of typical research duties and responsibilities	4	3	2	1
Increasing trainees' understanding of education/training required for career	4	3	2	1
Increasing trainees' understanding of the rewards of biomedical research careers	4	3	2	1
Developing trainees' sense of belonging to the scientific community	4	3	2	1

F2. What factors—either characteristics of your institution or procedures your institution followed—do you feel have contributed to the achievement of the STMSP trainees?

_____

_____

F3. In your opinion, what were the biggest problems your institution faced in implementing the STMSP?

_____

_____

_____

F4. Please enter any other comments or recommendations about the STMSP that help to describe how it operated or that would help others in planning and conducting an STMSP

_____

_____

_____

_____

G. RESEARCH FACULTY/STAFF BACKGROUND

Gi. Which of the following best describes you? ***Circle one.***

American Indian or Alaskan Native	1
Asian/Pacific Islander	2
Black, not of Hispanic origin	3
Hispanic	4
White, not of Hispanic origin	5
Other—Circle "6" and spec~fv below	6

_____

G2. Are you male or female?

Male	1
Female	2

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT STUDY.

ID#

SHORT-TERM TRAINING FOR MINORITY

STUDENTS PROGRAM (STMSP)

TRAINEE QUESTIONNAIRE

_____ _____

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)
TRAINEE QUESTIONNAIRE

A. STMSP RESEARCH EXPERIENCE

A1. Which of the following best describes your status at the time you last participated in the STMSP~'

Undergraduate student

Graduate student 2

Enrolled in a health professional school 3

Other ***Circle "4" and spec~fv below*** ***4***

A2. Was your home institution a historically Black college or university?

Yes

No 2

A3 What was your grade point average (GPA) when you entered the STMSP? ***If not sure, enter best estimate. If on pass/fall system, circle NA.***

Enter GPA: _____

Highest Possible GPA:

NA

A4 What was your major field of study when you **first applied** to the STMSP? ***(Select the name and code number of the major field from the Academic Major and Employment Specialty List on page 17. Please write in your major, ~fiot listed. If you have a double major, enter and code both majors.)***

Enter major: _____ ***Code:*** _____

Enter second major: _____ ***Code:*** _____

A5. How did you learn about the STMSP9 ***Circle all that apply.***

Announcement posted at home institution 1

Attendance at professional conference or seminar **2**

Professor at home institution 3

Recruiter visited home institution ***4***

From another student 5

Other—Circle "6" and spedfy below ***6***

A6. What was your career status/interest(s) when you first learned of the 5TMSR~ ***Circle all that apply.***

Pursuing a degree in the biomedical sciences	1
Considering a career in the biomedical sciences	2
Considering a research-oriented program or career	3
Giving little or no thought to a research career	
Other—Circle "5" and spe~fy below	5

_____

_____

A7 Why did you apply to the STMSP? ***Circle all that apply.***

For the research/training experience	
To find out if research was really what I wanted to do	.2
To find out if research in the area of heart, lung, and blood disease was of interest to me	**.3**
Encouraged to apply by faculty, family, or some other person	**.4**
Had prior experience in heart, lung, and blood disease research and wanted to continue research in that area	
Other—Circle "6" and specafi' below	**.6**

_____

_____

A8. How many times have you participated in the STMSP?

Once	
Twice	2
More than twice	3

A9. When did you last participate in the STMSP? From: _____ To: _____***I***
Month/Year Month/Year

AlO. Where did your most recent STMSP research experience take place[9] ***Circle only one.***

At the institution I attend (home institution)	1
At an institution other than my home institution	2
At a hospital or clinic affiliated with my home institution	3
At a hospital or clinic not associated with my home institution	4
At a research laboratory not affiliated with an academic institution	5
Other type of research facility—Circle ***"6" andspecify below***	6

_____

A11 Before participating in the STMSP, what research experience(s) did you have[9]

Circle all that apph.

Participated in research activities during high school	1
Hands-on experience with laboratory equipment	2
Participated in research activities at my home institution during the academic year and/or summer months	3
Participated in research activities at other institutions during the academic year and/or summer months	4
Attended scientific conferences	5
Presented original research	6
No research experience	7

A12. Before participating in the STMSP, had you participated in any other science-related training programs targeted to minority students?

Yes	1
No—Circle "2" ***and skip to question A14***	2

A13. Did you participate in any of the research traineeships listed in the table below? ***If yes, please enter information requested in the table.***

Please circle "1" opposite each program in which you participated; circle "2" if you did not participate. For each program in which you participated, enter the year(s) you participated and the institution at which the program was conducted.

Program	Participated? YES	Participated? NO	Year(s) Participated	Institution/ Site of Training
Minority Access to Research Careers (MARC)	1	2		
Minority Biomedical Research Support (MBRS)	1	2		
Research Improvement in Minority Institutions (RIMI)	1	2		
American Indian Research Opportunities (AIRO)	1	2		
Bridges to the Future Program	1	2		
Minority High School Student Research Apprenticeship Program (MHSSRAP)	1	2		
Research Supplements for Underrepresented Minorities	1	2		
Other—Spec~h':	1	2		
Other—Specifi:	1	2		

A14. In which of the following program areas was your STMSP research experience? ***Circle only onc.***

Cardiovascular (heart and vascular) diseases—Circle ***"I" and skip to question A 15*** 1

Pulmonary (lung) diseases—Circle "2" ***and skip to question A)6*** 2

Hematologic (blood diseases and blood resources management)—Circle ***"3" and skip to question A17*** 3

More than one of the above areas 4

Some other ***area—Circle "5" and specify below*** 5

AIS. In which of the following areas was your cardiovascular research experience? ***Circle only one.***

Arteriosclerosis 1
Hypertension 2
Cerebrovascular disease 3
Coronary heart disease 4
Peripheral vascular diseases 5
Arrhythmias 6
Heart failure and shock 7
Congenital and rheumatic heart diseases 8
Cardiomyopathies and infections of the heart 9
Circulatory assistance 10
Acquired Immunodeficiency Syndrome 11
Otherircle ***"12" and spec~/j' below*** 12

GO TOQUESTIONAI8

A16. In which of the following areas was your pulmonary research experience? ***Circle only one.***

Structure and function of the respiratory system 1
Chronic obstructive pulmonary diseases 2
Pediatric pulmonary diseases 3
Occupational and immunologic lung diseases 4
Respiratory failure 5
Pulmonary vascular diseases 6
Acquired Immunodeficiency Syndrome 7

Otherircle *"8" and specifj below* 8

_____

GO TO QUESTIO/% A)8

A17. In which of the following areas was your hematologic research experience?
Circle only one.

Bleeding and cloning disorders	1
Disorders of the red blood cell	2
Sickle Cell Disease	3
Blood resources	***4***
Acquired Immunodeficiency Syndrome	5
Other-Circle "6" and specifi' below	6

_____

A18. To what extent were you involved in choosing your STMSP research project?

Very involved	1
Somewhat involved	2
Not very involved	3
Not involved at all	4

A19. Which of the following statements best describe your level of satisfaction with your STMSP research project assignment?

I was very satisfied with my STMSP research project	1
I was somewhat satisfied with my STMSP research project	2
I was somewhat dissatisfied with my STMSP research project	3
I was very dissatisfied with my STMSP research project	4

A20. What changes, if any, would you suggest for the STMSP research project assignment process?

_____

_____

A21. To what extent was your role in conducting the STMSP research monitored?

Great extent	1
Some extent	2
Very little	3
Notatall	4

A22 Who was responsible for monitoring your STMSP research project assignmenf~

STMSP Program Director

Assigned mentor 2

Director of the research project. 3

Some other person—Circle ***"4" and spec~jjv below*** ***4***

_____

My research assignment was not monitored at all 5

A23 What changes, if any, would you suggest to improve the monitoring and support you received as a STMSP trainee[9]

_____

_____

A24 What methods were used to provide you with feedback on the progress of your assigned research project9

Method of Providing Feedback	**Frequency_of_Receiving_Feedback**			
	Oft	**Sometimes**	**Seldom**	**[Never**
Verbal. informal conversation	3	2	1	0
Verbal. formal scheduled meetings	3	2	1	0
Written, informal notes	3	2	1	0
Written formal exchange	3	2	1	0
Other—specp'v:	3	2	1	0
Other—specifi':	3	2	1	0

A25. Please circle the number that indicates how satisfied you were with the following aspects of feedback you received regarding your STMSP research experience.

Type of Feedback	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Amount of feedback you received	4	3	2	1
Level of support you received in carrying out your research	4	3	2	1
Frequency of contact with research faculty/staff	4	3	2	1

A26 For how many months was your most recent STMSP research experience[9]

Less than 2 months

2 months.... 2

3

3 months

More than 3 months.. 4

A27. About how many hours per week did you spend conducting research activities during your most recent STMSP experience?

Less than 20 hours per week 1

20 to 29 hours per week 2

30to40 hours perweek 3

More than 40 hours per week **4**

A28 In the boxes below, please indicate the number of times per week you had direct contact with staff at your STMSP institution, i.e., you talked with them one on one.

	0 Times	**[1-2 Times**	**3-4 Times**	**More than 4 Times**
Your Mentor	1	2	3	4
STMSP Program Director	1	2	3	4
Other STMSP research faculty/staff	1	2	3	4
Other faculty/staff at the institution who were not involved with the STMSP	1	2	3	4

A28a. Were any of your contacts related to any of the activities listed below?

	Yes	**No**
Discussing the range of research positions available9	1	2
Pursuing an area of specialization?	1	2
Pursuing multiple career paths?	1	2
Training and education required for biomedical careers9	1	2
The types of satisfaction, recognition, and compensation derived from a research career?	1	2

A29 How satisfied were you with the following aspects of your STMSP experience? ***Circle the appropriate response. Then use the boxes to rank order the importance of aspects circled where 1 is the most important aspect of the program.***

	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	NA	Rank
Research training	4	3	2	1	0	
Research assignment process	4	3	2	1	0	
Research facility/equipment	4	3	2	1	0	
Mentoring relationships	4	3	2	1	0	
Exposure to research career opportunities	4	3	2	1	0	
Guidance and counseling	4	3	2	1	0	
Stipend amount	4	3	2	1	0	
Enrichment activities (e g., seminars, courses, and social activities)	4	3	2	1	0	
Opportunities for publication	4	3	2	1	0	
Other—Specify ***below***	***4***	3	2	1	0	

A30. Were any of the following special activities available to you as an STMSP trainee? ***Circle the number next to each activity that was available. Then use the boxes to rank order the importance of the circled activities to ~'ou, where 1 is the most important aspect of the program, ~ is next most important, and so on.***

		Rank
Research forums, seminars, guest lecturers	1	
Special courses	2	
Student presentations	3	
Workshops	4	
GRE preparation or graduate school counseling	5	
Individual tutoring	6	
Social activities and events	7	
Other—Circle "8" and specify below	8	

A31. In which of the following areas of the STMSP would you suggest that crianges be maoe[9]

Recruitment and selection process—Circle ***")"and specify below***

Level of mentor involvement—Circle "2" ***and specify below*** 2

Research experience—Circle ***"3" and specify below*** 3

Opportunities for publication—Circle ***"4" and specify below*** 4

Stipend amount—Circle ***"5" and specify below*** 5

Activities designed to help you feel a part of the research institution—Circle "6" ***and specify below*** ***6***

Other-Circle "7" ***and specify below*** ***7***

A32. Did your participation in the STMSP training have any direct impact on your decision in any of tne following areas[9]

	Yes	No
Career choice	1	2
Area of specialization	1	2
Employment choices	1	2
Graduate training	1	2

A33. During the academic year, did you have an opportunity to continue your research activity following the STMSP research experience?

Yes

No—Circle "2" ***and skip to question RI*** 2

A34 Describe what you did to continue the research activity begun during the STMSP

_____

_____

B. EDUCATIONAL EXPERIENCE

Bi What is the highest level of education you have completed? ***Circle only one.***

Freshman	
Sophomore..	2
Junior	3
Senior	4
Bachelors degree	5
Masters degree	6
PhD	7
MD	8
Postdoctoral studies	9
Other—Circle "10" and spec.~fy below	10

B2. Which of the following best describes your current status? ***Circle only one.***

Full-time undergraduate student	1
Part-time undergraduate student	2
Full-time graduate student	3
Part-time graduate student	4
Health professional student	6
Enrolled in classes, not seeking a ***degree—Circle*** "7" ***and skip to question B8***	***7***
Not currently enrolled in ***school—Circle "8" and skip to question B8***	8
Other—Circle "9" and spedfv below	9

B3. What kind of degree are you currently seeking? ***Circle only one.***

2-year Associate's Degree	1
Bachelor's Degree	2
Master's Degree	3
Professionaldoctorate(MDODDDS DVM)	4
Combined M.D/Ph D	5
Other professional degree (e g, L.L.B. and J.D.)	6
Otherircle "7" ***and spec~fv below***	7

B4. ***What :svour current major field of study? Use codes from the Academic Major and Emploirnent Spcciultv List on page 17,0 select the name and number of the major field. Please write in i'our mujor. if not listed. If you have a double major. enter and code both majors.***

Enter major: _____ ***Codc:*** _____

Enter second ma or: _____ ***Codc:*** _____

B5 When do you expect to receive your degre&' ***Enter month and year.***

_____ / _____
Month Year

B6 How far have you advanced toward your degre&' ***Circle onli~ one.***

Completed some coursework	1
Completed all coursework only	2
Completed qualifying exams	3
Thesis/dissertation proposal approved	4
Data collection in progress/completed	5
Thesis/dissertation writing in progress	6
Other—Circle "7" ***and specify below***	7

_____

B7. Did you change your major after completing the STMSP?

Yes	1
No—Circle "2" ***and skip to question B8***	2

B7a. If you changed your major, why?

_____

_____

B8. In which of the following areas are your career interests? ***Circle all that apply.***

Basic research	1
Clinical research	2
Medicine (nonresearch)	3
Other sciences	4
Undecided	
Other—Circle "6" and specify below	6

_____

B9. Have you received any honors or awards while enrolled in either undergraduate or graduate ~

Yes

No—Circle "2' ***and ski,, to question CI*** 2

B9a Please list each honor and award (e.g., Dean's List, fellowships, and scholarships) you flave received and the year in which you received it.

Honor or Award	**Year**

C. EMPLOYMENT

C1 What is your employment status, including fellowships')

Employed full time (35 hours or more per week) 1

Employed part time (less than 35 hours per week) 2

Unemployed—Circle ***"3" and skip to question C4*** ... 3

02. From the Academic Major and Employment Specialty List on page 17 of this questionnaire, enter both the name and number of the specialty most closely related to your current principal employment Please write in your specialty even if it is not on the list.

Enter specialty name: _____ ***Code:*** _____

03. Is this work related to biomedical research?

Yes—Circle "1" and skip to question CS 1

No 2

04 Have you ever been employed in the biomedical research field?

Yes 1

No—Circle **"2" and** ***skip to question DI*** 2

C4a. If you previously worked in the biomedical research field, which of the following reasons best describes why you left?

To return to school 1

For a better paying job 2

No longer interested in the biomedical research field 3

Some other reason 4

GO TO QUESTIOPV DI

05 What are your job duties?

_____

_____

_____

06. How long have you worked in this field? ***Enter months and years:*** _____ / _____ Months/Years

How long have you worked in this job? ***Enter months and years:*** _____ / _____ Months/Years

07 What is your current annual salary?

Under $10000	
$10,000 to $19,999	2
$20,000 to $29,999	3
$30,000 to $39,999	4
$40,000 to $49,999	5
$50,000 to $74,999	**.6**
$75,000 or More	7

08 Please circle the number opposite the statement that best describes the extent to which the work you are doing is related to research training you received in the STMSP.

The work I am doing is ciirectly related to my STMSP research training	1
The work I am doing is somewhat related to my STMSP research training	2
The work I am doing is not related at all to my STMSP research training	3

09 Please circle the number in the table below that indicates how important each of the following factors were in influencing your decision to pursue your current career choice.

Career Choice Influences	Very important	Somewhat important	Not Very important	Not At Au important
High school or other precollege studies	4	3	2	1
College studies	4	3	2	1
Work experience	**4**	**3**	**2**	1
Hobby or special interest	**4**	**3**	**2**	**1**
STMSP research experience	4	3	2	1
Humanitarian reasons	4	3	2	1
Money	**4**	**3**	**2**	**1**
Prestige	4	3	2	1
Opinions of family or friends	4	3	2	1
Opinions of teachers	4	3	2	1

D: BACKGROUND INFORMATION

DI What is your date of birth? ***Enter month and veur:*** _____

D2 Are you male or femal~'~ ***Circle one:*** Male 1 Female 2

D3. Are you a U.S. citizen?

Yes 1
No 2

D4. Which of the following best describes you? ***Circle one response.***

American Indian or Alaskan Native 1
Asian 2
Pacific Islander 3
Black (African American)4
White S

D5. Which of the following ethnic categories best describes you? ***Circle one.***

Hispanic 1
non-Hispanic 2

D6 Further research may be conducted by the STMSP. To be certain that we can contact you later, please provide the name and address of someone who would know how to locate you, but does ***not*** live in your household.

