

Feasibility Study for the INBRE Program Evaluation

Final Report

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by



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CONTENTS

1.	OVERVIEW	1
2.	BRIN/INBRE AWARDS	2
3.	FEASIBILITY STUDY METHODOLOGY	3
3.1.	Recommended Study Design for the Outcome Evaluation	3
3.2.	Advisory Committee	4
3.3.	Data Collection Approach	4
3.4.	Site Visits	5
3.5.	Data Collection Forms	5
3.6.	Collection of Secondary Data	6
4.	CONCLUSION	7

EXHIBITS

EXHIBIT 1.	INBRE Networks Funded in September–October 2001
EXHIBIT 2.	Study Questions for the Evaluation of the BRIN/INBRE Program and Study
EXHIBIT 3.	Conceptual Framework
EXHIBIT 4.	Operational Definitions and Data Sources for the Variables in the Conceptual Framework
EXHIBIT 5.	Members of the Advisory Committee
EXHIBIT 6.	Charge to the Advisory Committee
EXHIBIT 7.	Agenda for the Meeting of the Advisory Committee for the Design of the BRIN/INBRE Evaluation
EXHIBIT 8.	Discussion Guide for Site Visits
EXHIBIT 9.	Data Collection Form: Network Snapshot at End of Year 1
EXHIBIT 10.	Data Collection Form: Network Overview Years 1–5
EXHIBIT 11.	Data Collection Form: Institution Form Years 1–5
EXHIBIT 12.	Data Collection Form: Project Leader Form Years 1–5
EXHIBIT 13.	Instructions for Completing Data Collection Forms
EXHIBIT 14.	Cover Letter to Principal Investigators Participating in Pilot Test of Data Collection Forms

APPENDIX A: Proposal for NIH Evaluation Set-Aside Funding

1. OVERVIEW

The National Center for Research Resources (NCRR) has responsibility for establishing and implementing the Institutional Development Award (IDeA) program, which was legislatively mandated by the National Institutes of Health (NIH) Revitalization Act of 1993. The primary intent of the IDeA program is to enhance biomedical and behavioral research in specific geographic areas by increasing the research competitiveness of institutions located in states with “historically low aggregate success rates” in obtaining NIH grant awards. Eligibility for the IDeA program is limited to those states that attained a success rate of less than 20 percent in competing for NIH grants or that received average NIH support (excluding IDeA funding) of less than \$100 million from fiscal year (FY) 1999 to FY 2003.¹ The IDeA program was specifically designed to help institutions in IDeA-eligible states become more successful in achieving NIH grant funding, particularly research project grant funding.

Annual support provided for IDeA program activities has increased dramatically, from \$750,000 in FY 1993 to \$222 million in FY 2005. Altogether, 53 institutions in 23 states and Puerto Rico² received IDeA funding during FY 1993–2002 through one or more of the following types of IDeA awards:

- Early IDeA awards (FY 1993–98)
- Shannon-like awards (FY 1998–2000)
- Centers of Biomedical Research Excellence (COBRE) awards (FY 2000–present)
- IDeA Network of Biomedical Research Excellence (INBRE) awards, formerly known as Biomedical Research Infrastructure Network (BRIN) awards (FY 2001–present)

The goal of this task (conducted from October 2004 to September 2005) was to design a full-scale outcome evaluation of the first five years of the BRIN/INBRE program (FY 2002–2006), with an emphasis on the BRIN/INBRE networks that were initially funded in September–October 2001. The BRIN/INBRE feasibility study was conducted by the QRC Division of Macro International Inc. (ORC Macro). Mary Look, Ph.D., served as project director; Marcia Carlyn, Ph.D., was senior evaluation consultant; and the other members of the ORC Macro study team included June Bray, Ph.D., Susan Akin, Ph.D., Vaishali Joshi, Jane Manahan, and Emily Wuerker.

The full-scale outcome evaluation of the BRIN/INBRE program is expected to be conducted in 2007–2009. Its primary purpose is to determine the extent to which the BRIN/INBRE states and networks achieved specific short- and long-term goals during their first five years, but it will also provide insight on why some states and networks achieved more success than others in developing an integrated research network, recruiting and retaining new faculty, developing the

¹ Previous eligibility criteria included a 20-percent success rate and less than \$70 million on average in NIH support from FY 1995 to FY 1999.

² The 23 states and Puerto Rico (hereafter referred to as 24 states) were Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming.

pipeline of students participating in research and advancing in research careers, and enhancing their research competitiveness. This report describes the methodology used in conducting the feasibility study and its major product: a recommended study design for the full-scale outcome evaluation of the BRIN/INBRE program.

2. BRIN/INBRE AWARDS

The focus of the full-scale evaluation is the initial set of BRIN/INBRE networks that received funding for five years beginning in September–October 2001. These networks comprise 255 participating institutions in 24 IDeA states (see Exhibit 1).³ The BRIN/INBRE awards, ranging up to \$2 million per year, were much larger than the previous IDeA awards, and fewer institutions received them.

Beginning in FY 2002 as the BRIN program, this component of the IDeA initiative was designed to promote the development, coordination, and sharing of research resources and expertise with the expectation that both research opportunities and the number of competitive investigators in IDeA-eligible states would increase. The BRIN awards were also intended to enhance the caliber of scientific faculty at undergraduate schools within IDeA states, with the intent of attracting more promising students to those institutions. Each initial BRIN award provided up to three years of support.

Each BRIN grant established a statewide network of research and undergraduate institutions in order to:

- Develop a competitive biomedical research base
- Foster collaborations to enhance the development of the next generation of researchers
- Provide support to mentor junior faculty
- Develop areas of potential research through staff development, startup funding for new hires, support for professional technical staff, funds to renovate laboratories and provide equipment, and access to research resources
- Strengthen research management within institutions

In 2004, the BRIN program was recompeted as the INBRE program. In this phase of the program, each INBRE grantee is expected to establish a statewide multidisciplinary research network with a scientific focus that will:

- Build and strengthen the lead and partner institutions' biomedical research expertise and infrastructure
- Build and increase the research base and capacity by providing research support to faculty, postdoctoral fellows, and graduate students at the participating institutions

³ Although it was one of the initial BRIN awardee states, New Hampshire was no longer receiving BRIN or INBRE funding at the conclusion of the feasibility study, so this state's network was not included in the proposed study design for the full-scale evaluation.

- Provide research opportunities for undergraduate students and serve as a “pipeline” for undergraduate students to continue in health research careers within IDeA states
- Provide outreach activities to students at undergraduate institutions, community colleges, and tribal colleges participating in the state’s network
- Enhance science and technology knowledge of the state’s workforce

3. FEASIBILITY STUDY METHODOLOGY

3.1. Recommended Study Design for the Outcome Evaluation

The purpose of the feasibility study was to determine the optimal design for a full-scale outcome evaluation of the INBRE program. The recommended study design is described in detail in a comprehensive proposal (see Appendix A) that NCRR may use in the future to obtain NIH evaluation set-aside funding. The proposal was written in the format recommended by the *NIH Program Evaluation Guide: How to Develop a Proposal for Evaluation Set-Aside Funding* (i.e., 12-point type, one-inch margins, maximum 15 pages) and includes the following sections:

- Section 1: Program To Be Evaluated
- Section 2: Need for an Evaluation
- Section 3: Evaluation Design
- Section 4: Data Collection and Analysis
- Section 5: Evaluation Results
- Section 6: Project Management
- Section 7: Budget Estimate (to be completed by NCRR)

A total of 10 study questions are recommended for the full-scale evaluation (see Exhibit 2). To answer the questions, information will be collected from the 23 INBRE networks that meet the study criteria, the lead and participating institutions where they were established, and the project leaders of the various research projects. The study will focus on two units of analysis: states and networks. Four study questions (Q1–Q4) involve predictor variables, three questions (Q5–Q7) involve the achievement of program goals (outcome variables), one question (Q8) involves the relationship between predictor variables and the achievement of program goals, and two questions (Q9–Q10) involve comparison groups. For questions involving states, performance during FY 2006–2007 will be compared with baseline performance in one or more years prior to initial INBRE funding. For those involving INBRE networks, performance during Year 5 will be compared with baseline performance during Year 1.

The recommended study design is based on a conceptual framework illustrating how the INBRE program is intended to work (see Exhibit 3). Specifically, the framework identifies baseline characteristics of INBRE states and networks as well as program activities that are expected to influence the achievement of the program’s short- and long-term goals (outcome variables). The conceptual framework also includes two variables describing the amount of NIH resources allocated to the INBRE program during the first five years. For the outcome evaluation, data will be collected for each of the 44 variables shown in the conceptual framework. During the

feasibility study each variable was operationally defined, pilot tests were conducted to identify the best data sources for each variable, and a final set of operational definitions and data sources was recommended for the full-scale evaluation (see Exhibit 4).

3.2. Advisory Committee

Near the end of the feasibility study, a seven-member advisory committee was convened to discuss the proposed evaluation design with the study team and NCRR staff. The advisory committee consisted of distinguished researchers and administrators from IDeA and non-IDeA states as well as an economist. The names and institutional affiliations of the advisory committee members are provided in Exhibit 5, the charge to the committee is presented in Exhibit 6, and the agenda for the one and one-half day meeting is presented in Exhibit 7. The members were asked to assess the proposed study design for the full-scale evaluation, address several specific issues, and recommend improvements to the design. After a thorough discussion, consensus was achieved in each area. The final recommendations of the advisory committee resulted in revisions to the conceptual framework, study questions, operational definitions, and data collection forms, and were incorporated into the proposed design for the INBRE evaluation (see Appendix A).

3.3. Data Collection Approach

Several different types of data gathering procedures were pilot tested during the feasibility study, including site visits, data collection forms, document reviews, Web site reviews, and database extractions. An emphasis was placed on obtaining the type of qualitative information expected to be associated with overall network success, and various pilot tests were conducted to assess the feasibility and merit of different data collection strategies. Training sessions were held with members of the study team to ensure that the data collection and coding procedures were well understood before they were applied.

The pilot sites for the feasibility study were selected using a process that ensured that they were reasonably representative of the larger group of INBRE networks. The following selection criteria were used:

- Structure of the INBRE network (i.e., number of INBRE institutions, number of cores, research focus, type of research, presence of an outreach core)
- Program's research experience
- Committees, including INBRE subcommittees
- NIH rank of lead institution
- Number of medical centers in the state
- Number of doctoral degree granting institutions
- Access to graduate students
- Number of COBRE centers
- Geographic location
- State population

3.4. Site Visits

Four site visits were conducted at INBRE networks in April–May 2005. The site visits were initiated with a telephone call to the INBRE principal investigator (PI) that described the study and the purpose of the site visit; invited his or her participation and cooperation; established the dates of the site visit; and conveyed the study team’s expectations regarding the agenda, a facilities tour, and the types of INBRE participants who would be asked to participate in individual or group discussions. During the telephone call, the PI was asked to designate a site visit coordinator to assist with making arrangements. Prior to each site visit, the center received e-mail from the study team confirming the dates of the visit and describing the study in more detail. Data collection forms were also sent to the PIs for their review and comment. Additional telephone discussions were held with the PI and/or site visit coordinator to identify potential respondents, finalize the agenda, and answer questions.

Each site was visited by two members of the feasibility study team and the NCRR Project Officer. During each visit, the study team toured the INBRE laboratories and core facilities at the lead institution and other network institutions and met with the PI (and co-PI if applicable), core facility managers, new faculty recruited under BRIN/INBRE, several junior and senior investigators, INBRE administrative staff, university administrators and officials, undergraduate and graduate students who received training under BRIN/INBRE, research and facilities staff, steering committee members, and at least one member of the center’s external advisory committee (EAC) (usually via conference call). The discussion guide developed for the site visits is provided in Exhibit 8. The guide includes a short introduction (with an assurance that specific information will not be included in the final feasibility study report) and a series of open-ended discussion questions designed to collect data on specific study variables, particularly center characteristics expected to be related to success in achieving INBRE goals. For the feasibility study, the study team used a relatively unstructured format to accommodate the variety of individuals participating in the onsite discussions. Most of the questions were open-ended in order to obtain the respondent’s overall impression of different aspects of the INBRE program, using probes to understand the respondent’s perception of the more qualitative components of specific variables in the conceptual framework.