Name_____ Relationship_____

Address_____ Telephone Number_____

City_____ State_____ Zin

D7. Do you plan to move to another city within the next year?

Yes-Circle "I- and specify city/state below 1

_____

No 2

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT STUDY.

ACADEMIC MAJOR AND EMPLOYMENT SPECIALTY LIST

Agriculture

013 Agronomy
014 Animal, dairy, poultry sciences
015 Farm and range management
016 Fish, game. and wildlife management
017 Food sciences
018 Forestry and related sciences
019 Horticulture
020 Natural resources management
021 Soil science
090 Agricultural sciences, other

Bioiogicai Sciences

211 Anatomy, histology
213 Biochemistry
214 Biophysics
215 Botany
221 cell and molecular biology
216 Entomology
226 Embryology
217 Genetics
218 immunology
219 Marine biology
220 Microbiology, bacteriology
227 Neurosciences
222 Nutrition
228 Parasitology
223 Pathology, human, animal, plant
224 Physiology, human, animal, plant
229 Radiobiology
230 Toxicology
225 Zoology
290 Biological sciences, other

Education

413 Biological sciences education
414 Engineering education
417 Mathematics education
421 Physical sciences education
425 Social science education
490 Education, other

Engineering

511 Aerospace, aeronautical, astronautical
512 Agricultural
513 Architectural
514 Bioengineering and biomedical engineering
515 chemical
516 Civil, construction, and transportation
518 Computer engineering
517 Electrical, electronic, and communication
529 Engineering science
519 Environmental and sanitary
520 Geological
521 Industrial
530 Materials
522 Mechanicai
523 Metailurgical
524 Mining and mineral
525 Naval architecture and marine engineering
526 Nuclear
531 Ocean
527 Petroleum
590 Engineering, other

751 Operations research/management sciences

Mathematical Sciences

711 Actuarial science
723 Computer and information sciences
750 Mathematics
751 Operations research/management sciences
713 Statistics
780 Mathematical sciences, other

Physical **Sciences**

720 Astronomy
721 Atmospheric sciences and meteorology
213 Biochemistry
722 Chemistry
741 Earth sciences and geology
733 Metallurgy
742 Oceanography
731 Physics
790 Physical sciences, other

Social Sciences

811 Anthropology
812 Criminology
813 Economics
814 Geography
823 Linguistics
817 Political science and government
818 Psychology (except clinical)
821 Sociology
822 urban studies
890 Social sciences, other

Health Sciences

611 Clinical psychology
612 Dentistry
614 Hospital and health care administration
615 Medicine or premedicine
616 Nursing
617 Pharmacology
618 Pharmacy
690 Health sciences, other

Arts and Humanities

109 Area and ethnic studies
110 Arts and letters, general
115 English and lournalism
114 Fine and applied arts
116 Foreign language and literature, all fields
117 History
119 Philosophy
120 Religion and theology

Other Specialties

911 Architecture and environmental design
914 Business and commerce
912 Home economics, all fields
913 Law and prelaw
915 Military science, including merchant marine deck officer
916 Social work
999 Other fields
(SPECIFY_____

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

ABBREVIATED TRAINEE QUESTIONNAIRE

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)
ABBREVIATED TRAINEE QUESTIONNAIRE

A. STMSP RESEARCH EXPERIENCE

A1. Which of these categories best describes your status at the time you last participated in the STMSP?

Undergraduate student	1
Graduate student	2
Enrolled in a health professional school	3
Other—Please specify'	***4***

_____

A2. Was your home institution a historically Black college or university?

Yes	1
No	2

A3 What was your grade point average (GPA) when you entered the STMSP? *1ff* ***not sure, enter best estimate. if on pass/fail system, circle NA./***

Enter GPA: _____

NA

A3a. What was the highest possible GPA you could have received?

Highest Possible GPA: _____

A4. What was your major field of study when you first applied to the STMSP? ***JNOTE: KRA staff will enter codes.J***

Enter major: _____ ***Code:***

Enter second major: _____ ***Code:***

A5. Before participating in the STMSP, what research experience did you have? Did you *iCircle all that applvi*

Participate in research activities during high school'~	1
Have hands-on experience with laboratory equipment7	2
Participate in research activities at my home institution during the academic year and/or summer months'~	3
Participate in research activities at other institutions during the academic year and/or summer months7	4
Had you attended scientific conferences7	5
Had you presented original research7	6
No research experience *hf no to all abovel*	7

A6. Before participating in the STMSP, had you participated in any other science-related training programs targeted to minority students?

Yes	
No—Skip to question A8	2

A7. Did you participate in any of the following research traineeships?

Please circle or enter the appropriate response. Read each program and ask for year and institution.

Program	Participated? YES	NO	Year(s) Participated	Institution! Site of Training
Minority Access to Research Careers (MARC)	1	2		
Minority Biomedical Research Support (MBRS)	1	2		
Research Improvement in Minority Institutions_(RIMI)	1	2		
American Indian Research Opportunities (AIRO)	1	2		
Bridges to the Future Program	1	2		
Minority High School Student Research Apprenticeship Program (MHSSRAP)	1	2		
Research Supplements for Underrepresented Minorities	1	2		

A7a. Did you participate in any other research traineeships? If so, what were they[7]

Please circle or enter the appropriate response. Ask for year and institution.				
Program	**Participated?**		**Year(s) Participated**	**Institution! Site of Training**
	YES	**NO**		
Other—Specqi:	1	2		
Other—Spec~/V:	1	2		

A8. In which of these program areas was your STMSP research experience?
ICircle ***only onel***

Cardiovascular (heart and vascular) diseases	1
Pulmonary (lung) diseases	2
Hematologic (blood diseases and blood resources management	**3**
More than one of the above areas	**4**
Some other ***area—Please spec~/j'***	**5**

A9 For each of the categories I'm going to read, please tell me if you were very satisfied, somewhat satisfied, somewhat dissatisfied or very dissatisfied with your STMSP experience

	very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	NA
Research training	**4**	**3**	**2**	1	**0**
Research assignment process	**4**	**3**	**2**	1	0
Research facility/equipment	**4**	**3**	**2**	1	0
Mentoring relationships	**4**	**3**	**2**	1	0
Exposure to research career opportunities	**4**	**3**	**2**	1	0
Guidance and counseling	**4**	**3**	2	1	0
Stipend amount	**4**	**3**	2	1	0
Enrichment activities (e.g., seminars, courses, and social activities)	***4***	**3**	2	1	0
Opportunities for publication	***4***	**3**	2	1	0

AlO. Did your participation in the STMSP training have any direct impact on your decision regaroing

	Yes	No
Career choice	1	2
Area of specialization	1	2
Employment choices	1	2
Graduate training	1	2

B. EDUCATIONAL EXPERIENCE

Bi. What is the highest level of education you have completed? ***ICircie only one.J***

High School/GED	1
Freshman	2
Sophomore	3
Junior	4
Senior	5
Bachelor's degree	6
Master's degree	7
PhD	8
M.D	9
Postdoctoral studies	10
Other—Please specify	11

B2. Which of the following best describes your current status? ***ICircle onlp one.J***

Full-time undergraduate student	1
Part-time undergraduate student	2
Full-time graduate student	3
Part-time graduate student	4
Health professional student ...	6
Enrolled in classes, not seeking a ***degree—Skip to question B5***	7
Not currently enrolled in school—Skip ***to question B5***	8
Other—Please specify	9

B3. What kind of degree are you currently seeking? ***ICircle onli one.!***

2-year Associate's Degree	.1
Bachelor's Degree	2
Master's Degree	.3
Professional doctorate(MD, OD, DDS, DVM)	.4
Combined M.D/Ph D	
Other professional degree (e g, L L B and J D)	6
Other—Please specify	7

_____

B4. What is your current major field(s) of study? ***INOTE: KRA staff will enter codes.J***

Enter major: _____ ***Code:*** _____

Enter second major: _____ ***Code:*** _____

B5. In which of the following areas are your career interests? ***ICircie all that apply.!***

Basic research	1
Clinical research	2
Medicine (nonresearch)	3
Other sciences	4
Undecided	5
Other—Please spec~fV	6

_____

C. EMPLOYMENT

CI. What is your employment status, including fellowships? ***Please do not include information regarding current STMSP participation.***

Employed full time (35 hours or more per week)	1
Employed part time (less than 35 hours per week)	2
Unemployed	3

D: BACKGROUND INFORMATION

DI. What is your date of birth 7 ***Enter mont/i atid year:*** _____

D2 Are you male or female7 ***(Circle one:/*** Male 1 Female 2

D3. Which of the following best describes you? ***(Circle one response.!***

American Indian or Alaskan Native	1
Asian/Pacific Islander	2
Black, not of Hispanic origin	3
Hispanic	4
White, not of Hispanic origin	5
Other—Please specify	6

_____

D4. Lastly, we are interested in why trainees may have not responded to the survey earlier Could you tell me why you previously did not complete and return your questionnaire? ***(Circle all that applyl***

Never received the questionnaire	1
Did not have the time	2
Lost/misplaced the questionnaire	3
Was not familiar with the STMSP/didn't think it applied to me	***4***
Not interested; couldn't be bothered	5
Other—Please specijjv	6

_____

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT STUDY.

ACADEMIC MAJOR AND EMPLOYMENT SPECIALTY LIST

Agriculture

013 Agronomy
014 Animal, dairy, poultry sciences
015 Farm and range management
016 Fish, game, and wildlife management
017 Food sciences
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019 Horticulture
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021 Soil science
090 Agricultural sciences, other

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211 Anatomy. histology
213 Biochemistry
214 Biophysics
215 Botany
221 cell and molecular biology
216 Entomology
226 Embryology
217 Genetics
218 Immunology
219 Marine biology
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227 Neurosciences
222 Nutrition
228 Parasitology
223 Pathology, human, animal, plant
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413 Biological sciences education
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425 Social science education
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514 Bioengineering and biomedical engineering
515 chemical
516 Civil, construction, and transportation
518 computer engineering
517 Electrical, electronic, and communication
529 Engineering science
519 Environmental and sanitary
520 Geological
521 industrial
530 Materials
522 Mechanical
523 Metallurgical
524 Mining and mineral
525 Naval architecture and marine engineering
526 Nuclear
531 Ocean
527 Petroleum
590 Engineering, other

751 Operations research/management sciences

Mathematical Sciences

711 Actuarial science
723 computer and information sciences
750 Mathematics
751 Operations research/management sciences
713 Statistics
780 Mathematical sciences, Other

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720 Astronomy
721 Atmospheric sciences and meteorology
213 Biochemistry
722 chemistry
741 Earth sciences and geology
733 Metallurgy
742 Oceanography
731 Physics
790 Physical sciences, other

Social Sciences

811 Anthropology
812 criminology
813 Economics
814 Geography
823 Linguistics
817 Political science and government
818 Psychology (except clinical)
821 Sociology
822 urban studies
890 Social sciences, other

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614 Hospital and health care administration
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110 Arts and letters, general
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114 Fine and applied arts
116 Foreign language and literature, all fields
117 History
119 Philosophy
120 Religion and theology

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911 Architecture and environmental design
914 Business and commerce
912 Home economics, all fields
913 Law and prelaw
915 Military science, including merchant marine deck officer
916 Social work
999 Other fields
(SPECIFY_____

SHORT-TERM TRAINING FOR MINORITY

STUDENTS PROGRAM (STMSP)

APPLICANT QUESTIONNAIRE

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)
APPLICANT QUESTIONNAIRE

A. PRE-APPLICATION STATUS

AI. Which of the following best describes your status at the time you applied to the STMSP"

Undergraduate student	1
Graduate student	**2**
Enrolled in a health professional school	**3**
Other—Circle "4" and specify below	***4***

_____

A2. Was your home institution a historically Black college or university?

Yes	1
No	2

A3. What was your grade point average (GPA) when you applied to the STMSP~ ***If no! sure, enter best estimate. If on pass/fail system, circle NA.***

Enter GPA: _____

Highest Possible GPA: _____

NA

A4 What was your major field of study when you **applied to the STMSP~~** ***(Select the name (md code number of the major field from the Academic Major and Employment Specialty List on page 11. Please write in your major, ~f not listed. If you have a double major, enter and code both majors.)***

Enter major: _____ ***Code:***

Enter second major: _____ ***Code:***

A5. How did you learn about the STMSP? ***C7rcle all that apply***

Announcement posted at home institution	1
Attendance at professional conference or seminar	**2**
Professor at home institution ..	**3**
Recruiter visited home institution	**4**
From another student	**5**
Other—Circle "6" and specify below	**6**

_____

A6 What was ~‘ourcareer status/interest(s) when you applied to the STMSP7

Circle all that apply.

Pursuing a degree in the biomedical sciences	1
Considering a career in the biomedical sciences	2
Considering a research-oriented program or career	3
Giving little or no thought to a research career	4
Other—C7rcle ***“5” and specify below***	5

_____

_____

A7. Why did you apply to the STMSP? ***Circle all that apply.***

For the research/training experience	1
To find out if research was really what I wanted to do	2
To find out if research in the area of heart, lung, and blood disease was of interest to me	3
Encouraged to apply by faculty, family, or some other person	4
Had prior experience in heart, lung, and blood disease research and wanted to ccintinue research in that area	5
Other—Circle “6” and specify below	6

_____

_____

B. RESEARCH EXPERIENCE

Bi Before applying to the STMSP, what research experience(s) did you hav&~ *(‘ircle all that apply.*

Participated in research activities during high school	1
Hands-on experience with labc,ratory equipment	2
Participated in research activities at my home institution during the academic year and/or summer months	3
Participated in research activities at other institutions during the academic year and/or summer months	4
Attended scientific conferences	5
Presented original research	6
No research experience	7

B2 Before applying to the STMSP, had yciu participated in any other science-related training programs targeted to minority students?

Yes	1
No—C~ircle “2” ***and skip to question B4***	2

B3. Did you participate in any of the research traineeships listed in the table below? ***If yes, please enter information requested in the table.***

Please circle “1” opposite each program in which you participated; circle “2” if you did not participate. For each program in which you participated, enter the year(s) ***you participated and the institution at which the program was conducted.***

Program	Participated YES	Participated NO	Year(s) Participated	Institution/ Site of Training
Minority Access to Research Careers (MARC)	1	2		
Minority Biomedical Research Support (MBRS)	1	2		
Research Improvement in Minority Institutions (RIMI)	1	2		
American Indian Research Opportunities (AIRO)	1	2		
Bridges to the Future Program	1	2		
Minority High School Student Research Apprenticeship Program (MHSSRAP)	1	2		
Research Supplements for Underrepresented Minorities	1	2		

Other—Spec~/ji':	1	2
Other—SpeclfP:	1	2

B4 Did your research experience have any direct impact on your decision in any of the following areas[9]

	Yes	**No**
Career choice	1	2
Area of specialization	1	2
Employment choices	1	2
Graduate training	1	2

C. EDUCATIONAL EXPERIENCE

C1 What is the highest level of education you have completed? ***Circle only one.***

High School/GED	1
Freshman	2
Sophomore	3
Junior	4
Senior	5
Bachelor's degree	6
Master's degree	7
PhD	8
M.D	9
Postdoctoral studies	10
Other—C7rcle ***"JI" and spec~f4' below***	11

C2. Which of the following best describes your current status? ***Circle only one.***

Full-time undergraduate. student	1
Part-time undergraduate student	2
Full-time graduate student	3
Part-time graduate student	4
Health professional student	6
Enrolled in classes, not seeking a degree—Circle "7" ***and skip to question*** *C7*	7
Not currently enrolled in school—Circle ***"8" and skip to question*** *C7*	8
Other—C'ircle "9" and *specify below*	***9***

C3 What kind of degree are you currently seeking? ***Circle only one.***

2-year Associate's Degree	1
Bachelors Degree	2
Masters Degree	**3**
Professional doctorate (MD, OD, DDS, DVM)	4
Combined M.D/Ph.D	5
Other professional degree (e g L.L B and J D ***)—Circle "6" and specify below***	6

Other—Circle "7" ***and spec~fV below*** 7

_____

C4. What is your current major field of study? ***Use codes from the Academic Major and Employment Specialty List on page 11 to select the name and number of the majorfield. Please write in your major, !fnot listed. Ifyou have a double major, enter and code both majors.***

Enter major: _____ ***Code:*** _____

Enter second major: _____ ***Code:***

CS. When do you expect to receive your degree? ***Enter month and year.***

_____ / _____
Month Year

C6. How far have you advanced toward your degree? ***Circle only one.***

Completed some coursework	1
Completed all coursework only	2
Completed qualifying exams	3
Thesis/dissertation proposal approved	4
Data collection in progress/completed	5
Thesis/dissertation writing in progress	6
Other—Circle "7" ***and specify below***	7

_____

C7. In which of the following areas are your career interests? ***('ircle all that apply.***

Basic research	1
Clinical research	2
Medicine (nonresearch)	3
Other sciences	4
Undecided	5
Other—Circle "6" and spec~[j' below	6

_____

C8. Have you received any honors or awards while enrolled in either undergraduate or graduate school?