3.5. Data Collection Forms

A pilot test was conducted to develop a set of four data collection forms (Microsoft Excel spreadsheets) that could be completed by INBRE participants without excessive respondent burden:

- Network Snapshot at End of Year 1 (see Exhibit 9)
- Network Overview Years 1–5 (see Exhibit 10)
- Institution Form Years 1–5 (see Exhibit 11)
- Project Leader Form Years 1–5 (see Exhibit 12)

Instructions for completing the data collection forms were also pilot tested (see Exhibit 13). Before the data collection forms were pilot tested, portions of the Network Snapshot and Network Overview forms were prefilled by feasibility study team analysts, who extracted

information from the network's Year 1 progress report and implementation plan. A cover letter (see Exhibit 14) requesting participation and describing the purpose of the study was sent with the data collection forms and instructions for completion of forms to the INBRE network PIs chosen to participate in the pilot test. The data collection forms were pilot tested with eight INBRE networks in June–July 2005. An 89-percent response rate was achieved for the data collection forms. The forms were revised following feedback from the pilot test respondents in order to reduce the respondent burden without compromising the quality and completeness of data. The initial data collection forms were all returned within 17 business days and took 13–24 hours for each responding network to complete. For the full-scale evaluation, it is anticipated that the respondent burden can be further reduced by developing the forms as a Web-based survey, restructuring some questions as lists with checkboxes, and conducting more extensive training with the study team analysts on how to extract specific data from annual progress reports and enter that information into the survey database that will then populate the data collection forms.

3.6. Collection of Secondary Data

In addition to the primary data collected through site visits and data collection forms, the following strategies were used to collect secondary data from various data sources:

- Document review (e.g., summary statements for the initial BRIN grant applications and the competitive renewal type 2 applications, annual progress reports, and implementation plans)
- Web site reviews (e.g., NIH grants Web site, INBRE Web sites)

The feasibility study team analyzed the content of the INBRE grant applications and summary statements produced after the applications were reviewed by NIH scientific review groups. Annual progress reports submitted by INBRE networks, which included supplementary data requested by NCRR to augment the basic information submitted on the U.S. Department of Health and Human Services Public Health Service Non-Competing Grant Progress Report (PHS 2590), were also analyzed. Of particular interest was the network's participating institution information; information about the activities of the center's EAC and Steering Committee; the development of cores, including the administrative, bioinformatics, and other research cores; other facilities and infrastructure development; subprojects, including the lead investigator on the subproject and other participating staff; publications, presentations, and national meetings attended by the INBRE participants; and mentoring and strategic planning activities described in the progress report narratives.

Based on the document reviews, Web site reviews, and extraction of data to select networks for participation in the site visits and data collection form pilot tests, the following sources of secondary data are recommended for the full-scale evaluation:

- NIH Consolidated Grant Applicant File (CGAF)
- National Library of Medicine PubMed database
- NIH Computer Retrieval of Information on Scientific Projects (CRISP) database

- National Science Foundation (NSF)-NIH Survey of Graduate Students and Postdoctorates in Science and Engineering (graduate student survey)
- NSF-NIH Survey of Science and Engineering Research Facilities
- Department of Education's (ED) Integrated Postsecondary Education Data System (IPEDS)
- ED National Study of Postsecondary Faculty
- U.S. Census Bureau data
- *The Chronicle of Higher Education*
- Reports of the Association of American Medical Colleges and other organizations representing medical schools and medical centers
- Reports of the National Governors Association and National Association of State Budget Officers
- BRIN/INBRE requests for applications, grant applications, summary statements, Year 1 implementation plans, annual progress reports, and annual budgets approved by NCCR
- Web sites developed by NIH, BRIN/INBRE networks, academic institutions, and organizations involved in medical education

4. CONCLUSION

In summary, the feasibility study for the INBRE evaluation was implemented successfully and achieved its major objective: to design a full-scale outcome evaluation of the first five years of the INBRE program (FY 2002–2006). The feasibility study demonstrated the value of using a collaborative approach and employing the expertise of a broad range of INBRE participants, an advisory committee, and dedicated NCCR staff. The recommended study design is presented as a comprehensive proposal for conducting the outcome evaluation. This major evaluation, planned for FY 2007–2009, will determine the extent to which the INBRE states and networks achieved specific short- and long-term goals during their first few years. It will also provide additional insight on why some states and networks achieved more success than others in strengthening their biomedical research expertise and infrastructure; increasing their research capacity through support of faculty, postdoctoral fellows, and graduate students; and providing research opportunities to undergraduates to increase the pipeline of students who will continue in health research careers. The results of the full-scale outcome evaluation should be very helpful to NCCR administrators in enhancing program management and addressing congressional inquiries regarding the impact of the INBRE program. The results are also expected to be useful to INBRE investigators and administrators in other NIH Institutes and Centers and organizations that are interested in evaluating the success of programs to enhance the research capacity of states and institutions or to develop networks of excellence in biomedical research.

EXHIBIT 1

INBRE NETWORKS FUNDED IN SEPTEMBER–OCTOBER 2001

INBRE Networks Funded in September–October 2001

	Lead Institution(s)	Number of Participating Institutions	Geographical Location
AK	U of Alaska Fairbanks	4	Other
AR	U AR, U AR for Med Sci, U AR - Little Rock	17	South
DE	Delaware Biotech Institute	6	East
HI	U Hawaii SOM	20	Other
ID	U Idaho	9	West
KS	U Kansas Med Center	10	Midwest/Central
KY	U Louisville	13	East
LA	Louisiana State U	6	South
ME	Mt Desert Island Biol Lab	6	East
MS	U Southern Mississippi	7	South
MT	Montana St U - Bozeman	14	West
NE	U Nebraska Med Center	12	Midwest/Central
NV	U Nevada / Reno	7	West
NH	U New Hampshire	11	East
NM	New Mexico State U	5	West
ND	U North Dakota	12	Midwest/Central
OK	U Oklahoma Hlth Sci Ctr	13	Midwest/Central
PR	Ponce SOM, UCC, UPR Med Sci, UPR Rio Piedras	14	Other
RI	U Rhode Island	6	East
SC	U South Carolina at Columbia	31	South
SD	U South Dakota SOM	8	Midwest/Central
VT	U Vermont	6	East
WV	Marshall U SOM, WV U Hlth Sci Ctr	9	East
WY	U Wyoming	9	West
	Total	255	

EXHIBIT 2

STUDY QUESTIONS FOR THE EVALUATION OF THE BRIN/INBRE PROGRAM AND STUDY

STUDY QUESTIONS

FOR THE EVALUATION OF THE BRIN/INBRE PROGRAM

1. What level of NIH resources (in terms of funding and staff support) was allocated to the BRIN/INBRE program during its first five years?
2. What were the baseline characteristics of the IDeA states at the start of the program in each of the following areas?
 - a. Previous research experience
 - b. Number of medical schools, major medical centers, and research institutes
 - c. State's financial health
 - d. State's commitment to higher education
 - e. Population density of the state
 - f. Number of existing COBRE centers
 - g. State's contribution to BRIN/INBRE

At the start of the program, were some states quite different than others with respect to their baseline characteristics? If so, what were the distinguishing characteristics of the different types of states?

3. What were the baseline characteristics of the BRIN/INBRE networks at the end of Year 1 in each of the following areas?
 - Number of participating institutions
 - Number of faculty members in scientific fields
 - Number of undergraduate and graduate degrees awarded in science and health-related fields
 - Total area (square feet) available for research
 - Lead institution's research experience
 - PI's administrative and research experience
 - Core directors' management and research experience
 - Number of participating research faculty
 - Research experience of participating faculty
 - Extent of previous collaboration among the institutions
 - Institutions' commitment to support BRIN/INBRE

At the end of Year 1, were some networks quite different than others with respect to their baseline characteristics? If so, what were the distinguishing characteristics of the different types of networks?

4. How did the BRIN/INBRE networks implement the following program activities recommended by NCCR during their first five years?
 - Upgrading research facilities
 - Improving bioinformatics capability

- Recruiting additional investigators
- Offering new courses, research training, and grantsmanship workshops
- Mentoring junior faculty and students
- Providing research support to investigators (release time, shared facilities, laboratory personnel)
- Addressing the needs of baccalaureate, community, and tribal colleges
- Ensuring effective management and communication systems
- Working with advisory committees and evaluators to assess needs, develop goals, and track progress

Which strategies were used to implement each type of activity? Who was involved in developing and/or implementing particular activities? Were any strategies revised during this period? Were there major changes in how the BRIN/INBRE grantees allocated their grant funding during Years 2–5? If so, why were the budget allocations revised?

5. To what extent were the BRIN/INBRE networks able to achieve the following short-term goals during their first five years?

- Improved research facilities and support services, including bioinformatics
- Successful recruitment of junior and senior investigators from different disciplines
- Increased collaboration among researchers and institutions
- More students majoring in science and health-related fields
- More students and faculty participating in research activities
- More science faculty and permanent research positions
- More scientific publications and presentations
- More applications for NIH research grants
- More undergraduate students pursuing science and health-related careers.

6. To what extent were the BRIN/INBRE networks able to make progress in achieving the following long-term goals during their first five years?

- Development of a statewide multidisciplinary research network
- More science courses and programs offered
- More undergraduate and graduate degrees awarded in science and health-related fields
- Increased success competing for NIH research grants
- Increased state and institutional commitment to research
- Increase in the proportion of total NIH funding received by the state

7. Did distinctive patterns of success emerge? Did some networks make more progress in achieving certain goals and other networks make more progress in achieving other goals?

If so, what were the most common patterns of success? Which networks were similar to each other with respect to the types of goals they achieved?

8. Why were some BRIN/INBRE networks more successful than others during their first five years?

To what extent were specific state and network baseline characteristics related to subsequent success in achieving BRIN/INBRE goals? Comparing the more successful networks with less successful networks, can states with strong potential and/or networks with strong potential be identified from their baseline characteristics? To what extent were specific program activities related to overall success in achieving BRIN/INBRE goals? To what extent were specific program activities related to achieving the goals associated with the most common patterns of success? Can best practices be identified?

9. Comparing BRIN/INBRE networks that had a higher number of science faculty in FY 2001 with networks that had fewer science faculty, which group made more progress during the next five years in increasing the number of science faculty? Which group made more progress in expanding the pipeline of students pursuing science and health-related careers? Were there significant differences in the performance of the two groups during this period?
10. Comparing the BRIN/INBRE undergraduate institutions with a comparable group of academic institutions in non-IDeA states that offered similar degrees and had about the same number of graduates and science faculty in FY 2001, which group made more progress during the next five years in increasing the number and percentage of two-year and four-year degrees awarded in science and health-related fields? Which group made more progress in increasing the number of science faculty? Were there significant differences in the performance of the two groups during this period?

EXHIBIT 3
CONCEPTUAL FRAMEWORK

FOR THE EVALUATION OF THE BRIN/INBRE PROGRAM



Outcome Variables

EXHIBIT 4

OPERATIONAL DEFINITIONS AND DATA SOURCES FOR THE VARIABLES IN THE CONCEPTUAL FRAMEWORK

EVALUATION OF THE BRIN/INBRE PROGRAM

**Proposed Operational Definitions and Data Sources
for the Variables in the Conceptual Framework**

**NIH RESOURCES
SUPPORTING THE
BRIN/INBRE
PROGRAM**

Measures describing the amount of NIH resources allocated to the BRIN/INBRE program (in terms of funding and staff support) during the program's first five years.

Annual Funding for the
Program Grantees

The average annual funding that NCRR allocated to the BRIN/INBRE program grantees (total direct and indirect costs) during FY 2001-2006. (Data source: NIH budget reports)

Number and Types of
NCRR Staff Involved

The total number of NCRR staff members and the percent effort that different types of staff directed toward BRIN/INBRE activities during FY 2001-2006. (Data sources: telephone and on-site interviews with NCRR staff)

**STATE
CHARACTERISTICS
AT BASELINE**

Measures describing key characteristics of each IDeA state at the start of the BRIN/INBRE program that are expected to be predictive of the grantee's subsequent success in achieving the program's goals.

Previous Research
Experience

The extent to which the state was successful in obtaining NIH research grants prior to BRIN/INBRE, as measured by the average number of competitive NIH extramural grants (of any type) awarded per year during FY 2000-2001 to institutions in the state. (Data source: NIH Consolidated Grant Applicant File)

Number of Medical
Schools, Major Medical
Centers, and Research
Institutes

The total number of accredited MD-granting medical schools, OD-granting colleges of osteopathic medicine, DVM.-granting colleges of veterinary medicine, and major teaching hospitals and health systems in the state in FY 2001, as well as the number of nonprofit biomedical research organizations and independent research hospitals in the state that received NIH support (of any type) during FY 2000-2001. (Data sources: Liaison Committee on Medical Education, American Osteopathic Association, American Veterinary Medical Association, Council of Teaching Hospitals and Health Systems sponsored by the Association of American Medical Colleges, NIH grants web site).

State's Financial Health	The state's average budget balance (funds the state could use to respond to unforeseen circumstances after budget obligations had been met) during the period FY 2000-2001, represented as a percent of the state's expenditures during the year. (Data source: <i>The Fiscal Survey of States</i> published annually by the National Governors Association and the National Association of State Budget Officers)
State's Commitment to Higher Education	The average percent of total state expenditures appropriated for higher education during the period FY 2000-2001. (Data source: <i>The Chronicle of Higher Education</i>)
Population Density of the State	The average number of persons per square mile residing within the state in 2001. (Data source: U.S. Census Bureau)
Number of Existing COBRE Centers	The total number of different COBRE centers in the state in FY 2001. (Data source: National Center for Research Resources, NIH).
State's Contribution to BRIN/INBRE	The extent to which the state contributed to the BRIN/INBRE program in terms of funding (as a percent of total state expenditures), personnel, facilities, equipment, and/or other types of research support during Year 1. (Data sources: BRIN grant application and summary statement, Year 1 implementation plan and progress report, data forms, telephone interviews with BRIN/INBRE participants)

NETWORK CHARACTERISTICS AT BASELINE

Measures describing characteristics of each BRIN/INBRE network in Year 1 that are expected to be predictive of the grantee's subsequent success in achieving the program's goals.

Number of Participating Institutions	The total number of different institutions represented on the network's Steering Committee at the end of Year 1. (Data sources: BRIN/INBRE Year 1 progress report, data forms)
Number of Faculty Members in Scientific Fields	The total number of full-time faculty members in the state in FY 2001 who worked in science and health-related departments at academic institutions offering undergraduate and/or graduate degrees, including faculty members at community and tribal colleges. (Data source: Department of Education's Integrated Postsecondary Education Data System, Department of Education National Study of Postsecondary Faculty)
Number of Undergraduate and Graduate Degrees Awarded in Science and Health-Related Fields	The total number of undergraduate and graduate science and health-related degrees conferred by institutions in the state during FY 2001. (Data sources: Department of Education's Integrated Postsecondary Education Data System, Doctorate Records File)
Total Area (Square Feet) Available for Research	The total net assignable square feet (NASF) of research space reported for science and health-related fields in FY 2001, as reported by colleges, universities, hospitals, and other research organizations in the state. (Data source: NSF-NIH Survey of Science and Engineering Research Facilities)

Lead Institution's Research Experience	The extent to which the network's lead institution(s) were experienced in obtaining NIH research grants prior to BRIN/INBRE, as measured by the number of different NIH awards (of any type) the institution(s) held in FY 2001. (Data source: NIH Consolidated Grant Applicant File)
PI's Administrative and Research Experience	The extent to which the grant's initial principal investigator was experienced in administering complex research programs and was experienced in obtaining research grants, as measured by (1) the type and scope of administrative positions the person had held prior to FY 2001; and (2) the number of different NIH and other extramural awards the person held in FY 2001. (Data sources: NIH Consolidated Grant Applicant File, BRIN grant application and summary statement, Year 1 implementation plan and progress report)
Core Directors' Management and Research Experience	The extent to which the directors of the network's cores (e.g., bioinformatics core, training and mentoring core, science research core) appointed in Year 1 were experienced in managing core facilities and/or training programs and were experienced in obtaining research grants, as measured by (1) the type of management positions (if any) each person had held prior to FY 2001; and (2) the number of different NIH and other extramural awards each person held in FY 2001. (Data sources: NIH Consolidated Grant Applicant File, BRIN grant application and summary statement, Year 1 implementation plan and progress report)
Number of Participating Research Faculty	The total number of research faculty participating in the BRIN/INBRE program at the end of Year 1. (Data sources: BRIN Year 1 progress report)
Research Experience of Participating Faculty	The extent to which the faculty members participating in the BRIN/INBRE network at the end of Year 1 were experienced in obtaining research grants, as measured by the total number of NIH extramural and other awards each faculty member received during FY 1997-2001. (Data sources: NIH Consolidated Grant Applicant File, BRIN grant application and summary statement, Year 1 implementation plan and progress report)
Extent of Previous Collaboration Among the Institutions	The extent to which the research faculty and administrators at the institutions represented on the network's Steering Committee at the end of Year 1 had collaborated on non-BRIN projects prior to FY 2001, as measured by (1) publications in refereed scientific journals co-authored by BRIN participants from different institutions; and (2) other types of collaborations (e.g., seminars, workshops, recruitment efforts, grants, other research projects). (Data sources: PubMed, BRIN grant application and summary statement, data forms, web sites)
Institutions' Commitment to Support BRIN/INBRE	The extent to which the participating institutions contributed to the BRIN/INBRE program in terms of funding, personnel, facilities, equipment, and/or other types of research support during Year 1. (Data sources: BRIN grant application and summary statement, Year 1 implementation plan and progress report, data forms, telephone interviews with BRIN/INBRE participants)

**PROGRAM
ACTIVITIES**

Strategies employed by each BRIN/INBRE network during Years 1-5 to implement activities recommended by NCRR that are expected to be predictive of the grantee's subsequent success in achieving the program's goals.

Upgrading Research
Facilities

Strategies used to establish, manage, and expand state-of-the-art core research facilities and laboratories (including teleconferencing facilities), purchase scientific equipment, hire facility managers and laboratory personnel, and increase the use of research facilities and equipment. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

Improving Bioinformatics
Capability

Strategies used to provide BRIN/INBRE participants throughout the state with electronic access to state-of-the-art biomedical databases (e.g., repositories, cell lines, models, assays, microarrays), data management and analysis tools (e.g., data mining and visualization software), methods for confidential data sharing, and technical personnel having expertise in bioinformatics techniques. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

Recruiting Additional
Investigators

Strategies used to identify, recruit, and select high-quality junior and senior investigators (including women and underrepresented minorities) for permanent positions at participating BRIN/INBRE institutions in areas relevant to the network's research agenda. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

Offering New Courses,
Research Training, and
Grantsmanship
Workshops

Strategies used to develop and implement formal and informal research training opportunities, including new academic programs, courses, workshops, seminars, symposia, and other training opportunities designed to enhance the research knowledge and technical capabilities of BRIN/INBRE participants. Examples include training involving specific research topics, bioethics, grantsmanship, scientific writing, and the use of bioinformatics and other research techniques. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

Mentoring Junior Faculty
and Students

Strategies used to ensure that high-quality one-on-one mentoring is provided to BRIN/INBRE project leaders as well as graduate and undergraduate students interested in pursuing research careers, which should include procedures for selecting and changing mentors if needed. Mentoring should include clear and frequent feedback on the trainees' scientific progress as well as guidance and support in areas relevant to their career interests (e.g., mastering laboratory techniques, writing abstracts and scientific papers, writing grant proposals, hiring lab personnel, purchasing research equipment, tracking grant expenses, identifying and working with collaborators and NIH personnel, developing career goals, and prioritizing tasks). (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

Providing Research Support to Investigators	Strategies used to ensure that BRIN/INBRE investigators (especially the project leaders) have adequate release time and research support facilities, equipment, and services needed to conduct high-quality research, such as core laboratories and other shared facilities with well-trained technicians, laboratory personnel (e.g., postdocs, lab technicians, graduate students), bioinformatics support, on-line access to library resources, and assistance in securing and administering research grants. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)
Addressing the Needs of Baccalaureate, Community, and Tribal Colleges	Strategies used by the doctoral degree-granting institutions to ensure that the baccalaureate and two-year institutions are actively engaged and consider themselves to be true partners in the BRIN/INBRE network. Examples include visiting the different campuses to understand their strengths as well as their needs; offering short courses, workshops, seminars, symposia, conferences, and other research training opportunities; helping them expand their science curricula and recruit faculty and students in science departments; discussing issues with them via teleconference as well as in person; including their research interests and skills in databases and web sites; and developing an equitable system for distributing research resources to all BRIN/INBRE participants. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)
Ensuring Effective Management and Communication Systems	Strategies used to ensure that the day-to-day needs of BRIN/INBRE participants are effectively addressed. Examples include maintaining good communication throughout the network, being responsive to participants' needs, identifying potential conflicts and effectively resolving any disputes that may arise, encouraging collaborations, reducing unnecessary paperwork, establishing and maintaining a center web site, and ensuring that written communications involving the BRIN/INBRE network (e.g., web site content, progress reports, newsletters) are clear. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)
Working with Advisory Committees and Evaluators to Assess Needs, Develop Goals, and Track Progress	Strategies used by the External Advisory Committee, Steering Committee, and evaluators to assess the needs of BRIN/INBRE participants, develop short-term and long-term goals for the network, consider alternative approaches, and assess on a regular basis how much progress has been made in achieving the goals. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)

SHORT-TERM PROGRAM GOALS

Measures of the extent to which each BRIN/INBRE network and the state as a whole made substantial progress in achieving the most important intermediate objectives of the BRIN/INBRE program by Year 5.

Improved Research
Facilities and Support
Services, Including
Bioinformatics

Increase in the number of (1) state-of-the-art research facilities and laboratories; (2) major scientific instruments and bioinformatics tools; (3) total net assignable square feet (NASF) of research space; (4) facility managers, laboratory technicians, and IT personnel; (5) individuals using the research facilities and equipment; and (6) training workshops involving scientific equipment, bioinformatics tools, grantsmanship, and other research-related topics. (Data sources: BRIN/INBRE progress reports, NSF-NIH Survey of Science and Engineering Research Facilities, data forms, web sites)

Successful Recruitment
of Junior and Senior
Investigators from
Different Disciplines

Increase in the number of external candidates successfully recruited to permanent positions in BRIN/INBRE departments, including (1) individuals who had served as a PI or subproject leader on one or more major NIH research project grants (e.g., R01, P01, P50, M01, U01, U19) or equivalent non-NIH grants; and (2) individuals who had less research experience but were trained to conduct biomedical and/or behavioral research. The new recruits as a group should represent at least three different disciplines that are relevant to the BRIN/INBRE research areas being pursued. (Data sources: BRIN/INBRE progress reports, data forms, web sites)

Increased Collaboration
Among Researchers and
Institutions

Increase in (1) the number of new research projects involving BRIN/INBRE participants from different departments and/or institutions; and (2) the number of publications in refereed scientific journals co-authored by BRIN/INBRE participants from different departments and/or institutions. (Data sources: PubMed, BRIN/INBRE progress reports, data forms, web sites)

More Students Majoring
in Science and Health-
Related Fields

Increase in the number of undergraduate, graduate, and postdoctoral students majoring in science or health-related fields at BRIN/INBRE institutions. (Data sources: NSF-NIH Survey of Graduate Students and Postdoctorates in Science and Engineering, BRIN/INBRE progress reports, data forms)

More Students and
Faculty Participating in
Research Activities

Increase in (1) the number of undergraduate, graduate, and postdoctoral students participating in BRIN/INBRE activities; (2) the number of undergraduate, graduate, and postdoctoral students and research associates employed in research programs; (3) the number of research faculty serving on internal or external peer-review groups; and (4) the number of research faculty who have experience serving as PI or co-PI of an NIH research grant of any type. (Data sources: BRIN/INBRE progress reports, data forms)

More Science Faculty
and Permanent Research
Positions

Increase in the number of full-time faculty positions in science and health-related departments and permanent non-faculty research positions at BRIN/INBRE institutions. (Data sources: Department of Education's Integrated Postsecondary Education Data System, Department of Education National Study of Postsecondary Faculty, BRIN/INBRE progress reports, data forms).