Yes	1
No—Circle "2" and skip to question DI	2

C8a. Please list each honor and award (e.g., Deans List, fellowships, and scholarships) you have received and the year in which you received it.

Honor or Award	**Year**

D. EMPLOYMENT

DI What is your employment status, including fellowships?

Employed full time (35 hours or more per week)	1
Employed part time (less than 35 hours per week)	2
Unemployed—Circle ***"3" and skip to question D4***	3

D2. From the Academic Major and Employment Specialty List on page 11 of this questionnaire, enter both the name and number of the specialty most closely related to your current principal employment. ***Please write in your specialty even if it is not on the list.***

Enter specialty name: _____ ***Code:***

D3. Is this work related to biomedical research?

Yes—Circle "1" and skip to question DS	1
No	2

D4 Have you ever been employed in the biomedical research field?

Yes	1
No—Circle "2" and skip to question EI	2

D4a If you previously worked in the biomedical research field, which of the following reasons best describes why you left?

To return to school	1
For a better paying job	2
No longer interested in the biomedical research field	3
Some other reason	4

GO TO QUESTION EI

D5. What are your job duties?

_____

_____

_____

D6 How long have you worked in this field? ***Enter months andyears:*** _____ Montfls!Years

How long have you worked in this job? ***Enter mont/is and years:*** _____ Months/Years

D7. What is your current annual salary?

Under $10,000	1
$10,OOOtoSl9,999	2
$20,000 to $29,99g	3
$30,000 to $39,999	4
$40,000 to $49,999	5
$50,000 to $74,999	6
$75,000 or More	7

D8 Please circle the number in the table below that indicates how important each of the following factors were in influencing your decision to pursue your current career choice.

Career Choice Influences	Very important	Somewhat important	Not Very important	Not At All important
High school or other precollege studies	4	3	2	1
College studies	4	3	2	1
Work experience	**4**	**3**	**2**	**1**
Hobby or special interest	4	3	2	1
Previous research experience	4	3	2	1
Humanitarian reasons	4	3	2	1
Money	4	3	2	1
Prestige	4	3	2	1
Opinions of family or friends	4	3	2	1
Opinions of teachers	4	3	2	1

BACKGROUND INFORMATION

EI What is your date of b~rth~ ***Enter month and year:*** /

E2. Are you male or female? ***Circle one:*** Male 1 Female 2

E3. Are you a U.S. citizen?

Yes 1

No 2

E4. Which of the following best describes you? ***Circle one response.***

American Indian or Alaskan Native 1

Asian/Pacific Islander 2

Black, not of Hispanic origin 3

Hispanic 4

White, not of Hispanic origin 5

Other—Circle "6" and specify below 6

_____

ES Further research may be conducted by the STMSP. To be certain that we can contact you later, please provide the name and address of someone who would know how to locate you, but does ***not*** live in your household.

Name_____ Relationship _____

Address _____ Telephone Number _____

City_____ State Zip

E6. Do you plan to move to another city within the next year?

Yes—Circle "1" and specify city/state below 1

_____

No **2**

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT STUDY.

ID# ____

ACADEMIC MAJOR AND EMPLOYMENT SPECIALTY LIST

Agriculture

013 Agronomy
014 Animal, dairy, poultry scienceS
015 Farm and range management
016 Fish, game, and wildlife management
017 Food sciences
018 Forestry and related sciences
019 Horticulture
020 Natural resources management
021 Soil science
090 Agricultural sciences, other

Biological Sciences

211 Anatomy, histology
213 Biochemistry
214 Biophysics
215 Botany
221 Cell and molecular biology
216 Entomology
226 Embryology
217 Genetics
218 Immunology
219 Marine biology
220 Microbiology, bacteriology
227 Neurosciences
222 Nutrition
228 Parasltology
223 Pathology, human, animal, plant
224 Physiology, human, animal, plant
229 Radiobiology
230 Toxicology
225 Zoology
290 Biological sciences, other

Education

413 Biological sciences education
414 Engineering education
417 Mathematics education
421 Physical sciences education
425 Social science education
490 Education, other

Engineering

511 Aerospace, aeronautical, astronautical
512 Agricultural
513 Architectural
514 Bioengineering and biomedical engineering
515 Chemical
516 Civil, construction, and transportation
518 Computer engineering
517 Electrical, electronic, and communication
529 Engineering science
519 Environmental and sanitary
520 Geological
521 Industrial
530 Materials
522 Mechanical
523 Metallurgical
524 Mining and mineral
525 Naval architecture and marine engineering
526 Nuclear
531 Ocean
527 Petroleum
590 Engineering, other

751 Operations research/management sciences

Mathematical Sciences

711 Actuarial science
723 Computer and information sciences
750 Mathematics
751 Operations research/management sciences
713 Statistics
780 Mathematical sciences, other

PhysIcal Sciences

720 Astronomy
721 Atmospheric sciences and meteorology
213 Biochemistry
722 Chemistry
741 Earth sciences and geology
733 Metallurgy
742 Oceanography
731 Physics
790 Physical sciences, other

Social Sciences

811 Anthropology
812 Criminology
813 Economics
814 Geography
823 Linguistics
817 Political science and govemment
818 Psychology (except clinical)
821 Sociology
822 Urban studies
890 Social sciences, other

Health Sciences

611 Clinical psychology
612 Dentistry
614 Hospital and health care administration
615 Medicine or premedicine
616 Nursing
617 Pharmacology
618 Pharmacy
690 Health sciences, other

Arts and Humanities

109 Area and ethnic studies
110 Arts and letters, general
115 English and joumalism
114 Fine and applied arts
116 Foreign language and literature, all fields
117 History
119 Philosophy
120 Religion and theology

Other Specialties

911 Architecture and environmental design
914 Business and commerce
912 Home economics, all fields
913 Law and prelaw
915 Military science, including merchant marine deck officer
916 Social work
999 Other fields
(SPECIFY_____

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

APPLICANT AND TRAINEE CHARACTERISTICS DATA COLLECTION FORM

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)
APPLICANT AND TRAINEE CHARACTERISTICS

Please provide the number of applicants or trainees requested in the tables below. When completed, please return this form in the attached stamped, self-addressed envelope.

In Table 1 below, enter the number of STMSP applications you received for each applicable year

Table 1. Enter the number of applications received from the groups listed below	1992	1993	1994	1995	1996
American Indians or Alaskan Natives					
Asians/Pacific Islanders					
Blacks, not of Hispanic origins					
Hispanics					
Whites, not of Hispanic origins					
Other minorities					
Females					
Males					
Total number of applications received					

In Table 2 below, enter the number of trainees in your program for the applicable years 1992 through 1996.

Table 2. Enter the number of trainees by applicable year for each of the categories listed below:'	1992	1993	1994	1995	1996
Participation of Trainees					
Trainees slots allocated					
Trainee slots filled (i.e., number of trainees)					
Trainees who did not complete training					
Trainees who completed two summer experiences (enter under first year of participation)					
Level of trainees in program					
Undergraduate students					
Graduate students					
Health professional students					

Table 2. Enter the number of trainees by applicable year for each of the categories listed below.	1992	1993	1994	1995	1996
Trainees' institution:					
Trainees from your own institution					
Trainees from other institutions					
Minority group membership of trainees:					
American Indians or Alaskan Natives					
Asians/Pacific Islanders					
Blacks, not of Hispanic origins					
Hispanics					
Other minorities					
Gender of Trainees:					
Female					
Male					

In Table 3 below, enter the number of trainees who have entered graduate or medical school.

Table 3. Enter, by year of STMSP participation. the number of trainees who have entered graduate or medical school:	Year of STMSP Participation				
	1992	1993	[1994	11995	1996
Trainees who entered this institution's graduate school					
Trainees who entered this institution's medical school					
Trainees who entered another institution's graduate school					
Trainees who entered another institution's medical school					

THANK YOU FOR PROVIDING THIS INFORMATION.

CASE STUDY TOPIC GUIDES

SHORT-TERM TRAINING FOR MINORITY STUDENTS PROGRAM (STMSP)

PROGRAM DIRECTOR TOPIC GUIDE

STMSP PROGRAM DIRECTOR TOPIC GUIDE

Introduction: Hello, my name is _____ I am with KRA Corporation, a research fir-rn located in Silver Spring. Maryland. We have been contracted by the National Heart. Lung, and Blood to conductan evaluation ofthe Short-Term Training for Minority Students Program. As you are aware. the evaluation includesa survey ofSTMSP directors, research faculrvistaff, trainees, and applicants. It also includes visits to selected STMSP institutions to learn more about STMSP operations firsthand. During the next few days. I will be talkin2 with you and members ofyour staff about how your STMSP operates. your recruitmentand selection processes. and the kinds ofresearch assignments and enrichment activities available to trainees. I will also like to meet and interview a few of your STMSP trainees to learn more about their education and research experiences. Each of the interviews, including those with trainees, will take approximately 60 minutes to complete.

Before we begin your interview. I need to inform you that your participation is voluntary and there are no penalties if you choose not to participate to the interview as a whole or to any particular question. The information you provide will be kept confidential and will not be disclosed in identifiable form to any but the researchers conducting the study or as required by law. The information may be used in related research where collaborating researchers and contractors may be allowed to access the researchrecords to accomplish objectives consistent with the basic research purpose. However, your privacy and confidentiality will be protected.

Do you have any questions?

STMSP Program Director Topic Guide

Involvement With the STMSP

A1. What are your primarv responsibilities with the STMSP (e.g.. program administration, research training, teaching)? What is your academic/staff position with this institution?

A2. When did you become involved with the STMSP? Were you involved in designing the STMSP at this institution? If so. in what ways (e.g.. writing the initial grant proposal. developing the design of program components. helping to obtain institutional support)?

A3. What percentage of your time is spent on STMSP-related activities?

A4. Are you granted release time for your involvement with the STMSP?

Institutional Linkages

B 1. Where does the STMSP fit within the organizational structure of this institution (e.g.. Chemistrv Department. Special Programs)?

B2. When did this institution initially receive the STMSP grant? **(Probe to determine how many years the institution has received STMSP grants.)**

B3. How do higher level administrators of this institution view the STMSP (e.c.. departmental chairs, division chiefs)? In what ways. if any, is the STNISP supported by the institution (e.g.. assists in grant writing, provides supplemental funding)?

B4. Does this institution operate any other minority science-related initiatives (e.g.. Minority Access to Research Careers [MARC). Minority Biomedical Research Support [MBRS])? If so. is the STMSP linked to these programs (e.g.. shared lab space. shared equipment/material)?

B5. Does the STMSP compete with other programs or initiatives for resources or administrative priority? **(Probe to determine whether institution provides STMSP with needed resources.)**

Structure of the STMSP

Cl. What level(s) of trainees does the STMSP serve?

C2. How many training slotsdoes the STMSP have? Have the number of slots changed since the STMSP began?

C3. How many research faculty/staff are assigned to the STMSP? **(Probe to determine whether the number of staff has changed since the STMSP began.)**

C4. In what ways are research faculty/staff involved with the STMSP? **(Probe to determine whether there are different roles for senior and junior staff.)**

Applicant Recruitment

Dl. What methods are used to recruit applicants for the STMSP? Of the methods used, which are most effective?

D2. What is the geographic scope of recruitment for your STMSP? Are applicants recruited from within the institution as well as from outside institutions?

D3. Is recruitment an ongoing process. or does your STMSP only recruit applicants during certain times of the ~ear?

D4. Are efforts made to recruit those students who have previously participated in the STMSP?

D5. Does your STMSP target any specific groups of applicants (e.g.. science majors. honor students. African Americans. Hispanics)? If so. what special efforts. if any. does the STMSP take to identify them?

D6. Does your STMSP have linkages with other institutions to identifx' and recruit prospective applicants? If so. please describe. **(Probe to determine whether linkages are formal, whether there are linkages with either historically Black colleges and universities (HBCUs) or other predominately minority institutions.)**

D7. Does your STMSP have difficulty recruiting qualified applicants? Have there been instances when you were not able to fill all of the STMSP slots? If so. please explain.

D8. Have there been any changes in the process/procedures used to recruit STMSP applicants? If so. please explain.

Trainee Selection

El. What is the process used for selecting trainees for your STMSP? **(Probe to determine whether applicants are required to submit formal applications, whether applicants are interviewed.)**

E2. Who is involved in the selection process? **(Probe to determine whether selection is made by research faculty/staff, by the STMSP program director, or by committee. If by committee, who are the committee members?)**

E3. What are the criteria used in selecting trainees for your STMSP (e.g.. applicant interest, staff recommendations. GPA)?

E4. Which criterion is most influential in determining which trainees are selected?

E5. If you have more fully qualified applicants for the traineeships than slots available, what do you do?

E6. Have trainees who were selected for the STMSP ever decided not to accept the traineeships? If so, what reasons were given for not accepting the traineeships?

E7. Have you experienced any difficulty in retaining trainees who were selected? If so. please explain.

E8. Have there been any changes in the procedures for selectine STMSP trainees?

STMSP Research Experiences and Activities

Fl. How many STMSP-related research projects does this institution have? (Probe to **determine the number and type of projects, e.g., 8 heart-related, clinical research, basic research, etc.)**

F2. When are the research training experiences (e.g.. May through August. June through September)? What is the average length of the assignments? **(Probe to determine the number of weeks, whether assignments are full time during the summer months, and whether part-time assignments are available). Can** trainees continue their research during the academic year?

F3. How are trainees assigned to research projects? Are trainees given a choice in the projects thex' are assigned to? Are efforts made to match trainees to projects based on their interest or experience? Can a trainee request reassignment to another project?

F4. Are trainees assigned to one primary research faculty/staff person? ls the staff person who supervises the research project also the trainees' mentor? **(Probe to determine whether research faculty/staff and mentors are the same or separate staffs.)**

FS. What kinds of responsibilities are trainees given on research projects? Does the level of responsibility depend on the experience of the trainee? Is more than one trainee assigned to a project? Are new trainees paired with those who have previously participated in the STMSP?

F6. Have there been any changes in the assignment process or type of research project available?

F7. What types of enrichment activities are available to STMSP trainees? **(Probe to determine availability and providers.)**

F8. Do you feel the enrichment activities help trainees develop needed skills? If so. how?

F9. Have there been any changes in the types of enrichment activities available?

A mentor is a staff person responsible for providing the trainee with personal guidance and advice about **education** and career goals.

FlO. What is the process for evaluating trainee performance in the ST\ISP? Who is involved in the process? When are evaluations conducted?

F II. What are the procedures for tracking trainees after they have completed their trainin2 cycle? Who is responsible for tracking trainees? How frequently is it done?

F12. What type of information is collected on former trainees? How and where is the information maintained?

Perceptions of the STMSP

Gi. How successful do you feel your STMSP has been in achieving the following goals:

- Increasing trainee knowledge of careers and opportunities in biomedical or behavioral research?
- Enhancing trainee research skills?
- Developing trainee sense of belonging to the scientific community?
- Encouraging trainees to pursue degrees related to biomedical or behavioral sciences?
- Stimulating trainee interest in pursuing careers in biomedical or behavioral research?

G2. What factors have facilitated the successful implementation of ~'ourSTMSP (e.g.. level of institutional support. commitment of STMSP staff)?

G3. What difficulties has your STMSP experienced (e.g.. lack of funding. inadequate facilities)?

Suggestions and Recommendations

HI. What improvements would you recommend? Specifically. how would you change the following aspects of the STMSP:

- Recruitment?
- Selection?
- Research assignment?

- Enrichment activities?
- Other?

SHORT-TERM TRAINING FOR MINORITY

STUDENTS PROGRAM (STMSP)

RESEARCH FACULTY/STAFF TOPIC GUIDE

STMSP PROGRAM RESEARCH FACULTYISTAFF TOPIC GUIDE

Introduction: Hello, my name is _____ I am with KRA Corporation. a research firm located in Silver Spring. Maryland. We have been contracted by the National Heart. Lung. and Blood to conduct an evaluation of the Short-Term Training for Minority Students Program. As you ma~ be aware. the evaluation includes a survey of STMSP directors. research faculty 'staff. trainees. and applicants. It also includes visits to selected STMSP institutions. The purpose of the visits is to talk with STMSP staff and trainees directly to learn more about STMSP operations and activities firsthand. I would like to conduct an interview with you to ask you about your involvement with the STMSP. your recruitment and selection processes. and the kinds of research assignments and enrichment activities available to trainees. The interview takes approximately 60 minutes to complete.

Please be advised that your participation in the interview is voluntary and there are no penalties if ~'ouchoose not to participate to the interview as a whole or to any particular question. The information you provide will be kept confidential and will not be disclosed in identifiable form to any but the researchers conducting the study or as required by law. The information may be used in related research where collaborating researchers and contractors may be allowed to access the research records to accomplish objectives consistent with the basic research purpose. However. ~'our privacy and confidentiality will be protected.