More Scientific Publications and Presentations	Increase in (1) the number of papers published in refereed scientific journals that were authored or co-authored by BRIN/INBRE project leaders or other BRIN/INBRE participants; and (2) the number of oral and poster presentations given at national or international conferences that were authored or co-authored by BRIN/INBRE project leaders or other BRIN/INBRE participants. (Data sources: PubMed, BRIN/INBRE progress reports)
More Applications for NIH Research Grants	Increase in the number of initial and amended competitive research grant applications (of any type) submitted to NIH by BRIN/INBRE institutions, especially research project grant applications having a BRIN/INBRE project leader as the PI or a subproject leader. (Data source: NIH Consolidated Grant Applicant File)
More Undergraduate Students Pursuing Science and Health-Related Careers	Increase in (1) the number of undergraduate students from BRIN/INBRE baccalaureate institutions who were accepted into a graduate program involving biomedical or behavioral research; and (2) the number of students from BRIN/INBRE community and tribal colleges who transferred to a baccalaureate institution to pursue a science or health-related degree. (Data sources: BRIN/INBRE progress reports, data forms, telephone and on-site interviews with BRIN/INBRE participants)
LONG-TERM PROGRAM GOALS	Measures of the extent to which each BRIN/INBRE network and the state as a whole made progress in achieving the most important long-term objectives of the BRIN/INBRE program by Year 5. It is expected that some long-term goals may not be fully achieved until Year 15.
Development of a Statewide Multidisciplinary Research Network	The extent to which the BRIN/INBRE network was successful in (1) identifying and developing linkages among the participating institutions' research facilities and support services (including bioinformatics), academic programs, formal courses, and other training opportunities that involved science and/or health-related research; (2) developing policies and procedures to increase the sharing of these resources; and (3) reducing any duplication of resources. (Data sources: BRIN/INBRE progress reports, data forms, web sites, telephone and on-site interviews with BRIN/INBRE participants)
More Science Courses and Programs Offered	Increase in the number of academic programs (offering degrees, certificates, or minors), formal courses, and other training opportunities (e.g., summer programs, workshops, conferences, symposia) sponsored by BRIN/INBRE departments that involved science and/or health-related research. (Data sources: BRIN/INBRE progress reports, data forms, web sites)
More Undergraduate and Graduate Degrees Awarded in Science and Health-Related Fields	Increase in the average number of undergraduate and graduate science and health-related degrees conferred each year by BRIN/INBRE institutions. (Data sources: Department of Education's Integrated Postsecondary Education Data System, Doctorate Records File)

Increased Success Competing for NIH Research Grants	Increase in the total number of competitive NIH extramural awards awarded to institutions in the state, especially research project grants having a BRIN/INBRE project leader as the PI or a subproject leader. (Data source: NIH Consolidated Grant Applicant File)
Increased State and Institutional Commitment to Research	The extent to which the state as a whole and the participating BRIN/INBRE institutions increased their support for and capacity to conduct biomedical and behavioral research, as measured by improved incentives and policies for recruiting high-quality researchers, encouraging experienced research faculty to mentor junior faculty and students, and encouraging all researchers to pursue productive collaborations with other investigators. Increased commitment to research will also be measured with other variables (e.g., more state-of-the-art research facilities and support services, more science faculty and permanent research positions). (Data sources: BRIN/INBRE progress reports, data forms, telephone and on-site interviews with BRIN/INBRE participants and senior administrators at the institutions)
Increase in the Proportion of Total NIH Funding Received by the State	Increase in the overall NIH ranking of the state as a whole and the participating BRIN/INBRE institutions, based on total dollars awarded annually by NIH. (Data source: NIH grants web site)

EXHIBIT 5

MEMBERS OF THE ADVISORY COMMITTEE

FEASIBILITY STUDY FOR THE BRIN/INBRE EVALUATION

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EXHIBIT 6

CHARGE TO THE ADVISORY COMMITTEE

FEASIBILITY STUDY FOR THE BRIN/INBRE EVALUATION

Charge to the Advisory Committee

1. Assess the proposed design for the BRIN/INBRE evaluation:

- Conceptual framework
- Study questions
- Data collection strategies
- Data analyses

2. Recommend improvements in the study design:

- Are the short-term goals reasonably achievable during the first five years of BRIN/INBRE support? During Years 1-5, how much progress is likely to be made in achieving the long-term goals? Should specific goals be omitted or should any other goals be added?
- Are the predictor variables likely to be related to success? Should any be omitted or should any other predictors be added?
- Are the study questions appropriate? How could they be improved? In particular, are the study questions involving comparison groups (questions 8-10) likely to reveal useful information?
- Are the data collection strategies appropriate? Are they designed to minimize the burden on site personnel? For example, to answer study question 7 which examines *why* some BRIN/INBRE networks were more successful than others, we have proposed a combination of site visits and telephone interviews with participants at 8 of the more successful and 8 of the less successful networks, based on the results of study questions 5 and 6. Does this approach seem to be a reasonable and cost-effective way to answer this important question and obtain the type of qualitative data needed to describe “best practices”? How could the proposed data collection strategies be improved?
- Are the data analyses appropriate? How could they be improved?

EXHIBIT 7

**AGENDA FOR THE MEETING OF THE ADVISORY COMMITTEE FOR
THE DESIGN OF THE BRIN/INBRE EVALUATION**

Agenda
Meeting of the Advisory Committee
for the Design of the BRIN/INBRE Evaluation

September 7-8, 2005

NCRR Conference Room, 9th Floor
One Democracy Plaza
Bethesda, MD

Wednesday, September 7

Breakfast (on your own)

9:00 a.m.	Welcome and Introductions Review of the Agenda and Materials	Mary Look
9:15 a.m.	Perspectives from NCRR <ul style="list-style-type: none">• NCRR Priorities• Background on the IDeA Initiative/ Overview of the INBRE Program• Charge to the External Advisory Committee	Barbara Alving Fred Taylor Patricia Newman
10:15 a.m.	Characteristics of INBRE Networks and States	Mary Look
10:45 a.m.	Break	
11:00 a.m.	Proposed Study Design for the INBRE Evaluation <ul style="list-style-type: none">• Conceptual Framework• Study Questions• Data Collection Strategies• Data Analyses	Marcia Carlyn
11:30 a.m.	Discussion of the 10 Study Questions	Committee Members
12:15 p.m.	Lunch <ul style="list-style-type: none">• Which Baseline Characteristics and Program Activities Are Most Likely to Predict Success? (Study Questions 2 – 4)	Committee Members
1:30 p.m.	Challenge of Collecting Qualitative Data	Marcia Carlyn
2:15 p.m.	Review of Data Collection Forms and Pilot Test Results	Susan Akin
2:45 p.m.	Discussion of Data Collection Forms <ul style="list-style-type: none">• Network Snapshot at End of Year 1• Network Overview Form• Institution Form• Project Leader Form	Committee Members

**Meeting of the Advisory Committee
for the Design of the BRIN/INBRE Evaluation**

Wednesday, September 7 (continued)

3:30 p.m.	Break	
3:45 p.m.	Different Types of Data Analyses	Mary Look/Marcia Carlyn
4:15 p.m.	Discussion of the Proposed Data Collection Strategies and Data Analyses	Committee Members
5:15 p.m.	Return to Hotel	
6:30 p.m.	Dinner at Hotel Restaurant (optional)	

Thursday, September 8

Breakfast (on your own)

9:00 a.m.	Discussion of Ways to Improve the Study Design <ul style="list-style-type: none">• Conceptual Framework• Study Questions• Data Collection Strategies• Data Analyses	Committee Members
10:30 a.m.	Review of Expense Reporting by Committee Members	Jamie Haig
10:35 a.m.	Break	
10:45 a.m.	Recommendations of Committee Members (Summarized on Response Sheets)	Committee Members
11:30 a.m.	Concluding Remarks	Patricia Newman
11:45 a.m.	Adjournment	

EXHIBIT 8

DISCUSSION GUIDE FOR SITE VISITS

EVALUATION OF THE INBRE PROGRAM

DISCUSSION GUIDE

INTRODUCTION

Thank you for agreeing to talk with us today. I'm _____, a(n) _____ working with ORC Macro to design an evaluation of the INBRE Program. ORC Macro is the independent contractor that was selected by the National Center for Research Resources to conduct this early phase of the evaluation. Dr. Susan Akin is a senior research associate [Dr. June Bray is technical director; Dr. Mary Look is senior vice president; Dr. Marcia Carlyn is a senior evaluation consultant with] at ORC Macro, and Patricia Newman is here as a representative of NCRR. [Patty will explain her role with respect to the project.]

The current design phase is a feasibility study. Its purpose is twofold:

1. to determine the best way to measure the achievement of desired outcomes; and
2. to identify key factors likely to influence the success of different INBRE programs.

Four INBRE networks (including yours) were selected for site visits and another nine networks will pilot-test the data collection forms that emerge from the site visits. Your site and the others were selected based on a set of criteria designed to ensure that the feasibility study includes programs with different approaches located in different areas of the country. We will also be meeting with an expert panel this summer to discuss their recommendations on the proposed design. The broad evaluation is planned for FY 2007 and will focus on all 24 INBRE networks that were initially funded in FY 2001-2002.¹

We feel that the best way for us to really understand what has occurred in different settings is to ask you and other participants to share your experience with us, including your personal views on why some approaches have worked better than others in your state. NIH is especially interested in your views on how collaborations can be forged between researchers at doctoral institutions and faculty at 2-year and 4-year colleges. The final report for the feasibility study (which will be completed in October) will summarize our findings, including recommendations on the best way for NCRR to evaluate program success after 4-5 years of INBRE support. We are very pleased that you agreed to participate in this study.

Before we begin, I'd like to review a few important points about the project.

- First, this is a collaborative study. In addition to working with the expert panel, we hope to learn a great deal from you and other members of your team – and we hope the discussions will be helpful to you also.

¹ The proposed study design was subsequently modified to include 23 networks, and to refer to the program as BRIN/INBRE where appropriate.

- We realize that you took on a very challenging task when you first started your INBRE program. Creating a strong statewide network requires individuals who know good science as well as individuals who know how to manage people and facilities, who know how to do strategic planning, and who know how to make things happen. Unlike most NIH site visits, we will be focusing less on the science itself and more on these “intangibles.” Through group discussions and one-on-one discussions, we hope you will share with us the most important things you have learned over the last several years.
- Please be assured that specific information collected in discussions such as this will be kept confidential. We would like you to be as open as possible about the difficulties in implementing a program of this magnitude. We will take careful precautions to ensure that your names cannot be associated with your responses.

Do you have any questions at this time? If you have no further questions, why don't we begin the discussion. Again, let me confirm that you have until _____ [time] before we must conclude the discussion. Is that correct?

GENERAL DISCUSSION QUESTIONS

[Given the variety of individuals who will be participating in discussions, a relatively unstructured format will be used. The following questions are quite general and open-ended in order to obtain the respondent's overall impression of the INBRE program in this state. The discussion leader will select the most appropriate questions for each respondent or group of respondents. Probes will be used to understand the respondent's perception of specific factors, with particular attention paid to how the different network activities recommended by NCRR are being implemented (enhancing research facilities, bioinformatics, faculty recruitment, research training, mentoring, research support, outreach, management/communication systems, and strategic planning/evaluation). If the respondent states that certain activities have been especially important to success, he/she will be asked to describe strategies that have proven to be effective and any lessons they have learned in this area.]

Am I correct that you have been involved in the INBRE program since Year 1 (when it was called BRIN)? How would you describe your primary role with regard to the program?

Creating a statewide network of research excellence is not an easy task. Overall, how big a challenge do you think it has been for your state?

Is there an over-arching *vision* for your program – a long-term goal that your INBRE team is hoping to achieve? [Probe for a specific research agenda.] How do you know you are making progress toward achieving this long-term goal? What types of ongoing planning activities have been the most effective? Has your Steering Committee established any milestones to help you assess your progress? Has your EAC been helpful? In what ways? [STPLAN]

A key aspect of the project is the relationship between the INBRE participants, the academic departments that are involved at each institution, and senior administrators. Overall, how do you think these *partnership relationships* have been working within your institution? Who has primary control over the number of permanent faculty and research positions? Have any new policies been adopted that encourage research productivity or make it easier to recruit high-quality researchers at all levels? [Probe for specific policies and incentives, such as additional release time, startup funds, lab personnel, a portion of indirect costs from grants being distributed to research departments, etc.] How do you think your partnerships with the other institutions in your network have been working? Has it been logistically difficult to get together? What types of *outreach* activities have been conducted? How have you kept track of the research interests and skills of INBRE participants at the different institutions? [OUTRCH, MGT]

Recruiting research faculty can be challenging, especially in IDeA states like _____. How successful have you been in recruiting junior and senior investigators? Have some strategies been more effective than others in identifying, recruiting, and selecting faculty in different disciplines? [RECRUIT]

Your institution has clearly improved its *research facilities* and equipment with NCRR funds. How would you rate your *bioinformatics* capability today compared to 3-4 years ago? What has been the biggest challenge with respect to research facilities and bioinformatics? [FACIL, BIOINF]

In addition to developing these shared facilities, have certain *research support services* been especially helpful to INBRE investigators? [Probe for specific support services: proposal development, internal peer reviews, biostatistical support, bibliographic searches, grants management, computer services, etc.] Have junior investigators been given adequate release time to move forward with their research? [RSUPP]

In what ways are all the research faculty in the INBRE departments different now than they were a few years ago? In your opinion, have their research skills improved? Have their grant-writing skills improved? What specific *training activities* have been most effective in improving the research skills of faculty and students? [Probe for training opportunities: grantsmanship workshops, seminars, symposia, journal clubs, visiting scientist programs, etc.] What types of new courses or academic programs been initiated at some of your INBRE institutions? What challenges did you experience in developing new curricula? [TRNG]

What have you learned about *mentoring* junior faculty and students who are at different stages in the pipeline? In your opinion, what makes a good mentor? Should there be certain requirements of all mentors? [MENTOR]

Managing the day-to-day needs of INBRE participants is especially important, but it is often hard to achieve a smooth-running and efficient organization. How would you describe the management of your network? Are resources allocated fairly? Is the paperwork excessive? Are potential conflicts resolved fairly quickly? If you were in a position to change the way things are done, what would you do differently?
[MGTCOMM]

It is quite challenging for complex organizations, such as yours, to develop good *communication systems* – so people working in different roles can quickly get the information they need to do their jobs effectively. From your perspective, how effective are the communication systems within your network? [Probe with respect to different forms of communication ... written/verbal, phone/fax/email/Internet, video conferencing]. [MGTCOMM]

Of the things we have been talking about so far, what one or two things would you say are absolutely important in making this type of program successful?