Before we begin, do you have any questions?

STMSP Research Faculty/Staff Topic Guide

Research FacultylStaff Background

A1. What is your academic/staff position with this institution?

A2. How long have you been with this institution.

A3. What is your highest academic degree (i.e.. degree and area of specialization)?

A4. What is your current area of substantive research?

Involvement With the STMSP

BI. What are your primary responsibilities with the STMSP (e.g.. research. teachin~Y?

B2. When did you become involved with the STMSP? Were you involved in desicnin~ the STMSP at this institution? If so. in what ways (e.g.. writing the initial grant proposal. developing the STMSP components. helping to obtain institutional support)?

B3. What percentage of your time is spent on STMSP-related activities?

B4. Are you granted release time for your involvement with the STMSP?

BS. Are you involved with any other programs similar to STMSP at this institution? If so. which programs and in what ways (e.g.. recruiting. research)?

Applicant Recruitment and Selection (If involved in this)

Cl. In what ways are you involved in recruiting STMSP applicants (e.g.. making presentations. interviewing applicants)?

C2. To what extent do you feel recruitment efforts have resulted in xour STMSP attracting the desired number and type of applicants?

C3. Are you also involved in selecting STMSP trainees? If so. what is your role in the selection process.

C4. In selecting trainees, what criteria are used? Of the criteria used. which is most influential in selecting trainees? Are trainees required to have a minimum GPA? If so. what is it?

C5. In selecting trainees, what happens if there are more fully qualified applicants than slots available? What factors are considered in making final selections?

STMSP Research Experience and Activities

Dl. What are the substantive areas of research for the STMSP projects you supervise (e.g.. cardiovascular, pulmonary. hematological. combination)?

D2. What is your involvement, if any. in assigning trainees to research projects?

D3. What factors are considered in the assignment process'? **(Probe to determine whether trainee has input, whether efforts are made to match trainee interest and experience)**

D4. How many STMSP trainees do you typically supervise'mentor? **(Probe to determine both the average number of trainees supervised on research projects and the average number of trainees mentored.)**

D5. How much time do you normally spend on STMSP-related activities? **(Probe for average hours per week per session.)**

D6. What kinds of responsibilities are STMSP trainees given on research projects (i.e.. ways in which trainees gain research experience)?

D7. How often do you meet with the trainees you mentor? What is the nature of the contacts you have with trainees (e.g.. monitor progress. evaluate performance. discuss problems and difficulties)?

D8. Are you involved in providing any of the STMSP enrichment activities (e.g.. seminars, lectures)? If so. please describe. **(Probe to determine whether information on career choices, graduate schools, and GRE preparation is provided.)**

D9. Are enrichment activities limited to STMSP trainees or can others (e.g.. faculty and other students) also participate in/attend them? is participationlattendancemanda~orv for STMSP trainees? Are trainees given any academic credit for their participation?

DIO. In what ways, if any. are trainees helped to develop a sense of belonging to the scientific community? **(Probe to determine whether there is contact outside of the laboratory or classroom and why.)**

DII. Do you have any contact with trainees after they have completed the STMSP? If so. how often and why?

Perceptions of the STMSP

El. How successful do you feel the STMSP has been in terms of the following:

- Increasing trainee knowledge of careers and opportunities in biomedical or behavioral research?
- Enhancing trainee research skills?
- Developing trainee sense of belonging to the scientific community?

- Encouraging trainees to pursue degrees related to biom~dical or behavioral sciences?

- Stimulating trainee interest in pursuine careers in biomedical or behavioral research?

E2. What factors would ou say have facilitated implementation of the STMSP (e.g.. level of institutional support. commitment of STMSP staff)?

E3. What barriers or difficulties has the STMSP experienced (e.g.. lack of funding. inadequate facilities)?

Suggestions and Recommendations

F). What improvementsto the STMSP would you recommend? Specifically. how would you change the following aspects of the STMSP:

- Recruitment?

- Selection?

- Research assignments?

- Enrichment activities?

- Other?

SHORT-TERM TRAINING FOR MINORITY

STUDENTS PROGRAM (STMSP)

FOCUS GROUP DISCUSSION GUIDE

STMSP FOCUS GROUP DISCUSSION GUIDE

Introduction

I am here from KRA Corporation to learn more about the Short-Term Trainine for Minority Students Program. The National Heart. Lung. and Blood Institute has contracted with KR.A to conduct a study ofthe STMSP program. Because it is very important to get ~'ouinput about the STMSP. your selection to participate in this focus group was based on the number of trainees at an institution. **(Moderator, please read the appropriate sentence)**

- ***Because your institution had 10 orfewer STMSP trainees, we selected all of pou to be part of thefocus group.***

- ***Because your institution hadmore than 10 STMSP trainees, we randomlp selected a group of10 trainees.***

I would like to talk with you about your experience with the STMSP. We are visitinC several other campuses to talk with STMSP program directors. faculty/research staff. and trainees about their experiences with the program. Our findings from these visits will assist the NHLBI in making improvements in the STMSP.

Purpose

We are going to spend an hour or so talking about your experiences as STMSP trainees. We are interested in learning about the research training you have received. your level of satisfaction with the training, and anx recommendations you may have for changes in the program.

Method

During our time together today. I will ask you a few questions about your experiences with the STMSP. Iam interested in hearing what each of you think, and! appreciate your willingnessto talk with us. You may have different ideas about and experiences with the STMSP. There are no right or wrong answers.

Ground Rules

Because we must talk about several things in a short period of time. I may need to interrupt you. Please do not be offended ifI do. I will only do so to be surethat everyone has a chance to talk and

that we cover all of the issues that are important to the group. Also, if you do not undcrstand ~i question. please let me know.

Your comments will be kept confidential and will not in any way affect your participation in th~ STMSP now or in the future. I will tape our conversation to help me write up our discussion and recommendations. All of the information gathered from the focus group discussions will be summarized and included as part of a report to the NHLBI. Your individual comments will not be shared with anyone else. Before we begin. I would also like to advised that your participation in the discussion is voluntary and there will be no penalties if you choose to not respond either to the discussion as a whole or to any particular question.

Introductions

Now. I would like you to introduce yourselves, starting with your first name. the school you attend, your x'ear in school, your major. and whether this is your first or second research experience.

Recruitment and Selection

How did you learn about the STMSP? How were you selected to participate in the program?

What happened during the selection process? in your opinion, how well did the process work?

PROBE: Do you remember how you first heard about the STMSP?

PROBE: Was there a formal application, or were you simply chosen? Was it a competitive process?

PROBE: Had you applied previously to participate in the STMSP? Were you selected?

PROBE: Do you think the selection process is fair or unfair?

PROBE: Did any of you have a different experience?

STMSP Research Experience

I am interested in your summer research experience. Tell us a little bit about the summer programs in which you are involved. Specifically, I am interested in the following questions:

PROBE: How are you assigned to a research project? Were you given a choice in your assignment?

PROBE: Are you assigned to one project or multiple projects? Can you be reassiened to another project after your initial assiunment?

PROBE: How long are your assignments?

PROBE: What kinds of responsibilities are you given? How challenging are your responsibilities?

PROBE: Can you continue your research during the academic ~'ear?

PROBE: How much of your time is spent in a lab, in lectures. and at presentations.

Previous Research Experience

Did you previously participate in research other than STMSP?

PROBE: Was yourprevious assignment at this institution or at another research center?

PROBE: Was your previous assignment in a different area of research?

PROBE: Did your previous experience stimulate interest in applying to STMSP?

PROBE: Are you interested in conducting biomedical research as a result of your experience?

PROBE: From your experience, do you feel you have gained a sense of belonging in the biomedical community?

Enrichment Activities

Do you participate in any enrichment activities such as seminars, lectures. workshops. or conferences?

Do you find these activities useful?

Mentorship

I am interested in learning whether you developed any student-mentor~ relationships during your research experience.

A mentor is a staff person responsible for providing the trainee with personal guidance and advice about education and career goals.

PROBE: Do you work closely with a faculty mentor? Is she/he readily availablL' and accessible?

PROBE: How often do you see your mentor? Daily. weekly, or by appointment?

PROBE: Are there advantages to working with a mentor? If you did not work with a mentor. do you think a mentor would have been helpful?

Evaluation

How is your progress monitored and evaluated?

PROBE: Are you given an opportunity to provide feedback to the STMSP staff about the program?

PROBE: Do you keep in touch with STMSP faculty/research staff or mentors at the institution where you were placed?

Future Plans

What are your plans for graduate studies or a career in biomedicine?

PROBE: Do you plan to attend graduate. medical. or other health professional school?

PROBE: In what area(s) of biomedicine would you like to continue your studies or do research?

PROBE: In what wax's. if any. has the STMSP played a role in x'our decision-making process?

PROBE: Have your plans changed since you participated in the STMSP? If so. how?

Satisfaction

Now, let's discuss your overall satisfaction with the STMSP.

What is the most satisfying aspect of the STMSP experience (e.g.. mentorship. research assignment)?

What is the least satisfying aspect of the STMSP (e.g., financial support)?

If you had to repeat the process. would you participate in the STMSP a2ain?

NOTE TO MODERA TOR: If the studenhsfocus On the financial benefits, probe to see whether anything beyond the financial support convinced them to participate in the STMSP program.

Recommendations for Change

What changes in the STMSP would you recommend (e.g.. recruitment/selection. research assignments. mentorships. level of funding)?

Closing Comments

I want to thank you for participating and for your willingness to share your time and views with me.

As I told you at the be~innin~ of our discussion. this is one of several campuses we are visiting to conduct focus groups like this one. When all of the focus groups have been completed. the results will be analyzed and a report will be submitted to the NHLBI.

Thank you for your participation.

Appendix B

Case Study Site Visit Reports

Children's Hospital
Oakland Research Institute

Children's Hospital Oakland Research Institute
Short-Term Training for Minority Students Program
Site Visit Report

A. Overview of the Short-Term Training for Minority Students Program

1. Historical Background

The Short-Term Training for Minority Students Program (STMSP) at the Children's Hospital of Oakland Research Institute (CHORI) began in 1994. Known locally as the Summer Research Intern Program (SRIP), this STMSP is currently nearing the end of its 5-year award.

2. Organizational Structure and Institutional Linkages

The SRIP is one of three STMSP programs at a major medical center, that includes a hospital, a foundation, and a research institute. The research institute, CHORI, operates the SRIP in collaboration with the Molecular and Cell Biology Department of the University of California, at Berkeley. The SRIP is funded by the Division of Blood Diseases and Resources of the National Heart, Lung, and Blood Institute (NHLBI), the Howard Hughes Medical Institute, the East Bay Neonatology Foundation; Children's Healthcare from Minneapolis, Cystic Fibrosis Research, Incorporated; and several private sources.

Hospital administrators are very supportive of the SRIP, which is viewed as an expansion of the institution~s mission to teach. While the hospital does not provide financial support to SRIP trainees, most of the staff affiliated with the program are salaried hospital employees whose time spent on the program is not compensated under the STMSP grant.

In addition to the NHLBI-funded STMSP, the SRIP administers a National Institutes of Health (NIH) ROl research supplement grant and, until recently, operated a Minority High School Students Research Apprentice Program grant. The Molecular and Cell Biology Department of UC Berkeley operates two programs that target minority students—the Biology Scholars Program and the Biology Fellows Program. Both programs, which are funded under a grant from the Howard Hughes Medical Institute, provide a major source of referrals for the SRIP. Though all of these programs share the same faculty and facilities, they do not compete with one another for administrative priority because each has its own funding source.

3. Structure of the STMSP

During the summer of 1997, the SRIP sponsored approximately 20 research training slots for undergraduate students, 10 of which were funded under the STMSP grant. Staff noted that during the program's first 5 years of operation, they served a total of six STMSP trainees per year, but as part of the program's renewal application, they were encouraged by NHLBI staff to request funding for four more slots.

In addition to the program director and program coordinator, the program includes a staff of approximately 30 individuals who served either as mentors, members of the selection committee, facilitators for student meetings, or as lecturers. However, it should be noted that staff who volunteer to work with the program include individuals from CHORI, UC Berkeley, UC San Francisco, and Roche Molecular Systems.

B. Description of the STMSP Components

1. Recruitment

Program recruitment, which is conducted annually, is handled primarily by the program coordinator. The SRIP relies on several methods to recruit potential trainees, including presentations at research symposialscience fairs, the distribution of brochures/flyers, and direct referrals from former trainees, faculty, or other institutions, in particular UC Berkeley, their primary referral source. SRIP program staff indicated that during the year, many students contact them directly by mail or telephone, expressing an interest in the program. They are invited to submit an application.

In terms of effectiveness, staff noted that referrals from former trainees and other institutions appear to yield the largest number of recruits. Staff also encouraged former trainees to reapply to the program. Because of its varying funding sources, the program does not restrict its recruitment to minority students. However, for those grants that are specific to minority populations, the following groups are targeted: American Indians, Alaska Natives. Asian! Pacific Islanders, African Americans, and Hispanics. Staff stated that while most recruitment efforts focus on local institutions, they also recruit at institutions outside the area.

Staff said they did not have any difficulty recruiting qualified applicants. Generally, they had more qualified applicants than they could accept.

2. Selection Process

Staff said that the process used to select STMSP trainees is similar to that used by NIH to review grant applications. A committee of six research scientists is appointed to review and rank each STMSP application. The committee is co-chaired by the SRIP director and former

co-director. Applications are divided into three groups, and teams of two committee members thoroughly review each application. In reviewing applications, consideration is given to trainees' GPA, previous research experience, faculty recommendations, and their personal statement.

After the initial review, the committee meets to discuss each application and ranks the top 15 applicants. While all of the criteria above are considered, the faculty recommendations and personal statements are given priority. Though a trainee's GPA is considered in the overall process, staff take great pride in the fact that it is not a major determinant in the selection of students. Once the top 15 applicants are identified, they are invited to a personal interview and ranked by the co-chairs in an effort to select the final 10 candidates. At this point in the process, ethnicity is also considered to ensure diversity within the group. The remaining five applicants are then placed on an alternate list in case one of the selected trainees is unable to participate. However, staff indicated that students rarely declined the opportunity to participate in the program. They also stated that they have not had any problems retaining trainees once the program begins.

3. Research Experiences

During the summer of 1997, the SRIP offered 120 basic research and 75 clinical research projects, 10 of which were assigned to STMSP trainees. The latter included full-time research training experiences in areas associated with heart, lung, or blood health and disease. The program operates for approximately 10 weeks between June and August. When trainees are invited to the interview they are given an overview of the available projects. Trainees are also asked about their interests and future plans, which are considered, but the program director and program coordinator makes the final determination regarding trainees' assignments to projects. Once the assignments have been made, trainees are notified by telephone or mail about the decision and, if necessary, reassignments can be made. While mentors are not involved in the assignment process, they are not obligated to accept a trainee and can also request a reassignment.

The types of responsibilities trainees are given depends on the nature of the project and ranges from leaming experimental techniques to interviewing patients to conducting biomedical analysis. Trainees may also be required to conduct literature reviews. In addition, each trainee is required to submit a written research plan that outlines the project, a final report that includes a hypothesis, specific aims, methodology, results, and conclusions; and progress reports. The reports are presented at regularly scheduled meetings throughout the program and provide an update on the research experience. All trainees are also required to prepare an oral presentation on their projects.

While each trainee is assigned to one primary mentor; depending on the structure of the project, trainees may also work with a postdoctoral fellow. However, generally only one STMSP trainee is assigned to a project.

4. Enrichment Activities

The SRIP offers trainees a host of enrichment activities, including a series of weekly seminars or conferences, grand rounds, student group meetings, and various social activities. The weekly seminars/conferences focus primarily on scientific topics and include presentations by CHORI staff or guest lecturers, and some of the seminars are designed specifically for STMSP trainees. For instance, one such seminar featured a presentation by the author of the book, "The Color of Water: Growing Up with a Jewish Mother." Trainees are encouraged but not required to attend the seminars and conferences, nor are they required to attend the weekly grand rounds. On the other hand, the bi-monthly student group meetings are mandatory and last two hours. During the first hour students meet with a group facilitator (one of the program staff) to discuss their projects. The second hour is reserved for a presentation of an important topic related to science and medicine. To encourage more group interaction among the trainees, an area of the hospital has been designated as the student lounge where trainees can gather to meet and relax. The program also sponsors an annual picnic for faculty, trainees, and their families.

In addition to the student group meetings, trainees are required to attend regularly scheduled meetings with the mentors —at least three to four times per week. During these meetings, staff discuss and review trainees' progress on their research projects and provide informal feedback. At the end of the program, mentors are asked to complete a written evaluation assessing trainee progress, and trainees are given a questionnaire that evaluates the overall program, including an assessment of their mentor. However, both of these evaluations are optional and are completed at the discretion of mentors and trainees.

Program staff also have procedures for tracking former trainees. This process, which began during the summer of 1997, involves staff mailing questionnaires to all former participants asking them to provide a permanent address where they can be contacted. If trainees respond, they are sent a followup questionnaire that asks about their current school status, major, employment, influence the program had on career decisions, and whether they are in contact with fellow trainees. This information will be collected annually and maintained electronically in the program office at CHORI.

C. Perceptions of the STMSP

1. Staff Perceptions

a. Degree of Program Success

Overall, staff viewed the STMSP as being very successful. In particular, they noted that the program was successful in terms of having increased trainee knowledge of career opportunities in biomedical and behavioral research. They stressed that participation in the program helped to transform trainees' understanding of careers in biomedical and behavioral research from abstract ideas to something more concrete and realistic. They believed this

would not have occurred without the program. Staff also believed that the program has been successful in its efforts to enhance trainees' research skills because it offers practical experience on projects that trainees work on from start to finish.

In addition, comments from trainees indicate that most feel they are part of the scientific community, but this could perhaps be enhanced if there were more opportunities for trainees to interact informally with staff and among themselves. Lastly, staff stated that the program was successful in encouraging trainees to pursue degrees and careers related to biomedical and behavioral research. Many have gone on to medical and graduate school. The program gave them the opportunity to observe individuals doing research and enjoying it.

b. Implementation Facilitators

A committed and experienced program administrator, a community-oriented program and excellent facilities were among the factors contributing to the program s success. In addition, staff stressed the fact that institutionally, CHORI is pro-education, especially in terms of minority individuals, and has helped to ensure that the program is able to provide quality research training experiences.

c. Implementation Barriers

Although the program has been successful, it has experienced some implementation difficulties, such as being unable to attract a significant number of committed mentors. Staff also indicated that the length of the program limits the types of projects available to them. The staff said that the program is becoming well-known and the number of applicants has increased, but they are not sure that they will have the funding and staff to operate it. As noted earlier, the program coordinator is a regular CHORI employee and, as it now stands, between the program and her other responsibilities, she is doing "double duty."

2. Student Perceptions

a. Overview of Focus Group

A focus group discussion was held with the 10 STMSP trainees. The group consisted of eight females and two males; four of the trainees were African American, two Hispanic, two Vietnamese, and one Filipino. (The ethnicity of one trainee is unknown). Most trainees were college seniors; however, the group also included two juniors, one sophomore, and a fifth year student. Similarly, although most trainees attended UC Berkeley, one student attended Spelman College, another attended California State University at Long Beach, and a third attended Mills College. Except for one trainee who majored in linguistics, trainees were pursuing science-related degrees, generally either in biology or psychology.

b. Recruitment and Selection Process

Trainees leamed about the STMSP through several sources, including a listing of various internship programs, faculty referrals, and a family friend. However, most trainees were referred through the Biology Scholars Program at UC Berkeley, and one trainee was a former participant. As part of the recruitment and selection process, trainees indicated that they all were required to submit a formal application, faculty recommendations. a personal statement, and a copy of their transcript. In addition, most trainees were required to participate in a personal interview with program staff. Yet one trainee, who lived out-of-state, noted that her interview was conducted by telephone. As a result, there was a general consensus among trainees that the recruitment and selection process was both fair and competitive. In addition, a few trainees said that initially they were told they had not been accepted into the program, but received notification after the program began that they had been accepted.

c. Research Experience and Enrichment Activities

Trainees were asked about their research interest during the personal interview. All trainees felt that they were given a choice about their assignments, and most were assigned to the projects they wanted. In fact, one trainee who began the program late indicated that he was assigned to the project of his choice. Arrangements were made to assign another trainee to a lab at UC Berkeley because he did not have a car to commute to Oakland. However, a few trainees indicated that they were not assigned to the kind of projects they wanted because mentors were not available.

With a few exceptions, most trainees were assigned to clinical research projects. Their responsibilities included conducting patient interviews, developing survey instruments, collecting and reviewing medical records data, and analyzing data. Trainees said that while most of their time is spent on work related directly to their project, occasionally they may have to spend time on library study. All trainees indicated that they were satisfied with their research experiences and felt that they were challenging. Some of the trainees who started the program late stated that they will continue their project into the school year.

In addition to the research training experiences. trainees stated that the program provided enrichment activities that included optional guest lecturers and seminars, student group meetings, and an annual picnic. While trainees indicated that they all attended and enjoyed the student group meetings and the picnic, several trainees stated that they wished they had taken more advantage of the guest lecturers and seminars. Trainees also stated that staff had set aside an area of the hospital for them to gather to have lunch and to talk with one another.

d. Mentorship and Evaluation

Most trainees stated that they had extremely positive relationships with their mentors and that the mentors were readily available. However, two trainees indicated that their mentors were rarely available to them. Of those trainees whose mentors were accessible, most saw

them daily. Several trainees also indicated that they had access to their mentors' home telephone or pager numbers. Regardless of how often trainees saw their mentors, they all believed that having a mentor to work with was beneficial.

Trainees indicated that their progress is reviewed informally by their mentors on a regular basis as well as during the student group meetings, which are facilitated by the program administrators. For the latter, trainees are required to complete a written progress report. Trainees also indicated that they are required to complete a form evaluating the program.

e. Future Plans

Trainees stated that they planned to attend either graduate school, medical school, or both. They also explained that for the most part, participation in the program helped them in making these decisions, and some stated that the program convinced them to pursue a research-related vs. a strictly medical career. Even when trainees knew what they wanted to do prior to participation in the program, their participation helped to crystallize their decisions.

f. Level of Satisfaction

All of the trainees expressed overall satisfaction with the program and indicated that, if given the opportunity, they would participate in the program again. The aspects of the program trainees found most satisfying included the actual research training, the independence afforded them in canying out their projects, exposure to a hospital setting, and collaboration with specific mentors. However, trainees also identified aspects of the program they were dissatisfied with. For instance, some trainees expressed disappointment that they did not have enough opportunities to interact with one another and to get to know their mentors better. Other trainees wanted more patient contact, while trainees who had patient contact stated that seeing patients who were children in pain was extremely difficult.

D. Faculty and Trainee Recommendations

1. Program Faculty and Staff

The CHORI staff made the following recommendations to improve the STMSP:

Recruitment. Direct more efforts to recruiting high school students into the program. Develop a strategy to recruit African American males into the program. In addition, staff noted that it would be helpful if candidates were identified earlier.

Research Assignments. Ensure that efforts that focus on mentoring relationships and other positive program elements are maintained.

2. Trainee Recommendations

Trainees suggested that the program should ensure that there is more interaction between trainees and more committed mentors. One trainee also suggested that it would be helpful for trainees to be assigned to more than one mentor during the course of the program to help broaden their experiences.

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Creighton University

Creighton University
Short-Term Training for Minority Students Program
Site Visit Report

A. Overview of the Short-Term Training for Minority Students Program

1. Historical Background

The Short-Term Training for Minority Students Program (STMSP) of Creighton University. located in Omaha, Nebraska, began in 1992 and is currently in its second 5-year cycle of operation. Known locally as the Short-Term Training for Minority Students (STTMS), this STMSP is one of several National Institutes of Health (NIH) grants awarded to the university.

2. Institutional Linkages

The STTMS program is administered jointly by the Departments of Biomedical Sciences and Pharmacology and the Office of Minority Affairs for Health Sciences (OMAHS). While the Department of Biomedical Sciences oversees the research assignment process, OMAHS serves as the focal point for the application process and handles all administrative matters. The Office acts as the liaison between the students and their mentors. As noted above, Creighton also operates several other science-related training programs for minority students, including: (1) a program targeted to minority high school students; (2) a post-baccalaureate program aimed at increasing minority students in medical or dental school; (3) a summer enrichment program that offers a pre-matriculation course of study for minority students awaiting admission to medical or dental school; and (4) a pre-dental summer preparatory program to facilitate the entry of minority undergraduate students into dental school.

The STTMS and the Minority High School Student Research Apprentice Program (MHSSRAP) are under the auspices of OMAHS and the Department of Biomedical Sciences. Though they share the same pooi of mentors and lab facilities, staff indicated that the programs do not compete with one another. The staff explained that despite the fact that both programs are held in high regard by university officials, in-house research monies are scarce, so other than the support of OMAHS, neither program receives institutional resources. Moreover, the university is small and not well known outside the Nebraska area. This has made it difficult for Creighton to compete with other major institutions for outside monies to help cover costs for additional resources, such as administrative support staff and lab technicians.

3. Structure of the STMSP

When the STTMS began in 1992, it had the capacity to serve a total of 10 students. However, during the summer of 1997, the number of slots was reduced to eight and the program was able to fill only six of these. Also, during its first 5 years of operation, the

program targeted only undergraduate students; however, during the summer of 1997, it began to target graduate students.

In terms of staffing, the number of available mentors varies from year to year; during the summer of 1997, six mentors were available, one for each trainee. The mentors serve as the primary contact for trainees, but pre-doctoral students may also help supervise their work in the lab.

B. Description of the STMSP Components

1. Recruitment

The STTMS uses several methods to recruit prospective trainees, including visiting targeted schools, distributing program brochures, and reviewing referrals from other trainees. The recruitment process, which is conducted on an annual basis, targets the following groups: Native Americans/Alaska Natives, Asian/Pacific Islanders, Blacks, and Hispanics. Staff noted that the geographic scope of the process is national, but the university also recruits its own students, particularly if they participated previously in the program. In addition, to expand their recruitment efforts, the program has also established links with several Historically Black Colleges and Universities (HBCUs), including Talladega College in Alabama, the alma mater of the STMSP director.

As mentioned earlier, the program was not successful in filling all slots awarded during the 1997 program year. Staff noted that during the initial recruitment process, the notion of selecting alternate candidates was considered, but this option was not implemented because the number of qualified applicants seemed sufficient. However, when two of the eight students selected did not respond to the invitation to participate in the program, the vacancies could not be filled by the time the program began.

While the recruitment process at Creighton has not changed over the years, during the summer of 1997 the program was open to graduate students. However, staff noted that graduate students are considered only if it is believed that the STTMS would benefit them, especially if they have already participated in similar programs. In addition, staff explained that while the program is open to graduate students, they are not actively recruited, nor is the fact that they are eligible mentioned in the program literature. Instead, staff stated that graduate students are expected to be aggressive enough to contact them and inquire about the program.

2. Selection Process

Once all program applications are received, they are reviewed by a selection committee comprised of the STTMS director, the program administrator, and a mentor. Each application is reviewed individually, and the committee members make their recommendations; however, the program director has the final decision on all selections. During this time, no personal or telephone contact is made with the applicant unless the applicant contacts the program. The criteria used to select trainees include their GPAs,

grades in science courses, staff recommendations, and students' expressed interest. Staff noted that expressed interest is given the most consideration.

Staff explained that if they have more qualified applicants than slots available, they consider the applicant's stated educational and professional goals to avoid selecting students who are only interested in "padding" their resumes for medical school. Rather, they prefer to select students who have not decided what to do because they perceive student curiosity as a "hallmark" of a good scientist.

In some cases, students selected for the program declined the invitation to participate, but it is believed that these students did not want to come to Creighton because they were unfamiliar with the area, not because they lacked interest in the program. Similarly, the program has experienced only one situation in which a student opted to leave the program, and that was because the student was having problems adjusting to the area. Since the program began, no changes have been made in the trainee selection process.

3. Research Experiences

The STTMS program offers trainees full-time research experiences for approximately 10 weeks between May and August. Generally, a pool of 17 research projects is available to STTMS trainees. During the summer of 1997, five research projects were chosen in areas related to vascular disease, cardiovascular disease, peptide biology, receptor biology, and pharmacology.

A listing of all available research projects is forwarded to trainees to review, along with other materials in a program registration packet. Once students arrive at Creighton, they are scheduled to meet individually with the program director, at which time they are asked to select three projects that interest them. Next, students meet with the principal investigators for the three projects to learn more about what the research entails. After this meeting, the students make a final selection, but the decision must be agreed to by the project director.

Once trainees have been assigned to a particular project, they work directly with the principal investigator of the project, who also functions as their mentor. The mentor provides day-to-day supervision of the trainees, helps them to design and set up the research experiment, and monitors their progress. In addition to the mentor, trainees may work with one to two graduate or postdoctoral students assigned to the lab. According to program mentors, while students from other programs may also be assigned to their labs, usually only one STTMS trainee will be assigned to them.

During the first weeks of the program, trainees are given time to conduct literature reviews on their respective subject areas to help them become more familiar with the research projects. At this point in the program, trainees work very closely with their mentors, spending an average of 16 to 20 hours per week together. Staff noted that after the first 2 to 3 weeks, most trainees are able to work independently in the lab, at which time their program involvement may decrease to 8 to 10 hours per week. However, when trainees begin preparing for their poster presentations, mentor hours increase again.

Trainees are basically responsible for all aspects of the research experiment. including conducting tests, recording and collecting data, and analyzing and interpreting data. After the experiments have been completed, trainees are required to compile and construct the information they have collected and prepare a poster for presentation at the end of the program session. For the most part, once the summer program is completed, students have little opportunity to continue their research projects during the academic year. However, this option is open to trainees who are Creighton students, but they are not eligible to receive stipends for their involvement.

According to staff, no changes have been made to the research assignment process or the type of projects available to trainees. The program guidelines require trainees to meet with prospective mentors before an assignment is made; however, interviews with faculty indicated that this does not occur regularly. In fact, faculty generally have not met and do not have any knowledge of the students until after the assignment has been made. Nevertheless, one staff person believed this will change under the leadership of the current program director.

4. Enrichment Activities

Enrichment activities available to STTMS trainees include weekly discussion groups and departmental seminars. The STTMS participants are encouraged, but not required, to attend the departmental seminars, that are open to the general campus and offered only once during the summer. On the other hand, weekly discussion group attendance is mandatory and participation is limited to STTMS trainees. The discussion groups are held to assess and review trainees' involvement and progress on their research projects. In the past, program mentors took turns leading the groups. However, in recent years, while the program administrator facilitates the groups, trainees have been encouraged to take the lead in discussing their role on their projects, to help them develop better communication skills and prepare for their poster presentations.

5. Evaluation/Tracking Process

As indicated earlier, program mentors meet with students regularly throughout the program, and supervise their involvement in the research projects. During this time, staff provide trainees with feedback on their progress, but no formal evaluations are conducted. Also, to keep track of trainees who have completed the program, OMAHS staff try to contact them once a year. However, staff noted that this process is not as successful as they would like it to be. Future program plans call for implementing a system of maintaining permanent E-mail addresses for each student so they can be contacted whenever necessary. In addition, individual mentors indicated that once the program has ended, trainees often contact them with requests for recommendations for graduate or medical school or employment, or sometimes just to say hello.

C. Perceptions of STMSP

1. Staff Perceptions

a. Degree of Program Success

Overall, the staff believed that the STTMS program has been successful in increasing trainees' knowledge about careers in biomedical and behavioral research. They also noted that this area should be improved, especially since many students, both undergraduate and graduate, are not really sure what careers they want to pursue. Staff also believed that more information should be provided on career opportunities outside the university setting. On the other hand, staff said that because most of the STTMS mentors are experienced investigators well versed in current research technologies, the research skills training that students received through the program is excellent. However, the extent to which the program has been successful in helping trainees develop a sense of belonging to the scientific community could be improved. Yet, they noted that this depends on student receptivity to their efforts.

All STTMS trainees were pursuing degrees in the biomedical sciences before entering the program. However, one staff person noted that one trainee, who had a strong interest in going to medical school indicated recently an interest in pursuing a doctorate degree in biomedical sciences. Similarly, staff said that while the program has been successful in enhancing trainee knowledge of careers in biomedical and behavioral research, most trainees still intend to pursue careers in medicine. However, this prompted one staff person to suggest that perhaps the program should target high school students before they enter college and set firm career goals. Overall, staff believed that the experience trainees gained from the program will help to make them better physicians.

b. Implementation Facilitators

The staff said that the program has been successful primarily because of the quality and commitment of staff available and the assistance received from OMAHS. One staff person also noted that the change in program leadership appears to have placed a greater emphasis on follow-up and accountability, factors not present during the early program years.

c. Implementation Barriers

The primary barrier to successful program implementation has been the difficulty of locating mentors who are committed to and can afford to cover the costs of having trainees in their lab. Staff noted that many faculty have indicated their interest in sponsoring a trainee, but program dollars only cover the costs of trainee housing, stipends, and travel. Mentors must be able to cover equipment and lab supply costs for students, and many are unable to. Staff also noted that they have had problems identifying students with a genuine interest in research and that often students participate in the program only because they believe it will give them an edge when applying to medical school.