Conversely, what things are the most *challenging* in making this type of program work?

ADDITIONAL DISCUSSION ISSUES

[At this point in the discussion, the discussion leader will ask questions about specific factors in the study's conceptual framework that have not yet been discussed or items on the data collection that were identified by the research team as being unclear or problematic for this site. The general flow of questions will begin with asking the respondent to expand on his/her perception of the scientific and administrative leadership, strategic planning processes, and/or the management and communication systems – then move on to specific activities that have been implemented. If the respondent states that certain characteristics or activities are important to success, he/she will be asked to describe any lessons learned in this area and strategies that have proven to be effective.]

CONCLUSION

We are nearing the time to conclude the interview. I want to thank you very much for the helpful information (and insights) you have given. I hope our discussion has been enjoyable for you also.

EXHIBIT 9

DATA COLLECTION FORM: NETWORK SNAPSHOT AT END OF YEAR 1

EVALUATION OF THE BRIN/INBRE PROGRAM

[State Abbreviation]	[Current Name of BRIN/INBRE Network]	Form Completed by:
		Date Completed:

Grant Number	
Project Start Date	

Administrative Core - End of Year 1	Individual's Name	Institution	Department
Principal Investigator (PI)			
Program Coordinator			
Associate Program Director			
Administrative Coordinator			
Evaluation Coordinator			

Primary Research Themes

Other Research Themes

Participating Institutions - End of Year 1	Instit Abbrev	Highest Science Degree	Steering Comm Rep	Department
[One line for each institution that was represented on the Steering Committee at the end of Year 1]				

Cores / Committees - End of Year 1	Director/ Chair	Institution	Department	# Faculty/Staff Assigned
[One line for each core, committee, and subcommittee, with the lead institution(s) identified with an asterisk *.]				

* Lead institution

¹ See Instructions for Completing Data Collection Forms.

EXHIBIT 10

DATA COLLECTION FORM: NETWORK OVERVIEW YEARS 1–5

EVALUATION OF THE BRIN/INBRE PROGRAM

NETWORK OVERVIEW FORM(TO BE COMPLETED BY THE LEAD INSTITUTIONS¹)

					Form Completed by: _____	
					Date Completed: _____	
Month/Year of BRIN/INBRE Award →		Year 1	Year 2	Year 3	Year 4	Year 5
1	Lead institution(s) ¹					
2	Partner institutions ¹ (each must be represented on the Steering Committee)					
3	Total # SPIDs (subproject IDs) ¹					
	# research SPIDs, including pilot research projects					
	# non-research SPIDs (cores)					
4	Names of BRIN/INBRE committees and subcommittees (including EAC) ¹					
5	How many EAC meetings were held each year? (Indicate the location of each meeting or if it was a conference call.)					
6	How many Steering Committee meetings were held each year? (Indicate the location of each meeting and if some members participated by conference call.)					
		Years 1 - 5				
7	Did your BRIN/INBRE network change the way it assigned SPIDs during the first 5 years? (If so, please explain why.)					
8	Did your BRIN/INBRE network change its major budget allocations during the first 5 years? (If so, please explain why.)					

EVALUATION OF THE BRIN/INBRE PROGRAM

NETWORK OVERVIEW FORM(TO BE COMPLETED BY THE LEAD INSTITUTIONS¹)

		Years 1 - 5
9	Looking back over the first 5 years of BRIN/INBRE, which of the strategies employed by your network seemed to work the best? (Please explain.)	
10	Which strategies did not work very well? (Please explain any lessons learned during the first 4 years.)	
11	Were there any unexpected events (either positive or negative) over which the network had no control? (If yes, please explain.)	
¹ See Instructions for Completing Data Collection Forms.		

EXHIBIT 11

DATA COLLECTION FORM: INSTITUTION FORM YEARS 1–5

EVALUATION OF THE BRIN/INBRE PROGRAM

INSTITUTION FORM(TO BE COMPLETED BY EACH BRIN/INBRE INSTITUTION¹)

Month/Year of BRIN/INBRE Award →		Year 1	Year 2	Year 3	Form Completed by:	
					Date Completed:	
		Year 1	Year 2	Year 3	Year 4	Year 5
1	Institution's name					
2	What was the highest science or health-related degree offered by your institution (doctoral, master's, bachelor's, associate's degree)?					
3	Which departments were actively involved in the BRIN/INBRE program?					
4	Who represented your institution on the BRIN/INBRE Steering Committee? (Please list individual's name and department.)					
5	How many Steering Committee meetings did your representative attend each year? (Indicate the location of each meeting or if your representative participated by conference call.)					
6	Were any other meetings or retreats held to develop an evaluation plan, establish milestones, or assess the progress of your institution? (If yes, please explain.)					
7	How many times each year was your institution visited by BRIN/INBRE participants from the lead institution(s)? Who visited each year?					
8	Were any new full-time faculty positions or permanent research positions established in BRIN/INBRE departments? (If yes, list each new position and its department.)					
9	Did any of your faculty members serve as BRIN/INBRE mentors during the academic year and/or summer? (If yes, list each person's name and department.)					
10	Were any junior or senior investigators recruited into BRIN/INBRE departments from outside the institution? (If yes, list each person's name and department.)					

EVALUATION OF THE BRIN/INBRE PROGRAM

INSTITUTION FORM(TO BE COMPLETED BY EACH BRIN/INBRE INSTITUTION¹)

		Year 1	Year 2	Year 3	Year 4	Year 5
11	Were any new research facilities or major upgrades made available to your faculty and students as a result of BRIN/INBRE? (If yes, list new facilities, institutional location, and who benefited.)					
12	Were any new science courses or other research training opportunities offered at your institution as a result of BRIN/INBRE (e.g., workshops on lab techniques, grantsmanship, or scientific writing, summer programs, conferences, journal clubs, distance learning, new majors or minors)? (If yes, please explain.)					
13	Were any new research support services made available to your faculty and/or students as a result of BRIN/INBRE (e.g., release time, lab personnel, assistance with grant writing, presentations, publications, bioinformatics, data management, accessing library resources)?					
14	How many students participated in BRIN/INBRE activities each year? (List number of undergraduates, graduate students, and postdocs who participated each year.)					
15	In each year, how many undergraduate students who participated in BRIN/INBRE were accepted into a graduate program involving biomedical research (including medical school, dental school, nursing program, etc.)? [For community and tribal colleges, how many students transferred to a baccalaureate institution to pursue a science or health-related degree?]					

EVALUATION OF THE BRIN/INBRE PROGRAM

INSTITUTION FORM(TO BE COMPLETED BY EACH BRIN/INBRE INSTITUTION¹)

		Years 1 - 5
16	<p>Looking back over the first 5 years of BRIN/INBRE, which of the following activities did your institution focus on the most? (Please explain why and also explain if your priorities changed through time.)</p> <p> <input type="checkbox"/> Upgrading research facilities <input type="checkbox"/> Improving bioinformatics capability <input type="checkbox"/> Recruiting additional faculty <input type="checkbox"/> Offering new courses and research training <input type="checkbox"/> Mentoring junior faculty and students <input type="checkbox"/> Providing adequate research support (release time) <input type="checkbox"/> Addressing needs of partner institutions <input type="checkbox"/> Ensuring effective management/ communications <input type="checkbox"/> Assessing needs, setting goals, tracking progress </p>	
17	<p>To what extent did the BRIN/INBRE program enhance your institution's ability to recruit and retain good faculty? Did you lose any faculty? If so, did you have any problems filling their positions? (Please explain.)</p>	
18	<p>Did your institution revise its appointment/promotion policies or any other policies to encourage faculty and students to conduct high-quality research? (If yes, please explain.)</p>	
19	<p>Were any new collaborative research projects or teaching projects established between BRIN/INBRE participants at your institution and another BRIN/INBRE institution or other organization? (If yes, list organizations and briefly describe each project.)</p>	
20	<p>Were your institution's BRIN/INBRE funds leveraged to increase research funding/support from other sources? (If yes, please explain and estimate total additional dollars obtained by leveraging.)</p>	

EVALUATION OF THE BRIN/INBRE PROGRAM

INSTITUTION FORM(TO BE COMPLETED BY EACH BRIN/INBRE INSTITUTION¹)


		Years 1 - 5
21	Looking back over the first 5 years of BRIN/INBRE, which of the strategies employed by your institution seemed to work the best? (Please explain.)	
22	Which strategies did not work very well? (Please explain any lessons learned during the first 4 years.)	
23	Overall, does your institution consider itself to be a true partner in the statewide BRIN/INBRE network? Have your institution's needs been adequately addressed? (Please explain.)	
24	Before FY 2001, had your institution collaborated with any of the other institutions in the network on non-BRIN projects (e.g., seminars, workshops, courses, recruitment efforts, grants, other research projects)? If yes, please explain.	
25	Were there any unexpected events (either positive or negative) over which your institution had no control? (If yes, please explain.)	
¹ See Instructions for Completing Data Collection Forms.		

EXHIBIT 12

DATA COLLECTION FORM: PROJECT LEADER FORM YEARS 1–5

EVALUATION OF THE BRIN/INBRE PROGRAM

PROJECT LEADER FORM(TO BE COMPLETED BY EACH BRIN/INBRE PROJECT LEADER¹)

		Form Completed by: _____
		Date Completed: _____
		
1	Academic rank (when investigator joined BRIN/INBRE)	
NAME OF PROJECT LEADER		
2	Institution	
3	Department	
4	Postdoctoral institutions and year postdoctoral work was completed (if applicable)	
5	Previous research grants (if any) on which you served as the PI (For each grant, list funding source and grant number or title before joining BRIN/INBRE.)	
6	BRIN/INBRE project title and SPID number (if applicable) ²	
7	BRIN/INBRE mentors (List name of each person who provided one-on-one mentoring.)	
8	Which research training activities have been most helpful to you (e.g., specific courses, workshops, seminars, conferences, journal clubs, etc.)?	
9	Have you reported on your research progress to groups of other researchers? (If yes, which groups and how often?)	
10	Are you still at the institution? (If no, list last BRIN/INBRE year and new institution.)	
11	Are you still working in the state? (If no, list last BRIN/INBRE year and new state.)	
¹ See Instructions for Completing Data Collection Forms.		
² SPID = subproject ID number assigned to this research project.		

EVALUATION OF THE BRIN/INBRE PROGRAM

PROJECT LEADER FORM(TO BE COMPLETED BY EACH BRIN/INBRE PROJECT LEADER¹)

Month/Year Investigator Joined Program →		Year 1		Year 2		Year 3		Year 4		Year 5	
		Academic Year	Summer months	Academic Year	Summer months	Academic Year	Summer months	Academic Year	Summer months	Academic Year	Summer months
12	Percent effort spent on research and related activities										
	Percent effort spent on teaching and related activities										
	Percent effort spent on administrative, clinical, service, and other activities										
13	How many weeks per year did you work in a mentor's or collaborator's lab?										
14	When not in your mentor's lab, how many times per month did you usually communicate with a mentor?										
15	How many lab personnel worked in your lab each year? (List # postdocs, lab techs, grad students, undergrads.)										
16	# abstracts published each year (include co-authorship)										
17	# peer-reviewed papers, books, or chapters published each year (include co-authorship)										
18	Grant applications in which you served as PI or co-PI (List funding source, grant application number, and PI's name for each new or amended grant application.)										
19	Grant awards in which you served as PI or co-PI (List funding source, grant number, and PI's name.)										