2. Student Perceptions

a. Overview of Focus Group

All trainees who participated in the STTMS program during the summer of 1997 were included in the focus group discussions. The group included two males and four females—three African Americans, two Asians, and one Hispanic student. Three trainees attended Creighton, and one was a former program participant. Trainees' academic status ranged from rising sophomore to third-year pharmacology student.

b. Recruitment and Selection Process

Three trainees learned of the program through staff at their home schools; two trainees were referred to the program by OMAHS staff; and one trainee was referred to the program by another participant. All trainees indicated that they submitted a formal application to the program. However, because there was no interview process and they did not have contact with program staff prior to being accepted, they were not sure why they were selected and they did not feel they were able to comment on how competitive or fair the process was. One of the trainees who participated in the program during the previous summer was responsible for referring one current trainee to the program. Two other trainees had also participated previously in other research training programs, including the Minority Access to Research Careers (MARC) program.

c. Research Experience and Enrichment Activities

Trainees indicated that they received a listing in their registration packets describing the various research projects available through the program and were asked to indicate their assignment preferences when they submitted their applications. Trainees expressed concern that they were not given the opportunity to interview with prospective mentors prior to assignment. However, one trainee who attends Creighton explained that she requested a meeting with her mentor prior to assignment and asked that he consider working with her, but she did this on her own initiative. She also convinced him to accept another trainee in his lab.

While trainees did not have the opportunity to meet with prospective mentors, most believed that they were given a choice in selecting a research assignment but contended that the choices were limited. However, one trainee whose participation in the program was delayed indicated that she was not given a choice in her assignment, but was assigned by program staff Some trainees also expressed concern that while they were able to select their project, the projects they were assigned to were not among those they selected, particularly the cardiovascular-related projects. One trainee noted that while this does occur occasionally, it is more a result of prospective mentor's unavailability because their plans changed by the time the program began.

Trainees also indicated that if they were not satisfied with their assignments, they could request to be reassigned. For instance, one trainee indicated that he experienced some difficulties with his initial assignment, but he was subsequently assigned to another project.

Trainees explained that their responsibilities in the lab ranged from performing dissections, preparing specimens/tissue for storage, or preparing peptide solutions, to conducting analyses and preparing written reports of findings. Most of the trainees indicated that they have been assigned to research teams in the lab and that each individual is responsible for a specific task related to the overall research project/experiment. However, they were pleased that they could work on their own and had their own space. In fact, one of the trainees noted that she worked alone in the lab and interacted only with her mentor on an as-needed basis.

Trainees noted that other than the weekly discussion groups referenced earlier, enrichment activities were not available to them and that 100 percent of their program time was spent in the lab.

d. Mentorship and Evaluation

While all of the trainees indicated that they were able to work independently, the extent to which they interacted with their mentors varied from daily, to weekly, to occasionally. Some trainees were very comfortable with the level of contact they had with their mentors, while others indicated that they would like to have more contact. However, they all agreed that they had complete access to their mentors when necessary.

Trainees also indicated that while no formal evaluation is made on their performance or progress, they have been asked to evaluate the program at the end of the summer.

e. Future Plans

Two of the trainees expressed interest in continuing their pursuit of a career in research, while others indicated plans to pursue other careers, such as clinical pharmacology or medicine. Nevertheless, all of the trainees stated that the program experience enhanced their knowledge and made it easier for them to relate to classroom lectures.

f. Level of Satisfaction

Overall, trainees were satisfied with the program and indicated that the most satisfying aspect of the program was the opportunity to gain first-hand experience leaming research techniques. One trainee also stressed the fact that she was able to take what she leamed in the program and relate it to what she was leaming in the classroom.

While trainees were satisfied with the program, several believed it was too short. Also, one trainee was concerned about not being able to connect with the research staff, and another trainee wanted more immediate feedback on his or her progress in the program.

D. Faculty and Trainee Recommendations

1. Program Faculty and Staff

According to program faculty and staff, the STTMS program could be improved in the following areas:

Recruitment. Staff expressed concern that many of the students selected to participate in the program are not interested in research. They have already committed themselves to a career in medicine. Therefore, it was suggested that recruitment efforts target individuals who have a definite interest in research and those who have not committed themselves to a pre-med track or those who would be willing to pursue a combined M.D./Ph.D. degree.

Selection. Staff emphasized the importance of only selecting trainees who have an expressed interest in research.

Research Assignments. While staff believed that the quality of the research training available to students at Creighton was excellent, they recommended that the program be longer to give trainees more time to conduct their research activities. Staff said that it is critical for trainees to have some input about which labs they are assigned to and that trainees have a chance to meet and talk with all prospective mentors before finalizing assignment decisions. In addition, staff indicated that the number of available mentors should be increased to give trainees more choices.

Enrichment Activities. Staff recommended that activities focusing on providing information on career opportunities in the biomedical and behavioral research field be included as part of the program. However, it was also suggested that trainees be required to spend 100 percent of their time in the lab. This would mean that enrichment activities would have to be scheduled during evening or weekend hours.

2. Trainee Recommendations

Similar to program staff, STTMS trainees said the length of the program should be extended. Trainees wanted an advance on their stipends to help them get settled at the institution. They also expressed the desire for an orientation to help them become familiar with the institution and the surrounding community. Lastly, trainees expressed concern about feeling isolated and indicated the need for more activities to promote social interaction among peers and with program staff.

E. Conclusions

Although the Creighton University STMSP has experienced some administrative and programmatic challenges over the past five years, implementation of the program appears to have been successful. As noted earlier, unlike larger, more well-known institutions, Creighton has experienced some difficulties with their program. Among them are securing funds to engage in the type of research activities that can support STTMS trainees; hiring sufficient numbers of mentors (even though

several individuals have expressed interest) because of financial limitations; having an adequate number of research assignments related to heart, lung, or blood research; and having consistent input from students about their research assignments.

Despite the need for improvements, both staff and trainees expressed overall satisfaction with the program and believed the experiences were extremely valuable and well suited to trainees' skill levels and interests. In addition, the Creighton STTMS seems to benefit from having a dedicated team of program administrators and experienced research faculty who are committed to the goals of the program. Finally, STTMS administrators are aware of its limitations and are in the process of pursuing other avenues of program funding. The extent to which their efforts are successful will help to alleviate many of the problems mentioned above.

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Medical University of South Carolina

Medical University of South Carolina
Short-Term Training for Minority Students Program
Site Visit Report

A. Overview of the Short-Term Training for Minority Students Program

1. Historical Overview

The Medical University of South Carolina's (MUSC) Short-Term Training for Minority Students Program (STMSP) began in the summer of 1992. The STMSP is integrated into an MUSC umbrella program known as the Summer Undergraduate Research Program (SURP).

2. Institutional Linkages

The SURP is a joint collaboration between the College of Graduate Studies and the Biochemistry Department within the College of Medicine. The College of Graduate Studies is responsible for the overall administration of the program, while the Biochemistry Department handles trainee recruitment, selection, and assignment. According to program staff, the institution has been very receptive to the program, particularly the Office of the Dean within the College of Graduate Studies. This office was instrumental in establishing the SURP, which began in the 1980s, and has supported the program by providing staff. These staff members include the principal investigator, who oversees administration of the STMSP grant; a program director, who is responsible for the overall operation of the SURP; and a liaison within the College of Graduate Studies, who serves as student program coordinator.

In addition to the STMSP grant, several other research grants are operated under the SURP, including a Department of Energy grant that funds research in environmental science, a Health Careers Opportunities Program grant targeting minority students, and a State-funded program focusing on providing general research experiences and is open to all students. While all programs share the same facilities and have some joint activities, staff noted that because each program has a different focus, they do not compete with one another.

3. Structure of the STMSP

The STMSP currently targets only undergraduate students; however, staff indicated that in the future they would also like to focus on predoctoral students. Staff also noted that during its first five years of operation, the program opted to serve only six trainees so they could ensure that the program was well-established and that they had a foundation for serving a larger number of students. When the program first began, 20 students applied for the six slots, but the applicant pool increased to 46 during the summer of 1997. Moreover, the average GPA of the applicants was 3.2, indicating to staff that there are enough qualified applicants interested in the program. Therefore, staff stated that when they submit their 5-

year renewal application, they will request funding to serve an additional five trainees. resulting in a total of 10 slots for the program.

In terms of program staffing, the director noted that a total of 48 staff were involved in the operation of the SURP, including six mentors who were assigned to work directly with STMSP trainees. In addition to mentors, other staff may serve on the trainee selection committee or provide lectures, but these staff do not necessarily work specifically with STMSP trainees.

B. Description of the STMSP Components

1. Recruitment

Recruitment for the MUSC medical school, graduate school, and special programs is handled by one person. This individual conducts on-site visits to various colleges statewide and presents workshops describing the different academic opportunities at MUSC that are available to students, including the various SURP options. SURP staff provide information about services on the Internet, encourage both trainee and faculty referrals, and distribute program flyers. To mail the flyers, the program purchased a mailing list from the Educational Testing Service (ETS) and compiled a directory of the science department chairs at all 4- and 2-year colleges in the region.

Staff noted that while the SURP is open to all students, including those who attend MUSC, recruitment for the STMSP is targeted only to African American students. Therefore, in addition to the recruitment efforts described previously, the program has established linkages with several Historically Black Colleges and Universities (HBCUs) in the south, such as Savannah State and Benedict College, to help identify potential STMSP applicants. The linkage with Savannah State has been expanded to include a memorandum of agreement that arranges for staff of both institutions to apply jointly for various research grants and provides for an interchange of students and faculty.

According to program staff, of the various recruitment efforts used, the presentations, campus visits, and referrals from other STMSP trainees appear to be most effective in ensuring that a large number of qualified individuals are recruited. In fact, staff indicated that they were amazed at the number of applicants each year; and as indicated previously, the STMSP applicant pool has more than doubled over the past five years. Furthermore, while no changes have been made in the recruitment process, staff are considering using the ETS Graduate Locator Services to help identify future recruits for the STMSP, as well as other SURP options, and the graduate school.

2. Selection Process

A *5-7* member committee headed by the SURP director is responsible for selecting all SURP trainees, including those who are funded under the STMSP grant. Each prospective trainee is required to submit a formal application, a letter of interest, three letters of recommendation, and a transcript. In addition, those individuals who apply to the program

are sent a supplemental information sheet that asks them to identify their ethnicity. Once all the applications are received, the SURP program director develops a spreadsheet that summarizes applicant demographic characteristics for distribution among the selection committee. The committee reviews systemically the information, along with the faculty recommendation and letter of interest, and ranks each student. Although several factors are considered in the ranking process, the applicant's GPA is the most influential factor in the decision, and no minimum is used. However, staff noted that most applicants have GPAs of 3.7 or higher. Previous experience is not considered in the selection process, and former trainees are rarely invited to participate in the program a second time because it is felt that another assignment under the program would not be beneficial.

After the committee has completed its review, the SURP director and the principal investigator determine which students are most appropriate for the STMSP. In some instances, selected trainees have not accepted the offer to participate because they had accepted offers from other programs or were interested in programs in other locations. However, this has not been a problem because the program has always had more qualified applicants than slots available and staff have been able to draw on other students in the applicant pool. Moreover, the staff noted that once trainees agree to participate, the program rarely has problems retaining them.

3. Research Experience

During the summer of 1997, well over 50 research projects were available to SURP participants. The projects, which included both basic and clinical research experiences, offered training in the following areas: biochemistry, structural biology, biometry, cell biology, molecular biology, immunology, microbiology, pathology, pharmacology, physiology, and environmental science. The SURP projects operate for 10 to 12 weeks between June and August. In addition, staff noted that if students were interested and it was appropriate, they could continue their research training during the year. However, this has not occurred.

Before beginning their participation, students who have been accepted into the program are sent a list describing all available projects and are asked to identify three to five that interest them. Staff noted that trainees are also encouraged to conduct background research on the projects on their own or to contact prospective mentors to leam more about them. (It is unclear whether the program provides financial support for this because one staff person stated that it does not and another that it does.) Once trainees arrive at MUSC, they are asked to meet with prospective mentors and the SURP directors to determine their project assignments. While the final decision about the assignment rests with the trainee, mentors are not obligated to accept a trainee in their lab. For instance, staff noted that one mentor will not accept trainees in the lab who have not had coursework in organic chemistry. Also, if trainees are not satisfied with the assignment, they can be reassigned; however, staff noted that this has not yet occurred.

All trainees are assigned a mentor who is responsible for helping them conceptualize and design their experiment, monitoring their overall progress, and helping them with their approach to the project. However, if they are assigned to a senior faculty member, their work in the lab is often supervised by a postdoctoral fellow or graduate student. Staff also explained that while the size of each lab could range from 2 to 15 individuals, including the postdoctoral individuals and graduate students, only one STMSP trainee is typically assigned to a project. The types of responsibilities assigned to trainees in the lab are basically those that will help to expose them to various experimental approaches, such as collecting and treating cultures, using various instrumentation, or collecting and analyzing data. Trainees are also required to prepare a formal 10-minute oral presentation that is made before members of the faculty and all the other SURP participants. In addition, trainees must develop a written proposal describing what they intend to accomplish on their projects and a final report on their experience.

As noted earlier, once the program has been completed, trainees have the option of continuing their research independently. If trainees elect this option, they can eam 15 hours of academic credit from the College of Graduate Studies; however, this applies only to MUSC students.

4. Enrichment Activities

In addition to the lab experiences, the SURP sponsors a weekly seminar series for all trainees. The seminars, which are coordinated by the program director, focus on scientifically based and/or other topics that are designed to provide trainees with information such as the admissions process to graduate or medical school. Trainees may also attend various social activities, including a welcoming lunch and cookouts at the home of a faculty member. They also have free access to the campus wellness center. Though trainees are required to attend the seminar series, no penalty is imposed on those who do not attend.

Although few changes have been made in the type of enrichment activities available, it was noted that when the program first began, the former director of the Office of Minority Affairs, who helped to administer the program, organized trips for trainees to the free mission on St. John's Island. However, trainees were not very receptive to the outings, so the trips were discontinued. In terms of future changes, staff reported that they would like to offer classes on GRE/MCAT preparation. In addition, next year, MUSC will offer cultural sensitivity training to all faculty within the institution and this probably will be incorporated into the seminar series.

5. Evaluation/Tracking Process

Depending on the lab, trainees may be required to participate in a weekly meeting to discuss the overall progress of the research project. In addition, all SURP trainees are required to complete an exit survey evaluating their experience, and each mentor must complete a written evaluation assessing trainees' performance on their projects. After trainees have completed the program, the student program coordinator contacts the STMSP trainees by

telephone each year to determine what they are doing and their future plans. The Office of the Dean maintains this information.

C. Perceptions of the STMSP

1. Staff Perceptions

a. Degree of Program Success

Staff agreed that the STMSP component of the SURP has been successful. In particular, staff believed that the program has been very effective in terms of educating trainees about the field of biomedical and behavioral research and has helped to dispel many of their misconceptions. Staff said the program was successful in enhancing trainees' research skills since some had never participated in a research project. A further indication of program success is the performance of trainees on their oral presentations; according to one staff person, some were equal to many of the students who present papers at national meetings.

In addition, staff said the program has helped trainees develop a sense of belonging to the scientific community because they have the opportunity to be included as co-authors on publications and are invited to return to MUSC to present at the November research forum. Staff also noted that every effort is made to encourage trainees to pursue graduate degrees and careers in the biomedical and behavioral sciences. They noted that based on their interest in the graduate school admissions seminar, it appears that these efforts have been successful.

b. Implementation Facilitators

Factors that have contributed to the successful implementation of the SIJRP and, in turn, the STMSP are: each trainee is associated with a strong mentor; one staff person focuses solely on recruitment (which includes conducting on-site visits); staff and trainees have a stronger sense of the program goals; the program has centrally organized projects, with trainees from differing grants chosen by one committee and afforded the opportunity to present together; and weekly meetings to help establish a sense of group cohesiveness and identity.

c. Implementation Barriers

When asked about issues that may have impeded the STMSP's success, staff said that the lack of available and affordable housing has created some difficulty for trainees. Also, staff noted that because the program is organized late in the spring, trainees sometimes have to begin participation immediately after arriving, before they have a chance to get settled.

2. Student Perceptions

a. Overview of the Focus Group

A focus group discussion was held with each of the six STMSP trainees. All of the trainees were African American females; four were college seniors and two were juniors who majored either in biology or chemistry. With one exception, all of the trainees attended an HBCU.

b. Recruitment and Selection Process

Two trainees learned about the program from listings posted in their respective departments at their home institutions, and two trainees contacted the program directly. However, one student was referred to the program by a faculty member who previously worked at MUSC. It is possible that this connection may have resulted from the memorandum of agreement with Savannah State because it was the home institution for both the student and faculty member. Another student said that although she leamed initially about the program from her home institution, she applied to and was accepted into the program the previous year. However, at the time, she opted to participate in a program that offered a higher stipend.

Trainees had to submit a letter of intent as well as a formal application. However, the trainees were unsure whether the applications were submitted before or after they received notification of their acceptance. Also, two students noted that they were rejected initially but were accepted into the program later in the year. These trainees concluded that they were placed on a waiting list and their applications reconsidered when first-offered students informed MUSC that they were not going to participate in the program.

All of the trainees said the selection process was fair, especially since some of them did not have previous research experience. The trainee who declined the previous year said her decision not to participate did not affect negatively her chances when she reapplied, as she had imagined. However, a few trainees said the process could be made fairer if staff also conducted personal interviews with them because sometimes trainees could be misrepresented on paper. Trainees said that although the program's selection process was competitive, it was not as competitive as some of the more well-known research training programs. One trainee said the program was not very competitive because most of those accepted were from the South.

c. Research Experience and Enrichment Activities

All of the trainees said they had the freedom to select the research project of their choice and while they were encouraged by program staff to meet with all of the mentors with projects they were interested in, the final decision on the research assignment was theirs. Trainees were advised that if the mentor of their first choice project had already been selected, this person would work with both trainees, although this was not customary. One trainee had to request a reassignment because the mentor she selected withdrew from the program

unexpectedly. However, she had only worked with him a few days and was able to find someone else with a project of interest to her.

Trainees confirmed that their assignments were a combination of basic and clinical research experiences and included those related to research involving heart disorders, peptide-based drugs, and molecular cloning. Two trainees were assigned to projects that were not laboratory based. These projects focused on analyzing data from two existing epidemiological studies. All trainees were very enthusiastic about the responsibilities they were given in the lab, which ranged from preparing medias for cultures to synthesizing amino acids, to dissecting/staining animal tissue. All trainees who were assigned to a lab were responsible for writing up their own protocol. Several of the trainees, including those who had clinical assignments, said that they spent a considerable amount of time conducting background research on their projects.

In addition to the project experiences, trainees said that they were expected to attend weekly seminars, and the program provided them with a one-time Occupational Safety and Health Administration (OSHA) presentation that covered instruction about lab safety techniques. The general consensus on the seminars was that they were not particularly beneficial because they often did not relate to their research experiences. However, all of the trainees believed that the OSHA training was very useful. In fact, one trainee explained that while she did not appreciate the value of the training initially, she did after a chemical spill occurred in her lab.

Despite their tentativeness about the seminar series, overall trainees said that their research experiences were challenging and often helped to expand on the knowledge they gained in the classroom. Trainees also noted that as a result of the research training they received, they really had a sense of belonging to the scientific community because they leamed how to work independently in a scientific setting.

d. Mentorship and Evaluation

Even though trainees indicated that there was considerable variation in terms of how frequently they interacted with their mentor, they all felt that the mentors were accessible. For example, three trainees saw their mentor daily, one trainee saw her mentor three times a week, and another trainee saw her mentor only if she had problems. Along the same lines, all trainees stated that while they liked the independence they were afforded on their projects, they also appreciated the fact that their mentors or other lab staff were there if they needed them.

While trainees said that they are not given any formal feedback on their participation, one trainee explained that she was informed that the mentors would be required to prepare a letter describing how they benefitted from the program when it was completed. Trainees said they are required to submit attendance sheets weekly to the student program coordinator. The sheets must be signed by the mentor, confirming time spent on their projects.

e. Future Plans

With one exception, all of the trainees expressed an interest in continuing on a research track. including two trainees who want to pursue an M.D./Ph.D. Two students also indicated that the program helped them resolve their indecisiveness about their future. For instance, one trainee who previously wanted to go to pharmacy school has since opted to pursue a Ph.D. in pharmacy. Also, one of the trainees who expressed interest in an M.D./Ph.D. degree intended originally to go to medical school.

f. Level of Satisfaction

As indicated above, all of the trainees were satisfied with the program and cited the research training as the most satisfactory aspect of the program. One trainee, who had participated in three other internships, said that compared to her other experiences, the STMSP experience was very positive overall because, not only was her lab experience good, but the program provided a challenging experience in a very relaxed atmosphere.

While trainees were satisfied with the program, they expressed concern about the lack of social activities, especially those that would allow them to interact with one another, and the lack of information on careers in biomedical and behavioral research. Moreover, trainees noted that despite the fact that MUSC has a graduate and medical school, they do not have the opportunity to interact with the students. Finally, one trainee decided not to participate in the program again because the stipend offered by MUSC is not competitive with those provided by other schools.

D. Faculty and Trainee Recommendations

1. Program Faculty and Staff

Selection. For those institutions that operate several grants under one umbrella program, such as MUSC, the selection committee should be informed beforehand of the number of slots available for each.

Research Assignments. Trainees should be given the opportunity to visit the institution one month before the program begins to become better acquainted with the mentors and the specific research projects they are assigned.

Enrichment Activities. The program should include a course to prepare trainees for the GRE! MCAT.

Other.

Program staff should inform mentors about the funding source for each trainee assigned to their labs.

Program staff would like to receive formal notification about the deadline for the renewal of the STMSP grant.

2. Trainees

As noted earlier, trainees want the program to offer more social activities and opportunities to interact with medical and graduate school students. Trainees also suggested that the program should provide more financial support to assist in covering the cost of housing and food.

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University of North Texas
Health Science Center

University of North Texas Health Science Center
Short-Term Training for Minority Students Program
Site Visit Report

A. Overview of the Short-Term Training for Minority Students Program

1. Historical Background

The Short-Term Training for Minority Students Program (STMSP) at the University of North Texas Health Science Center (TCOM) at Fort Worth, Texas, renamed the Summer Minority Advanced Research Training (SMART) Program, began in 1993 and is nearing the end of its first 5-year cycle.

2. Institutional Linkages

The SMART Program is administered through the Graduate School of Biomedical Sciences in cooperation with the Office of Multicultural Affairs. The SMART Program is one of several programs for minorities at the Health Science Center. TCOM also administers the Student Teacher Applied Research Training (START) Program, designed to introduce minority high school students to research, and the Health Careers Opportunities Program (HCOP), designed to assist minority undergraduates who want to attend medical school. While these programs do not compete for monies, they do share mentors who participate in the SMART and START Programs, take classes together, and have social functions with HCOP trainees.

The president of TCOM is supportive of the SMART Program, and each year hosts a luncheon for program participants. In addition to providing release time to faculty to participate in the SMART Program, TCOM solicits in-kind contributions and other forms of financial support from outside agencies. TCOM also provides financial support for additional students to participate in the SMART Program beyond the number of slots awarded by the National Heart, Lung, and Blood Institute (NHLBI).

3. Structure of the STMSP

The SMART Program targets minority trainees in their sophomore or junior year of college who are interested in pursuing careers in research. However, exceptional trainees who have a strong interest in science are encouraged to apply at the end of their freshman year. Because the applicant pool for the SMART Program is large and NHLBI awards only 10 training slots per year, additional funding is provided by local sources, enough for six additional trainees to participate in the program.

About 30 research faculty members participate in the SMART Program as mentors and lecturers. While the positions of mentors and lecturers are held generally by senior researchers, doctoral students also serve as role models for trainees who participate in the program.

B. Description of the STMSP Components

1. Recruitment

SMART Program staff employ several different methods to attract and recruit applicants for their program. They conduct presentations at conferences, visit colleges and universities, send out brochures, and use former participants to recommend prospective students from their schools. In addition, they reserve a booth each year at the National Symposium for Minority Trainees where former SMART Program participants have the opportunity to present their research projects and to assist with recruitment.

The recruitment process for the SMART Program is ongoing throughout the year. While the program targets students throughout the United States, most of their participants are from Texas. The program specifically targets African Americans and Hispanics majoring in biology and chemistry. Program staff target students who are not thinking about attending graduate school and do not necessarily have a high grade point average (GPA). The staff believe that trainees with high GPAs are likely to attend graduate school, regardless of programs such as SMART.

The SMART Program has formal linkages with several Historically Black Colleges and Universities (HBCUs), such as Jarvis Christian College, Southern University, and Paul Quinn College. The program also has formal linkages with Texas A & M and the University of Texas at Brownville, which provide educational opportunities to a large population of minorities.

Few changes have been made in the SMART Program recruitment process since its inception. However, staff have increased efforts to recruit more Hispanics into the program.

2. Selection Process

Interested students are required to submit a formal application to the SMART Program. A committee that includes the SMART Program director, the co-director, and several research faculty and staff reviews all applications. The applicants are ranked according to overall GPA, letters of recommendation, and their personal statement and goals. Because most applicants rank fairly equal on their GPAs, more weight is placed on the personal statement and goals. Occasionally, the committee interviews applicants.

The SMART Program has never had any problems retaining trainees who were selected. However, they have occasionally had students decline the offer of acceptance because they had already accepted an admission to another program.

As a result of the ***Hopwood v. Texas*** case. TCOM, like most educational institutions in Texas, has had to suspend admission processes that give preference to minorities. The "ethnicity" category has been removed from the formal application. The program now requires each applicant to submit a photo with the application to ensure diversity among the trainees and to continue to meet criteria set by the National Institutes of Health.

3. Research Experiences

The 11-12 weeks training program is full-time and runs from May until the first week in August. Trainees who wish to continue their research during their academic year can do so if they choose. The SMART Program offers more than 30 projects in the areas of biochemistry, molecular cell biology, and clinical research. Some specific areas of research this year include the effects of hypertension on coronary blood vessels, pharmacology and aging, and the effects of exercise on adolescents' cardiovascular system. During the first week of the program, trainees attend a presentation on projects that are available to them. They then select three choices. Project staff match trainees with their projects based on their interest and experience. Occasionally, a trainee is not satisfied with the assignment and is allowed to request reassignment to another project.

Trainees are assigned to one person in a lab who supervises the trainees' research. Usually this person is also the trainees' mentor. Although most mentors are research faculty, some are graduate students who work in the lab.

The level of responsibility that trainees assume in a research lab depends on their experience, enthusiasm, and willingness. Trainees conducting clinical research may be responsible for pre- and post-operative care and data analysis, while trainees conducting basic research may be responsible for designing experimental protocols, ordering chemicals, and deciding which drug to use in an experiment. Trainees are taught specific techniques and procedures, but it is their responsibility to apply these techniques to answer specific questions related to their projects. Occasionally, if the project warrants it, more than one trainee can be assigned to a project, but each trainee has to present his or her own work.

4. Enrichment Activities

In addition to research training in the labs, trainees are required to attend weekly seminars on different subjects and topic areas. These subjects vary from year to year, depending on the research being conducted at TCOM. By attending the seminars, trainees not only gain more subject knowledge, they also have the opportunity to see how scientists present data in that type of forum. Trainees can apply for and receive one credit hour for attending the seminars. Trainees also have daily access to the Computer Leaming Center, where they can take lessons to develop new skills or work on their research projects.

5. Evaluation/Tracking Process

Trainees are evaluated on their knowledge of a particular topic area (usually discussed during seminars) at the beginning and end of the training session, using pre- and post-test instruments. The evaluations are conducted by the SMART Program co-directors and mentors.

To track former trainees, questionnaires are mailed out once a year. The questionnaires are designed to gain information about the trainees' current address, educational status, employment status, and the impact the SMART Program has had on their career choices. Data from the questionnaires are maintained in hard copy format in the SMART Program office.

C. Perceptions of STMSP

1. Staff Perceptions

a. Degree of Program Success

All staff believed that the SMART Program has been very successful at increasing trainees' knowledge of careers and opportunities in biomedical and behavioral research. They saw the SMART Program as an opportunity to expose trainees to a wide range of research in a short time. Most staff agreed, however, that the program has been only moderately successful at enhancing trainee research skills. Staff felt that it often takes longer than 10 weeks to develop some skills. In addition, the level and type of skills taught varies across individual mentors and labs. Likewise, in terms of developing trainees' sense of belonging to the scientific community, staff thought that the SMART Program has been only moderately successful. Participating in the program is the beginning of the process of belonging. Trainees have the opportunity to conduct a project, present to peers, and possibly publish an abstract. Staff said that the barrier to the process of belonging was trainees' thinking that they are still in class—they need to make the transition to thinking of themselves as scientists.

While staff believed that the SMART Program has been fairly successful at encouraging trainees to pursue degrees related to biomedical or behavioral science, they also agreed that the program has been only somewhat successful at stimulating trainee interest in pursuing careers in biomedical or behavioral research. Because the program began in 1993, they think it is too early to determine its success in this area.

b. Implementation Facilitators

Three factors appear to be key to the successful implementation of the SMART Program. The first, the existence and availability of funding through NIH made it possible for TCOM to provide opportunities to a wider group of minority trainees. Second, from the beginning, the administration has been very supportive of the SMART Program by granting faculty release time, securing additional funding, and soliciting in-kind contributions. Lastly, all

staff agree that the SMART Program would not be as successful as it is without the initial and ongoing commitment from faculty and staff, including the graduate students.

c. Implementation Barriers

The lack of funding appears to be the SMART Program's greatest challenge. Staff believe that the level of the grant award does not cover the cost to faculty of having trainees in their labs. Trainees use supplies and resources that have to be acquired with existing funds. Moreover, staff state that the grant award is insufficient to fund all qualified trainees who apply to the program.

2. Student Perceptions

a. Overview of Focus Group

Of the 10 trainees funded by NHLBI who participated in the focus group, 3 were male and 7 were female. The group was represented mostly by African Americans, there were three Hispanics, and one Caucasian. Most trainees were rising sophomores and juniors from Texas colleges and universities who majored in biology and other natural sciences.

b. Recruitment and Selection Process

Most trainees leamed about the SMART Program through the science department at their respective colleges and universities. Some saw the SMART Program brochure attached to the bulletin board in their science department, and others heard about it directly from their science professors. One trainee leamed about the program at a science fair. Another trainee leamed of the SMART Program through his participation in the START Program.

Trainees' experience with the selection process differed. All trainees submitted applications; however, some submitted theirs after the deadline yet were still selected to participate. Some trainees received telephone calls asking whether they would participate, if selected. A few trainees had interviews, others did not. All trainees agreed that they were selected because of their interest in the biomedical field and because they excel academically. One trainee had participated in the SMART Program previously, and one had been in a similar program at TCOM, the START Program.

c. Research Experience and Enrichment Activities

Trainees chose their project assignments after attending a 1-day presentation in which faculty shared their research. Afterward, trainees were asked to select three projects that most interested them and rank them from one to three, with number one being their top choice. Although most trainees received their top picks, all agreed that the presentations, which were made on their first day, were too brief and overwhelming. In terms of flexibility in assignments, two trainees changed their assigned labs after the first day without any problems, and one student changed the topic area of his project but remained in the same lab.

The trainees appeared to be very pleased with the level of responsibilities afforded them in the labs. According to the trainees, they understood clearly that the success or failure of their projects was dependent on them, and that they were responsible for setting their own hours and completing their work in a timely manner. They were able to design their own projects and had full access to all lab equipment.

Trainees who conducted clinical research had a lot of patient contact—taking vital signs, assisting with EKGs, explaining medications, getting informed consent paperwork completed, and acting as a witnesses to certain procedures. Trainees with basic research projects responsibilities ranged from collecting fish egg samples to "running the dogs" every morning.

The trainees did not appear as satisfied with their enrichment activities, particularly the lectures/seminars. They said that the amount of time spent in seminars a week, four hours, and the time of day the seminars were scheduled, the afternoon, detracted from valuable time that could have been spent on their projects. Some trainees admitted to skipping the seminars on a regular basis.

Despite their lack of enthusiasm about attending seminars, trainees believed that they had developed a real sense of belonging to the biomedical community. As a result of what they learned in the labs, trainees said they could participate confidently in a scientific conversation with other scientists.

d. Mentorship and Evaluation

The level of contact with the mentors varied among the trainees. Some saw their mentors daily, while others had difficulty finding them. However, all the trainees who saw their mentors less often conceded that when they really needed them, their mentors were available and they leamed a lot from them. Some mentors even gave their home telephone numbers to the trainees. The trainees admitted that their transition into the lab would have been difficult without mentors. The trainees also appeared to be very grateful to the graduate students and other lab staff, acknowledging that these people often filled a void left by mentors who were not as accessible.

The trainees were aware that they needed to complete an exit interview at the end of the program but were unaware of any other type of evaluative procedures.

e. Future Plans

Although the SMART Program introduced the trainees to research as an alternative to medical school, most students admitted that they still planned to attend medical school. The students felt that having direct contact with patients would be more rewarding than being "stuck" in a lab. Two students who planned initially to attend medical school said they were unsure of their future plans after participating in the SMART Program.

f. Level of Satisfaction

Overall, most of the trainees perceived the SMART Program as a good one, even though it did not change their career choices. They said the program gave them good lab experience that will be useful regardless of what they choose to do in the future. The trainees found that the most satisfying part of the program was the people they met—other trainees, their mentors, and the graduate students. They also conceded that the least satisfying aspect of the program was the lectures/seminars. Most of the trainees said that given the opportunity, they would participate again and would recommend the program to other students.

D. Faculty and Trainee Recommendations

1. Program Faculty and Staff

The staff had the following recommendations to improve the SMART Program:

Recruitment. The SMART Program staff recommended increasing the budget for recruitment. This would allow the program to target and reach a wider audience. An increase in funds would also allow the program to offer a larger stipend. The staff suggested that they lose potential trainees to other programs that offer more money. Staff also recommended that they form more partnerships with other schools and attend more minority programs where trainees from all over are represented.

Selection. The SMART Program staff recommended that they require more focused, detailed letters of recommendation from faculty.