EVALUATION OF THE BRIN/INBRE PROGRAM

PROJECT LEADER FORM(TO BE COMPLETED BY EACH BRIN/INBRE PROJECT LEADER¹)

		Years 1 - 5
20	Looking back on your BRIN/INBRE experience, what types of research support were most helpful to you (e.g., bioinformatics, data management, proposal development, on-line access to library resources, presentation/publication support)?	
21	<p>Which of the following were emphasized the most at your institution? (Please explain which strategies were most helpful to you and whether you would have appreciated more help in certain areas.)</p> <p> <input type="checkbox"/> Being given specific milestones to achieve <input type="checkbox"/> Having rehearsals before EAC meetings <input type="checkbox"/> Being debriefed after EAC meetings <input type="checkbox"/> Having an efficient system for hiring lab personnel <input type="checkbox"/> Having an efficient system for purchasing lab supplies <input type="checkbox"/> Being encouraged to read successful grant proposals <input type="checkbox"/> Getting useful feedback on your own grant proposals <input type="checkbox"/> Getting useful feedback on your draft manuscripts <input type="checkbox"/> Being encouraged to join a professional society <input type="checkbox"/> Getting advice on potential collaborators <input type="checkbox"/> Getting advice on career decisions </p>	
22	What other strategies employed by your BRIN/INBRE mentor or the overall program were helpful to you? (Please explain.)	

EXHIBIT 13

INSTRUCTIONS FOR COMPLETING DATA COLLECTION FORMS

EVALUATION OF THE BRIN/INBRE PROGRAM

INSTRUCTIONS FOR COMPLETING DATA COLLECTION FORMS

As part of the evaluation of the BRIN/INBRE program, information on each BRIN/INBRE network was gathered from Annual Progress Reports (APRs), other program documents, and web sites. Key information was then summarized using 4 types of data collection forms:

- Network Snapshot at End of Year 1
- Network Overview Form
- Institution Form
- Project Leader Form

We need your help at this time to complete an on-line survey involving one or two of the data collection forms. Although participation in the survey is voluntary, we would truly appreciate your cooperation.

Using the PIN and password given to you in the cover letter, you may begin the survey. Please review the information, correct any errors, and fill in missing data. Use the following coding terms if they are needed:

DNA Data not available
QNA Question not applicable

Blank answers will be interpreted as 0 (or none).

Definitions and examples of terms used in the survey are presented below. If you have any questions about completing the survey, please contact _____ by e-mail or by phone [e-mail and phone]. If you have any questions about the overall data collection process, you may contact _____ at _____ [e-mail and phone] or _____ at NCRR [e-mail and phone].

After you have completed the survey, please click “Submit” to send it directly to the evaluation team by no later than _____. Your responses will be kept confidential and will not be shared with other network participants or NCRR program staff. We very much appreciate your cooperation.

Lead institutions. The organizations that have primary responsibility for the BRIN/INBRE network (i.e., the institution of the principal investigator and any other research institute or doctoral-granting organization that has been designated as a lead institution for the BRIN/INBRE network).

Partner institutions. The other organizations in the network that are actively involved in BRIN/INBRE activities and are represented on the Steering Committee.

BRIN/INBRE departments: The academic departments in the lead and partner institutions that have one or more faculty members who are active participants in the BRIN/INBRE network.

BRIN/INBRE committees. Committees and permanent subcommittees involving BRIN/INBRE participants that meet fairly regularly in person or via teleconference to help achieve BRIN/INBRE goals. Examples include the External Advisory Committee (EAC) and Steering Committee.

BRIN/INBRE participants. Individuals who contributed in a substantive way to the scientific development or administration of the BRIN/INBRE network, including external collaborators and those who did not receive any salary or other direct support from the grant. BRIN/INBRE participants are listed in the Personnel Roster included in each year's APR.

SPID number. The unique subproject identification number assigned to a particular BRIN/INBRE research subproject or non-research core (e.g., Administrative Core, Bioinformatics Core, Training and Mentoring Core, Science Research Core, Centralized Research Core Facility).

Senior investigator: An individual with a permanent faculty or research appointment at a lead institution or partner institution who is an established investigator in a biomedical research field with experience obtaining major research grants from NIH and/or other funding sources. Include members of the BRIN/INBRE Steering Committee who meet this definition.

Junior investigator: An individual with a permanent faculty or research appointment at a lead institution or partner institution who has never been awarded a major research grant from NIH or another funding source.

BRIN/INBRE project leader. An individual (a junior investigator in most cases) serving as the lead investigator for a BRIN/INBRE research project (which may be a pilot research project), with assistance provided by one or more BRIN/INBRE mentors. Each project leader should have a tenure track or permanent faculty or research appointment and should never have served as the principal investigator of a major NIH research grant (e.g., R01, R33, R35, R37, R42, R44, P01, P42, U01, U19, U44). The project leader may have several years of research experience and may have served as the PI of a non-NIH grant or an NIH starter grant or exploratory grant (e.g., R03, R15, R21, R29, R34, R41, R43, U43). Under certain circumstances, an established investigator making a significant change in his/her research field may qualify as a project leader.

BRIN/INBRE mentor: A BRIN/INBRE participant (including an EAC member) who is responsible for providing substantial one-on-one assistance to a BRIN/INBRE project leader to improve his/her knowledge and expertise in a particular scientific area, grantsmanship capabilities, and/or other research-related skills. Mentors also provide assistance in career development.

Research support services (examples):

- Bioinformatics support
- Biostatistical and data management support
- Grants and contracts management support
- On-line access to library resources
- Proposal development support
- Presentation and publication support
- Information technology (IT) support

Research training opportunities (examples):

- New science courses
- New science majors or minors
- Scientific writing workshops
- Training workshops for research facilities and equipment
- On-site and distance learning courses on research techniques
- Summer institutes
- Grantsmanship workshops
- Research conferences
- Seminar series
- Visiting scientist programs
- Journal clubs
- Symposia

EXHIBIT 14

**COVER LETTER TO PRINCIPAL INVESTIGATORS PARTICIPATING IN PILOT TEST
OF DATA COLLECTION FORMS**

June 2005

<<Name>>
<<Address Line 1>>
<<Address Line 2>>
<<Address Line 3>>

Dear <<NAME>>:

A feasibility study is currently being sponsored by the National Center for Research Resources (NCRR) to determine the best design for a future evaluation of the BRIN/INBRE Program. ORC Macro (a research firm in Bethesda, MD) was given the responsibility to conduct the feasibility study. We are assessing different ways to measure the achievement of desired outcomes and key factors likely to influence the success of different BRIN/INBRE networks.

Your program has been selected to participate in the study's data collection pilot tests. Nine pilot sites were selected based on a variety of factors to ensure that we obtain information from programs having different characteristics. The data collection forms have been designed to collect key information on each network without placing an excessive burden on site personnel.

As one of the selected pilot sites, please review the attached documents:

- Instructions for Completing the Data Collection Forms
- Network Snapshot at End of Year 1
- Network Overview Form
- Institution Form
- Project Leader Form

The first document is a Microsoft (MS) Word document and the others are MS Excel worksheets. The **Network Snapshot** and the **Network Overview Form** involve your overall BRIN/INBRE network and should be completed by you or other members of your Administrative Core. Some of the data items in these worksheets have been filled in based on your initial implementation plan and Annual Progress Report (APR), but some of the information may not be accurate. Please correct any errors and fill in the missing data, including the box at the top of each form indicating who completed the form and the date it was completed. Enter your data directly on the spreadsheets, expanding the cells if needed, and then return the completed spreadsheets via e-mail to Jane Manahan at jmanahan@qrc.com.

One **Institution Form** should be completed for each organization affiliated with your network (including the lead institution). We suggest that you forward a copy of the Institution Form along with the instructions to a senior administrator at each organization (in most cases, this would be the person who serves on the BRIN/INBRE Steering Committee). After the form has been completed, it should be returned via e-mail to jmanahan@qrc.com.

One **Project Leader Form** should be completed for each investigator who is (or was) leading a BRIN/INBRE project (e.g., a major project that was given a SPID number under your grant). We suggest that you forward a copy of the Project Leader Form along with the instructions to each of these investigators. After the form has been completed, it should be returned via e-mail to jmanahan@qrc.com.

We need to receive all of the forms by no later than **Friday, June 24, 2005**. If you have any questions about the forms or the study itself, please feel free to contact me at (301) 657-3070 ext. 115 or mlook@qrc.com. You may also contact Jane Manahan, the research analyst for the project at (301) 657-3070 ext. 305 or jmanahan@qrc.com.

All the information you provide will be kept confidential and will be used only for the purposes of the feasibility study. The study is being conducted under the auspices of the NCRR Office of Science Policy and Public Liaison (OSPPL), and the data collected about each program and its participants will not be available to the BRIN/INBRE program office. If you have any questions regarding the data collection pilot tests, please contact Patricia Newman, OSPPL program analyst at (301) 435-0866 or pnewman@mail.nih.gov.

In addition to sending us your completed forms, we encourage you to include comments about the draft data collection instruments and the response burden you experienced in completing the forms. In piloting the forms, you will be playing an important role in the success of the feasibility study. We very much appreciate your cooperation.

Sincerely,

[Insert signature]

Mary V. Look, Ph.D.
Senior Vice President

APPENDIX A

PROPOSAL FOR NIH EVALUATION SET-ASIDE FUNDING

EVALUATION OF THE BRIN/INBRE PROGRAM
PROPOSAL FOR NATIONAL INSTITUTES OF HEALTH
EVALUATION SET-ASIDE FUNDING

Introduction

The National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH), established the Biomedical Research Infrastructure Network (BRIN) program in fiscal year (FY) 2001. BRIN is part of the Institutional Development Award (IDeA) initiative that was legislatively mandated in 1993 to enhance the research competitiveness of states (including Puerto Rico) that have had “historically low aggregate success rates” in obtaining NIH grant awards.¹ After three years of funding, the BRIN program was expanded, renamed the IDeA Networks of Biomedical Research Excellence (INBRE) program, and recompeted to offer IDeA states five more years of support to further strengthen their biomedical research infrastructure.

NCRR is seeking NIH Evaluation Set-Aside funds to conduct an outcome evaluation of the first five years of the BRIN/INBRE program (FY 2002–2006). The following proposal for the full-scale evaluation incorporates the results of a phase 1 feasibility study that was sponsored by NCRR to determine the optimal design for a phase 2 evaluation. The feasibility study was conducted in FY 2005 by an independent contractor; the final design includes the recommendations of a seven-member external advisory committee comprising distinguished researchers and administrators from IDeA and non-IDeA states as well as an economist.

A major component of the feasibility study was the development of a conceptual framework illustrating how the BRIN/INBRE program is intended to work (see Exhibit 1). In addition to the conceptual framework, the feasibility study produced the following products:

- A set of 10 study questions to be answered as part of the outcome evaluation
- An operational definition for each key variable identified in the conceptual framework
- Recommended data sources for obtaining information on each of the key variables, which included a broad range of primary and secondary data sources
- Recommended data collection and data analysis strategies to be used in answering the study questions, which were based on the results of several pilot studies. Specifically, site visits were conducted with four BRIN/INBRE networks, and pilot tests were conducted with eight additional networks to develop data collection forms that would not be overly burdensome to

¹ Eligibility for the IDeA initiative was initially limited to states participating in the National Science Foundation Experimental Program to Stimulate Competitive Research and states that had received less than \$30 million in NIH grant funding in FY 1992. In subsequent years, the eligibility criteria were revised to include states that had experienced a relatively poor success rate over several years in competing for NIH grants (states that had a success rate of less than 20 percent in competing for NIH grants or had received less than \$100 million on average in NIH support from 1999 to 2003). When BRIN was initiated in FY 2001, the following 23 states and Puerto Rico (hereafter referred to as 24 states) were eligible for BRIN funding: Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming. The same 24 states were later eligible for INBRE funding.

site staff. The final products included a set of four data collection forms summarizing basic information about each BRIN/INBRE network, a discussion guide for use during site visits and telephone interviews, and coding procedures (including scoring sheets) to be used in summarizing each participant's responses.

Additional information regarding each of these products is provided in the present proposal and a final report delivered to NCRR. The proposal was written in the format recommended by the *NIH Program Evaluation Guide: How to Develop a Proposal for Evaluation Set-Aside Funding*.