Research Assignments. Some staff suggested that trainees should receive information about the types of research projects available prior to the start of the program. Other staff recommended that trainees rotate or visit all labs prior to making a project selection. Staff also recommended that trainees be given more time to complete their projects and that they write abstracts for the National Minority Research Symposium (NMRS). The suggestion was also made to have a faculty jury award prizes to the top three projects.

Enrichment Activities. Staff suggested that seminars be more formal. Trainees should be required to present and do writing assignments to make them accountable in the classroom. The staff also believed that there should be more incentives. Currently, there are no tests or grades. Staff also recommended incorporating medical art into the seminars. For instance, staff could provide a presentation on how to make slides for presentations.

Other recommendations. Staff also suggested extending the program by at least 2 weeks or even extending it beyond the summer months, so they could have some type **of** symposium during the academic year. Staff also recommended computerizing the SMART Program tracking system so they can keep better "tabs" on their trainees and send them information, such as newsletters.

2. Trainee Recommendations

SMART Program trainees recommended that the program send information about research projects to trainees before the start of the program. They also suggested increasing the faculty presentation of research topic areas from one day to two days, thus giving them time to digest the information and make more informed decisions about projects. The trainees also suggested that the lectures and seminars topics be more diverse. This year, all the lectures and seminars focused on some aspect of diabetes. The trainees would have preferred a wider range of topic areas. They also suggested changing the seminar time period, which is currently scheduled in the afternoon. Trainees suggested scheduling the seminars in the morning, so they are less disruptive to the time they spend in the lab.

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Yale University Short-Term Training for Minority Students Program

Yale University
Short-Term Training for Minority Students Program
Site Visit Report

A. Overview of the Short-Term Training for Minority Students Program

1. Historical Background

The Yale University Short-Term Training for Minority Students Program is known locally as the Biomedical Science and Training Enrichment Program (BioSTEP). The BioSTEP program, which began serving students in the summer of 1991, is currently in its second 5-year cycle of operation.

2. Institutional Linkages

The BioSTEP program is administered through the Office of Multicultural Affairs (OMCA) in the School of Medicine. The program director, who serves as both the dean of Multicultural Affairs and an associate professor of medicine in cardiology, has been with the program since its inception. Although he was not the initial principal investigator, he helped to establish the program design and structure. According to staff, the BioSTEP program has been well received institutionally and is considered a "flagship" program by university officials. The university also provides additional funding to the program to support the cost of trainee lodging as well as coverage for both the director and administrative staff. In the past, the university also provided meals for the trainees.

OMCA oversees the operation of two other research programs that target minority students: the New Haven High School Student Summer Program and the Minority Medical Education Program (MMEP). Lastly, the university funds a year-round research program for minority students, but this program is not administered by OMCA.

Staff noted that the above programs have had strong linkages to one another, and the connections have been complimentary rather than competitive. For instance, although all of the programs target minority individuals interested in the sciences, each focuses on a specific group (e.g., high schoolers vs. undergraduates). Moreover, the MMEP program is often used to identify potential BioSTEP applicants, and the supplement to the ROl grant supported some of the research projects to which BioSTEP trainees were assigned.

3. Structure of the STMSP

The BioSTEP focuses its services solely on undergraduate students. When the initial grant application was submitted, staff indicated their intent to serve medical students, too. However, the university-supported research grant was used to serve this population. During its first five years of operation, BioSTEP was awarded 10 slots. This number has more than doubled and under its second 5-year renewal the program currently has 20 to 24 students.

Staff explained that the program actually served 20 students during the first program cycle. However, only 10 slots were funded by the National Heart. Lung, and Blood Institute (NHLBI), and the other 10 were funded through ROl grants. Because this arrangement was not administratively feasible, the university requested additional monies from NHLBI to fund all the slots.

B. Description of the STMSP Components

1. Recruitment

Recruitment efforts for BioSTEP, which are handled by OMCA staff, include presentations at research symposia/science fairs, visits to targeted schools, announcements in newsletters and scientific journals, and distribution of brochures and flyers. However, staff noted that the most effective recruitment methods are direct referrals from faculty, former trainees, and other institutions, particularly Historically Black Colleges and Universities (HBCU). The recruitment process, conducted on a national basis beginning in October, targets primarily Black and Hispanic rising juniors and seniors. Efforts are not directed at recruiting former trainees because it is believed that the average student is not well served by spending two summers in the program. However, former trainees are not prohibited from reapplying to the program—they are simply not encouraged.

Although BioSTEP has not experienced any major challenges in recruiting a sufficient number of qualified applicants, several changes have been made in the recruitment process over the course of the program's implementation. When the program first began, efforts were directed only at Black students because the former principal investigator had established ties at several HBCUs, such as Xavier University, and Morehouse and Spelman colleges. However, in the last few years, staff began targeting Hispanics. Now efforts are also directed to schools in the southwest and western states, as well as major Ivy League schools in the northeast that serve a significant number of Hispanic students. In addition, recruitment efforts have been broadened to include a larger audience, resulting in an increase from 60 to 250 applicants per year. Staff also began the recruitment efforts earlier so that prospective trainees can be notified earlier. In the past, recruitment did not begin until November/December and students were not notified until March/April. But by beginning the recruitment process in October, trainees can be notified as early as February, which helps prevent the BioSTEP from having to compete with other related outside programs.

2. Selection Process

A committee comprised of the BioSTEP director and eight university faculty is responsible for the selection of program trainees. Each trainee application is reviewed initially by a team of two committee members, and all applications are then reviewed by the entire committee as a group. Applications are scored on a scale of 1 to 5, using the following criteria: GPA, faculty recommendations, and the student's personal statement as to why he or she applied to the program. Although there is no set limit on GPA, this is the most influential factor considered, and generally few applicants have GPAs lower than 3.0.

Once scored by the committee, the applications are ranked and the 24 with the highest rankings are selected; all others are placed on a waiting list. These applicants often are referred to other programs or invited to reapply to BioSTEP the following year. Occasionally, selected trainees do not accept the offer to participate in BioSTEP because they have already been accepted into other programs. In fact, during the summer of 1997, staff noted that this occurred with at least seven of their original picks, so they are planning to move acceptance notice date up by another 2 weeks. Beyond changing the selection notification date, no other changes have been made in the process.

3. Research Experiences

Both clinical and basic research projects in the areas of heart, lung, and blood disorders are available to BioSTEP trainees. Although the actual number of projects vary each year, more than 100 mentors were recruited to participate in the program during the summer of 1997. The research assignment process is determined largely by the BioSTEP director, with input from other selection committee members. Assignment decisions are based on trainees' expressed interests as noted in their personal statements, academic level, and past research experience. However, the program does not advertise specific labs, but rather lists in the application packet the range of general research areas available. As a result, trainees are not given a choice in the assignment, nor are mentors informed of the trainees assigned to them until after the decision has been made. If the match between trainee and mentor does not appear to be appropriate, the program director can make a reassignment, but staff noted that the need for reassignment has not occurred often.

BioSTEP operates between June and August and lasts approximately 10 weeks. Trainees are assigned to the projects full-time. Each trainee is assigned one primary faculty person who serves as a mentor and works directly with the individual to design experiments and monitors their progress. Although trainees often meet with their mentors on a daily basis, they may also be assigned to work with a postdoctoral individual in the lab. In addition, two university medical students serve as student coordinators and are responsible for helping to monitor student progress.

The type of responsibilities trainees are given varies with each project, but they are designed generally to introduce students to new skill levels and those that can be completed within the 2-month program period. These may include conducting literature reviews, designing and developing ideas for carrying out experiments, leaming the proper use of instruments, performing specific protocols, preparing solutions, and conducting data analysis. Before the end of a project, each trainee is also required to prepare a final oral or poster presentation. Also, some mentors may invite trainees to contribute to a publication and require them to prepare an abstract. In addition, if trainees attend Yale, they have the option to continue their research during the academic year. However, generally only one or two Yale students are in the program.

Staff noted that they spend quite a bit of time during the initial start-up of the project helping trainees design and develop ideas for carrying out their assignments, and they are also very involved in helping trainees prepare their final presentations. However, it appears that

trainees work independently or with a postdoc for most of their assignments. On average, staff noted that they spend approximately 10 to 30 percent of their time working with the BioSTEP trainees. However, staff also explained that although only one BioSTEP trainee may be assigned to them, they have trainees from other programs assigned to their labs.

In addition to the lab assignment, BioSTEP trainees may ask to be to linked with a clinical faculty member who is responsible for taking them on rounds. However, this opportunity is optional and although program staff provide trainees with the names of interested faculty, trainees must initiate the contact.

4. Enrichment Activities

In addition to research assignments, the BioSTEP offers trainees enrichment activities. These include a 1-hour weekly seminar designed specifically for program trainees. The seminars include various speakers who focus on their own research experiences and sessions that provide trainees with information on admission procedures to graduate and medical school. BioSTEP trainees are also invited to attend seminars/lecture series offered by other programs or specific departments. For instance, one of the mentors noted that his department offers four lectures per week and he encourages the trainees in his lab to attend them. In addition to the seminar series, the program provides a host of social activities organized by the student coordinators, such as hikes, trips to Broadway performances, and talent shows.

5. EvaluationlTracking Process

To monitor students' progress during the program, both the BioSTEP director and a member of his staff meet with trainees regularly to discuss their experiences on the projects. Mentors also meet with trainees either daily, weekly, or biweekly to review their progress. Staff also prepare formal written evaluations to assess trainee performance on the projects and their presentations. The evaluations are shared with the trainee as well as the BioSTEP staff and used to help identify areas that could improve program operations.

Staff also explained that efforts are in place to maintain contact with former trainees. The program director noted that BioSTEP staff contact all trainees at least once yearly by telephone. Plans are underway to begin mailing questionnaires to trainees requesting updated addresses and phone numbers and their current education and career plans. In addition to the program's efforts, trainees often contact either program staff or their mentors to request recommendations needed for employment and or graduate/medical school admissions. As a result, staff have been able to keep track of approximately 90 percent of all former program participants.

C. Perceptions of STMSP

1. Staff Perceptions

a. Degree of Program Success

Staff believed that BioSTEP has been extremely successful, particularly in terms of increasing trainees' knowledge of careers in the biomedical field. They noted that one of the reasons for this success is the university itself. In particular, staff explained that because Yale is relatively small and has a multitude of resources available, such as a medical and nursing school, trainees are able to leam how research is practiced in both clinical and basic research settings. In terms of the program's success in enhancing trainees' research skills, for the most part staff agreed that most trainees are performing beyond what they knew before participating in the program. But it was pointed out that the limitations of a 10-week program impose restrictions on the kinds of skills trainees are able to develop. Also, staff thought that the opportunities to help trainees develop a sense of belonging to the scientific community are certainly available, and most faculty and lab personnel extend a welcoming hand to all trainees. However, given the fact that trainees spend a great deal of time under the tutelage of a postdoc, occasionally they may be paired with someone whose personality may not mesh with theirs so this connection is not always made.

Because most trainees are already committed to pursuing a degree in the biomedical sciences when they enter the program, staff did not feel that there has been a great deal of impact in this area. However, although some staff believed it was difficult to assess the extent to which the program prompted any significant changes in trainees' career interests, others stated that the program was very successful along these lines. In fact, it was noted that some trainees who were previously interested in practicing medicine only changed their goals to the combined pursuit of practicing medicine and conducting research.

b. Implementation Facilitators

Staff noted that several factors have contributed to the success of the program, including strong leadership, an energetic and nurturing staff, a talented pool of applicants, and a broad range of research opportunities. It was also stressed that, institutionally, Yale has provided a tremendous amount of support to BioSTEP which has helped to stabilize its success.

c. Implementation Barriers

As far as implementation barriers are concerned, staff stated that occasionally they have had difficulty finding mentors in certain disciplines because in the summer a lot of faculty leave the area. It was also stressed that the pool of minority students from which the program can draw is limited and there is a great deal of competition across institutions for them. Lastly, New Haven is limited in terms of social outlets, and although the program has attempted to provide alternatives outside the city, it has been difficult for many trainees to adjust to the local environment.

2. Student Perceptions

a. Overview of Focus Group

Approximately half of the trainees who participated in the BioSTEP program during the summer of 1997 were included in the focus group discussions. The group consisted of eight females and one male and included seven African Americans and two Latino students. Although none of the trainees had previously participated in BioSTEP, four indicated that they had participated in other science-related research programs targeted to minority students.

b. Recruitment and Selection Process

The trainees indicated that they leamed about the program through a variety of avenues including an Internet search, a research conference, faculty referral, and information available through their home institutions. Trainees also indicated that they were required to submit a formal application, two letters of recommendation, a transcript, and a personal statement. Because personal interviews are not part of the selection process, trainees concluded that the information they submitted was the basis on which their selection was made. But several trainees believe that the process is not fair because it is easy for applicants to misrepresent themselves on paper or be overlooked as strong candidates because their strengths may not be portrayed accurately on paper. Still others felt that the high costs associated with conducting personal interviews reduce dollars available to support trainees once selected. The overall conclusion was that the current process is the only feasible way to select program participants.

c. Research Experience and Enrichment Activities

Trainees confirmed that they were not involved directly in the research assignment process but rather were asked to indicate a preference for areas of interest on their applications. As a result, some trainees stated that they felt the assignments were random, with little consideration given to their past experience, while others felt that the assignments were matched to their stated preferences and past experience was taken into account. Nevertheless, they expressed satisfaction with their placements.

Trainees indicated that the range of their responsibilities included preparing stock solutions, conducting dissections, learning proper use and maintenance of instrumentation, and interpreting and analyzing data. The level of previous experience varied among trainees, while all felt that the research training was very enriching and worthwhile. In addition to basic research activities, some of the assignments involved clinical experiences. For instance, one of the trainees was assigned to work in a psychiatric center on a computer-imaging project. Also, as part of the basic research assignment, another trainee noted that she accompanies her mentor on rounds at the university hospital one day a week.

While trainees noted that they spent the majority of their time in the lab, they are required to attend the weekly seminar series. Some trainees also indicated that they spent time doing

library study or conducting literature searches, as assigned by their mentors. Trainees said that the enrichment activities were beneficial in helping them relate more to what is happening in the labs. Moreover, the opportunity to interact with other faculty/students helped the trainees feel more a part of the scientific community.

d. Mentorship and Evaluation

Most of the trainees indicated that they were fairly independent in the lab but, if necessary, their mentors and/or a postdoc were always available to answer questions or provide direction. However, a few trainees stated that they had difficulty reaching their mentors. Similarly, some trainees expressed concern about having to rely more on the postdoc and stated that they would prefer to work more directly with their assigned mentors. But one trainee indicated a preference for working with the postdoc, who appeared to have more time to give. The extent to which trainees see their mentors also varies, with some doing so daily and others only once a week. Regardless of frequency, all trainees agreed that having a mentor is beneficial.

In terms of evaluation, trainees stated that they meet with the program staff to discuss their progress once during the course of the program and they also meet regularly with the program coordinators who help to monitor their progress. Trainees noted that program staff are very responsive to their concerns.

e. Future Plans

Several of the trainees indicated that they either are interested in pursuing a Ph.D. or a combination MD/Ph.D., and they credited the program with influencing their education and career decisions. Other trainees who expressed satisfaction with the program plan to attend medical school only.

f. Level of Satisfaction

All trainees indicated that they were satisfied with the BioSTEP and agreed that the most satisfying aspect of the program was the research training available. The least satisfying aspects of the program included not being able to access all of the resources available and problems trainees experienced with program logistics—particularly those related to the distribution of stipends and meal allowances. In fact, the latter was such a concern for some trainees that they indicated if these areas were not improved they would not participate in the program again, nor recommend it to other students. In addition, several trainees who were also Minority Access to Research Careers (MARC) students expressed concern that their stipends were lower than those paid to other BioSTEP trainees and that they were not informed of this before they accepted the offer to participate in the program.

0. Faculty and Trainee Recommendations

1. Program Faculty and Staff

The following recommendations were suggested to improve program operations:

Recruitment. Although staff felt that the program is successful in recruiting qualified applicants for the BioSTEP, it was stressed that more effort has to be made to ensure that more minority males apply to and are selected for participation.

Research Assignments. Staff recommended that the program length should be extended, especially in order to ensure that trainees have sufficient time to participate fully in both lab and enrichment activities.

Enrichment Activities. Although it was acknowledged that sessions on patient care are available it was suggested that this activity be incorporated into the overall program structure and provided to all trainees.

Other. In addition to those noted above regarding specific program components, the following general recommendations were made:

- Information describing the different STMSPs should be made available for distribution among all grantees.
- A uniform policy on the payment of stipends for various research training programs should be established to avoid competition for trainees on the basis of which program pays a higher stipend.
- Minority investigators need to be encouraged to support more minority students in their labs.
- Funds should be made available to help cover the costs of staffing and social activities for trainees.

2. Trainee Recommendations

Recommendations from trainees included hiring an additional administrative staff person, providing more clinical research experience, increasing the size of the stipends, and developing more intense recruitment efforts targeting male students.

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