Section 1: Program To Be Evaluated

Program description. The program to be evaluated is the BRIN/INBRE program, which is a major component of NCRR's IDeA initiative. The IDeA program was legislatively mandated by the NIH Revitalization Act of 1993, and NCRR was given responsibility for establishing and implementing the new program. As authorized by Congress, the primary intent of the IDeA program is to broaden the geographic distribution of NIH research funds by enhancing the research competitiveness of institutions located in states with "historically low aggregate success rates" in obtaining NIH grant awards. The long-term goals of the IDeA program are twofold: 1) to strengthen the infrastructure of institutions within states that traditionally have not received significant levels of NIH competitive funding and 2) to enhance the research competitiveness of investigators and institutions in IDeA-eligible states. To achieve these goals, NCRR provides IDeA funding for laboratory and instrumentation modernization, recruitment of promising young investigators and established investigators who can serve as mentors, and research activities designed to stimulate sustainable improvement in biomedical research capacity. Funding for the IDeA program grew steadily from \$750,000 in FY 1993 to \$10 million in FY 1999, but that funding was not sufficient for NCRR to develop major initiatives.

In FY 2000, an increase in congressional funding to \$38.5 million permitted NCRR to expand the IDeA program and develop a more comprehensive initiative, Centers of Biomedical Research Excellence (COBRE), for the purpose of creating multidisciplinary biomedical or health research centers within universities, medical schools, and other doctorate-granting institutions in IDeA states. Congress authorized additional funding in FY 2001 (approximately \$45 million) to encourage IDeA states to establish statewide BRINs to promote the development and sharing of research resources and expertise throughout each IDeA state through collaborative partnerships among the participating institutions. An important aim of the BRIN program was to strengthen the basic science departments of undergraduate institutions in the state (including community and tribal colleges) in order to expand the "pipeline" of students pursuing science and health-related careers. By the end of FY 2002, all 24 IDeA states had received three-year BRIN awards. In FY 2004, the BRIN program (funded through the P20 grant mechanism) was expanded and renamed INBRE. The INBRE program was also funded through the P20 grant mechanism, and 23 of the 24 IDeA states competed successfully for INBRE awards. The INBRE program offered IDeA states five more years of support to augment and strengthen their biomedical research capacity by developing a statewide multidisciplinary research network, expanding and strengthening the research capabilities of their biomedical faculty, and providing undergraduate and graduate students access to biomedical research resources.

Each BRIN/INBRE network was required to have an Administrative Core, a Bioinformatics Core, at least one other core, and an evaluation component. BRIN/INBRE awardees were also required to establish a steering committee for the network (consisting of the principal investigator (PI) and representatives from the participating institutions) and an external advisory committee (EAC) to provide scientific and administrative oversight. The BRIN/INBRE awards were substantial, providing each network with up to \$2 million per year. Evidence of strong institutional commitment was required for both BRIN and INBRE, although there was no matching funds requirement.

Program goals. The primary purpose of the BRIN/INBRE program is to enhance the overall research capacity of the participating states and institutions. The outcome evaluation is designed to focus on the extent to which the networks made progress during their first five years in achieving nine short-term and six long-term goals. It is expected that by the end of Year 5, substantial progress will have been made in achieving the following short-term goals:

- Improved research facilities and support services, including bioinformatics
- Successful recruitment of junior and senior investigators from different disciplines
- Increased collaboration among researchers and institutions
- More students majoring in science and health-related fields
- More students and faculty participating in research activities
- More science faculty and permanent research positions
- More scientific publications and presentations
- More applications for NIH research grants
- More undergraduate students pursuing science and health-related careers

It is also expected that the networks will have made progress by the end of Year 5 in achieving the following long-term goals, although some may not be fully achieved until Year 15:

- Development of a statewide multidisciplinary research network
- More science courses and programs offered
- More undergraduate and graduate degrees awarded in science and health-related fields
- Increased success competing for NIH research grants
- Increased state and institutional commitment to research
- Increase in the proportion of total NIH funding received by the state

All of the study questions to be answered in the full-scale evaluation involve one or more of these program goals.

Section 2: Need for an Evaluation

Type of evaluation. The proposed study is an outcome evaluation, designed to assess the extent to which the BRIN/INBRE program has achieved its short-term and long-term goals.

Purpose of the evaluation. The primary purpose of the outcome evaluation is to determine the extent to which the 23 BRIN/INBRE networks that were funded during the program's first five years achieved specific short-term and long-term goals during this period (FY 2001–2006). A secondary purpose is to provide additional insight on why some of the networks achieved greater

success than others in enhancing their research capacity. Ten study questions will be answered, which are presented in section 3. As mentioned in the Introduction, a feasibility study was conducted to determine the optimal design for the full-scale outcome evaluation.

Use of results. The results of the outcome evaluation will be used by NCRR administrators to address congressional inquiries regarding the impact of the BRIN/INBRE program, complete a major component of Goal 8d of the Government Performance and Results Act (GPRA), identify the most relevant measures for tracking the future progress of the networks, develop strategies to enhance the program's effectiveness, and improve program management. The results of the evaluation are also expected to influence the requirements of any subsequent requests for applications (RFAs) involving the BRIN/INBRE networks. BRIN/INBRE awardees will be able to use the evaluation results to compare their network's performance with that of other networks, learn about best practices implemented by the most successful networks, and improve the management of their networks. In addition, it is anticipated that the methodology and results of the BRIN/INBRE evaluation will be useful to administrators in other NIH Institutes and Centers as well as other Government agencies and organizations that are interested in evaluating the success of programs designed to enhance the research capacity of states and institutions and develop centers of excellence in multidisciplinary biomedical research.

Review of related studies. The feasibility study included a review of three major evaluation studies of NIH programs aimed at strengthening the biomedical research capacity of institutions (research infrastructure) and studies that investigated the challenges of enhancing collaborative interdisciplinary research:

- *Feasibility Study for the COBRE Program Evaluation (Tasks 1 and 2)*, sponsored by NCRR, 2005
- *Feasibility Study to Evaluate Minority Institution Research Development Programs*, sponsored by the National Institute of Neurological Disorders and Stroke and National Institute on Alcohol Abuse and Alcoholism, 2000
- *Evaluation of the Research Centers in Minority Institutions (RCMI) Program*, sponsored by NCRR, 2000
- *Facilitating Interdisciplinary Research*, published by the National Academy of Sciences, 2005
- *Characteristics of Research Centers and Institutes at U.S. Medical Schools and Universities*, by William T. Mallon and Sarah A. Bunton, published by the Association of American Medical Colleges (AAMC), 2005

In addition to reviewing the findings, the evaluation team that conducted the phase 1 BRIN/INBRE feasibility study reviewed the conceptual frameworks, study questions, data collection instruments, and data analyses used in these evaluation studies.

Timeliness of the evaluation. Strong congressional interest in the IDeA program, along with significant increases in funding, have led to urgent questions about whether the biomedical research capabilities and competitiveness of IDeA states, institutions, and centers have been enhanced as a result of the major IDeA initiatives. Although the proposed full-scale evaluation is an early assessment of the BRIN/INBRE program, enough time has elapsed for the networks initially funded in FY 2001–2002 to have achieved the program's short-term goals and for the

participating institutions and states to have made progress in achieving the program's long-term goals. Prompt action is also required to meet the requirements of GPRA Goal 8d.

Section 3: Evaluation Design

Study questions. Ten study questions will be answered, as described below. Four questions (Q1–Q4) involve predictor variables, three questions (Q5–Q7) involve the achievement of program goals (outcome variables), one question (Q8) involves the relationship between predictor variables and the achievement of program goals, and two questions (Q9–Q10) involve comparison groups.

1. What level of NIH resources (in terms of funding and staff support) was allocated to the BRIN/INBRE program during its first five years?
2. What were the baseline characteristics of the IDeA states at the start of the program in each of the following areas?
 - Previous research experience
 - Number of medical schools, major medical centers, and research institutes
 - State's financial health
 - State's commitment to higher education
 - Population density of the state
 - Number of existing COBRE centers
 - State's contribution to BRIN/INBRE

At the start of the program, were some states quite different than others with respect to their baseline characteristics? If so, what were the distinguishing characteristics of the different types of states?

3. What were the baseline characteristics of the BRIN/INBRE networks at the end of Year 1 in each of the following areas?
 - Number of participating institutions
 - Number of faculty members in scientific fields
 - Number of undergraduate and graduate degrees awarded in science and health-related fields
 - Total area (square feet) available for research
 - Lead institution's research experience
 - PI's administrative and research experience
 - Core directors' management and research experience
 - Number of participating research faculty
 - Research experience of participating faculty
 - Extent of previous collaboration among the institutions
 - Institutions' commitment to support BRIN/INBRE

At the end of Year 1, were some networks quite different than others with respect to their baseline characteristics? If so, what were the distinguishing characteristics of the different types of networks?

4. How did the BRIN/INBRE networks implement the following program activities recommended by NCRR during their first five years?
 - Upgrading research facilities
 - Improving bioinformatics capability
 - Recruiting additional investigators
 - Offering new courses, research training, and grantsmanship workshops
 - Mentoring junior faculty and students
 - Providing research support to investigators (release time, shared facilities, laboratory personnel)
 - Addressing the needs of baccalaureate, community, and tribal colleges
 - Ensuring effective management and communication systems
 - Working with advisory committees and evaluators to assess needs, develop goals, and track progress

Which strategies were used to implement each type of activity? Who was involved in developing and/or implementing particular activities? Were any strategies revised during this period? Were there major changes in how the BRIN/INBRE grantees allocated their grant funding during Years 2–5? If so, why were the budget allocations revised?

5. To what extent were the BRIN/INBRE networks able to achieve the following short-term goals during their first five years?
 - Improved research facilities and support services, including bioinformatics
 - Successful recruitment of junior and senior investigators from different disciplines
 - Increased collaboration among researchers and institutions
 - More students majoring in science and health-related fields
 - More students and faculty participating in research activities
 - More science faculty and permanent research positions
 - More scientific publications and presentations
 - More applications for NIH research grants
 - More undergraduate students pursuing science and health-related careers.
6. To what extent were the BRIN/INBRE networks able to make progress in achieving the following long-term goals during their first five years?
 - Development of a statewide multidisciplinary research network
 - More science courses and programs offered
 - More undergraduate and graduate degrees awarded in science and health-related fields
 - Increased success competing for NIH research grants
 - Increased state and institutional commitment to research
 - Increase in the proportion of total NIH funding received by the state

7. Did distinctive patterns of success emerge? Did some networks make more progress in achieving certain goals and other networks make more progress in achieving other goals?

If so, what were the most common patterns of success? Which networks were similar to each other with respect to the types of goals they achieved?

8. Why were some BRIN/INBRE networks more successful than others during their first five years?

To what extent were specific state and network baseline characteristics related to subsequent success in achieving BRIN/INBRE goals? Comparing the more successful networks with less successful networks, can states with strong potential and/or networks with strong potential be identified from their baseline characteristics? To what extent were specific program activities related to overall success in achieving BRIN/INBRE goals? To what extent were specific program activities related to achieving the goals associated with the most common patterns of success? Can best practices be identified?

9. Comparing BRIN/INBRE networks that had a higher number of science faculty in FY 2001 with networks that had fewer science faculty, which group made more progress during the next five years in increasing the number of science faculty? Which group made more progress in expanding the pipeline of students pursuing science and health-related careers? Were there significant differences in the performance of the two groups during this period?
10. Comparing the BRIN/INBRE undergraduate institutions with a comparable group of academic institutions in non-IDeA states that offered similar degrees and had about the same number of graduates and science faculty in FY 2001, which group made more progress during the next five years in increasing the number and percentage of two-year and four-year degrees awarded in science and health-related fields? Which group made more progress in increasing the number of science faculty? Were there significant differences in the performance of the two groups during this period?

Target population. To answer the study questions, information is needed with respect to two target populations: the 23 BRIN/INBRE networks funded from FY 2001 to FY 2006 and the 23 states in which they are located. The primary units of analysis for the study will be the participating networks and states.

Conceptual framework. The feasibility study included the development of a conceptual framework illustrating how the BRIN/INBRE program is intended to work (see Exhibit 1). The framework identifies specific characteristics and program activities of BRIN/INBRE states and networks (predictor variables) that are expected to influence the achievement of the program's short-term and long-term goals (outcome variables).

Key variables. For the outcome evaluation, data will be collected for each of the 44 variables shown in the conceptual framework. As part of the feasibility study, each variable was operationally defined, pilot tests were conducted to identify the best data source(s) for each

variable, and a final set of operational definitions and data sources was recommended for the full-scale evaluation.

Section 4: Data Collection and Analysis

Data sources. A variety of data sources are recommended for the full-scale evaluation of the BRIN/INBRE program, based on the results of the literature review and pilot tests conducted during the feasibility study. With respect to primary data, the following data sources are recommended:

- A Web-based survey to obtain information on BRIN/INBRE networks that is not available from secondary data. The survey will consist of four data forms (questionnaires) that can be answered online by BRIN/INBRE PIs, representatives from the participating institutions, and project leaders (individuals serving as lead investigators for BRIN/INBRE research projects with assistance provided by one or more mentors).
- Structured telephone and onsite interviews with NCRR staff who have been involved with the BRIN/INBRE program and with BRIN/INBRE participants serving in different roles (e.g., PIs, associate program directors, core leaders, project leaders, mentors, steering committee members, EAC members, senior administrators at BRIN/INBRE institutions)

With respect to secondary data, the following data sources are recommended:

- NIH Consolidated Grant Applicant and Fellow File (CGAFF)
- National Library of Medicine PubMed database
- NIH Computer Retrieval of Information on Scientific Projects database
- National Science Foundation (NSF)-NIH Survey of Graduate Students and Postdoctorates in Science and Engineering (graduate student survey)
- NSF-NIH Survey of Science and Engineering Research Facilities
- Department of Education's (ED) Integrated Postsecondary Education Data System (IPEDS)
- ED National Study of Postsecondary Faculty
- U.S. Census Bureau data
- *The Chronicle of Higher Education*
- Reports from AAMC and other organizations representing medical schools and medical centers
- Reports of the National Governors Association and National Association of State Budget Officers
- BRIN/INBRE RFAs, grant applications, summary statements, Year 1 implementation plans, annual progress reports, and annual budgets
- Web sites developed by NIH, BRIN/INBRE networks, academic institutions, and organizations involved in medical education

Data collection strategies. Several data collection instruments were developed and pilot-tested during the feasibility study to collect primary data on specific variables involving BRIN/INBRE networks and their participating institutions and project leaders. Pilot tests were conducted to develop a set of four data collection forms (Microsoft Excel spreadsheets) that can be completed by BRIN/INBRE participants without excessive respondent burden:

- Network Snapshot at End of Year 1
- Network Overview form
- Institution form
- Project Leader form

The data collection forms will be presented as a Web-based survey to be completed by specific BRIN/INBRE participants. A Network Snapshot at End of Year 1 and Network Overview form will be forwarded to the current PI of each BRIN/INBRE network, an Institution form will be forwarded to the steering committee representative of each participating institution, and a Project Leader form will be forwarded to each current and former BRIN/INBRE project leader. Each person will receive a letter of invitation to participate in the survey, the URL of the survey site, a PIN and password allowing respondents access to only their type of data collection forms, instructions for completing the survey and submitting it to the evaluation team, and definitions and examples of specific terms used in the data forms. Prior to the data collection, analysts will have entered into a database selected information previously submitted by the networks in annual progress reports, other program documents, and Web sites. During the survey these data will appear in the appropriate fields of each network's data collection forms, and respondents will be asked to verify the accuracy of the prefilled information when completing the forms. The instructions and definitions will also be available in the Web-based survey as context-sensitive links. Respondents will be given 4–6 weeks to complete the survey and submit it directly to the evaluation team. Participation in the survey will be entirely voluntary; individual responses will be kept confidential and will not be shared with other network participants (including the PI) or NCRR program staff.

Three strategies will be used during the full-scale evaluation to collect secondary data from the various data sources listed earlier:

- Document review (e.g., BRIN/INBRE grant applications, annual progress reports, AAMC reports)
- Database extraction (e.g., CGAFF, graduate student survey, IPEDS, PubMed)
- Web site analyses (e.g., NIH grants Web site, BRIN/INBRE Web sites)

The specific data collection strategies that will be used to answer each study question are shown in Exhibit 2.

Clearance requirements. The data collection strategies involving the telephone interviews, onsite interviews, and Web-based surveys will require Office of Management and Budget (OMB) clearance. The findings of the feasibility study (including the forms and procedures developed during the study) should make it possible to satisfy OMB requirements without excessive delay. Because the CGAFF is covered by the Privacy Act of 1974, authorization to use the file must be obtained from NIH before the analyses are conducted. In addition, the contract for conducting the full-scale evaluation should include Federal Acquisition Regulation clauses specified by the NIH Office of Extramural Research for use of the CGAFF, requiring that any individuals extracting data from the CGAFF or working with individual-level data obtained from the CGAFF have a level 6C security clearance. Use and storage of CGAFF data will also follow procedures consistent with clearance requirements.

Data integrity. Several pilot tests were conducted during the feasibility study, and the data collection instruments and procedures were revised based on pilot test results. In addition to using pretested instruments and procedures, the reliability and validity of the study data will be enhanced by conducting training sessions to ensure that the analysts thoroughly understand the data collection and coding procedures, including the operational definitions of the study variables. In addition, the analysts will collect and code data independently using written data collection and coding protocols, and inter-rater reliability checks will be conducted to improve the internal consistency and replicability of the findings. The study team will discuss any cases where the scores differ substantially until a consensus is reached. In addition, agreed-upon algorithms will be used to calculate summary scores for the study variables that have more than one component and an overall success score for each BRIN/INBRE network.

Ethical considerations. Participation in the full-scale evaluation will be entirely voluntary, and individual responses will be kept strictly confidential in keeping with Privacy Act requirements. The study will address the sensitivities of the study participants by ensuring that respondents will not be identified by name or position in any resultant reports, and findings with respect to grant application and award rates will be reported at an aggregate level that will not allow individual investigators to be identified. In addition, confidentiality agreements will be signed by all members of the study team who will be reviewing grant applications, summary statements, annual progress reports, and other information contained in NCRR grant files.

Data preparation. An evaluation database will be created to keep track of the data collected for each of the variables in the conceptual framework. Quantitative data obtained from the CGAFF and other electronic databases will be electronically transferred to the evaluation database whenever possible; in cases where the information must be entered by hand, it will be verified by a second analyst. Relevant qualitative and quantitative information collected during telephone interviews, onsite interviews, document reviews, and Web site analyses will be transferred to coding sheets and coded (if appropriate) before being entered into the database. User-friendly input screens for entering different types of data will be designed to expedite data entry, and standard data verification procedures (such as edit and range checks) will be developed to validate the data entered and maximize the integrity of the evaluation database.

Other steps will also be taken to prepare the data for analysis, depending on the nature of the variable. Most of the key variables used in the evaluation are quantifiable on a ratio scale (e.g., population density of the state, number of faculty members in scientific fields, number of NIH research grant applications and awards) and will require little additional preparation. In measuring changes through time for these quantifiable variables, both the numeric increase/decrease and percentage change that occurred between the two time periods will be calculated. Some of the variables are qualitative in nature (e.g., institution's commitment to support BRIN/INBRE, program activities to improve bioinformatics capability and provide research support to investigators), in which case pretested coding procedures based on the variable's operational definition will be used by the analysts to translate the data collected for a particular network into a 5-point Likert-scale score. The variables are also different in that some consist of only one component and some have several components. For each variable that has more than one component, an algorithm will be developed (based on the operational definition) to calculate a summary score for the variable. Specifically, the results for each component will

be converted into a standardized z-score, with a positive z-score indicating an above-average rating and a negative z-score indicating a below-average rating. The z-score for each component will then be weighted (as specified in the algorithm) to determine the summary score for the variable. Finally, a similar process will be used to generate an overall success score for each network, using an agreed-upon algorithm that summarizes the extent to which the network achieved the program's short-term and long-term goals during the program's first five years. Because it is expected that it will take more than five years for the networks to fully achieve the program's long-term goals, it is recommended that the algorithm for generating a network's overall success score place more weight on the achievement of the short-term goals than the long-term goals.

Data analysis. Given the relatively small number of BRIN/INBRE networks (n=23), a multiple case study design with cross-site analysis is recommended. A variety of analytical techniques will be used (e.g., descriptive statistics, *t*-tests for matched and independent samples, cluster analysis, correlation analysis, chi-square analysis, qualitative analysis) to answer the study questions. For most questions involving changes through time, performance in FY 2006 will be compared with baseline performance in FY 2001 (prior to the establishment of the BRIN/INBRE program); in some cases performance in Year 5 will be compared with performance in Year 1. The analytical strategies for addressing each study question are presented below.

To answer **study questions 1–4**, data will be analyzed and summarized to present a comprehensive description of the level of NIH resources allocated to the BRIN/INBRE program, baseline characteristics of the IDeA states and BRIN/INBRE networks, and various strategies that were used by the networks to implement specific program activities during their first five years. **Study questions 5–6** will then be answered to assess the extent to which each of the program's goals was achieved by the participating networks. In most cases, *t*-tests for matched samples will be used to determine whether the networks' recent performance was significantly different from baseline performance; chi-square analysis will also be performed to determine whether there were significant changes in the proportion of total NIH funding received by the IDeA states (comparing FY 2006 with FY 2001). In assessing whether different patterns of success emerged (**study question 7**), a statistical grouping technique such as cluster analysis will be used for determining whether the 23 BRIN/INBRE networks can be classified into subgroups based on the types of goals they made the most progress in achieving. For example, the results may reveal that one subgroup of networks made the most progress in expanding their pipeline of students pursuing science and health-related careers and another subgroup of networks made the most progress in expanding the pool of NIH-experienced investigators.

Based on the findings for study questions 5–6, an overall success score will be generated for each BRIN/INBRE network using an agreed-upon algorithm that summarizes the extent to which the network achieved the short-term and long-term program goals. The relationship between each predictor variable and overall success (**study question 8**) will then be computed using Pearson product-moment correlation coefficients. The results of the correlation analysis will indicate which of the state characteristics, network characteristics, and program activities were most highly related to overall success in achieving the program's goals. To obtain the type of qualitative data needed to fully answer study question 8, the full-scale evaluation will include a combination of site visits and telephone interviews with participants at six of the more successful

and six of the less successful BRIN/INBRE networks. The 12 networks will be selected based on the results of study questions 5–7; site visits will be conducted at three of the more successful and three of the less successful BRIN/INBRE networks and targeted telephone interviews (including group interviews via conference call) will be held with different types of participants at the other six networks. These case studies will supplement data collected from other sources by describing in much more detail how specific program activities were implemented and why some practices worked better than others, providing additional insight into best practices.

Study questions 9–10 involve internal and external comparison groups. To answer **study question 9**, two groups of BRIN/INBRE networks will be compared with each other; the groups will be selected based on the total number of full-time faculty working in science and health-related fields at each network’s institutions in FY 2001. This question focuses on two institutional measures of performance: 1) expansion (or reduction) of the pipeline of students pursuing science and health-related careers and 2) expansion (or reduction) of the size of the science faculty, in each case comparing FY 2006 with FY 2001. The first measure involves five outcome variables: more students majoring in science and health-related fields, more students participating in research activities, more undergraduate students pursuing science and health-related careers, more science courses and programs offered, and more undergraduate and graduate degrees awarded in science and health-related fields. The second measure involves four different outcome variables involving faculty in science and health-related fields: number of faculty, successful recruitment of junior and senior investigators, more faculty participating in research activities, and more science faculty and permanent research positions. Because each performance measure has several components, a summary score will be generated for each measure prior to analysis. *T*-tests for independent samples will be performed to determine whether one group’s performance was significantly better than the other group’s performance during this period.

To answer **study question 10**, the undergraduate institutions that participated in a BRIN/INBRE network for the program’s first five years will be compared with a group of comparable institutions in non-IDeA states, matched as closely as possible with respect to type of institution (e.g., public, private not-for-profit, private for-profit), types of degrees offered (e.g., associates degree, baccalaureate degree), number of degrees awarded in science and health-related fields, and number of full-time faculty working in science and health-related fields in FY 2001. This study question focuses on the following institutional measures of performance: 1) increase (or decrease) in the number and percentage of two-year and four-year degrees awarded in science and health-related fields, and 2) expansion (or reduction) of the size of the science faculty, in each case comparing FY 2006 with FY 2001. *T*-tests for matched samples will be conducted to determine whether the performance of the BRIN/INBRE institutions was significantly better than the performance of the non-BRIN/INBRE institutions during this period.

Section 5: Evaluation Results

Products of the Evaluation

Results of the full-scale evaluation of the BRIN/INBRE program will be presented to NCRR in a draft report. The report will include an introduction to the evaluation, a background section

describing the program, and a detailed description of the findings for each of the study questions. Wherever possible, analytical results will be presented in tables and graphs designed to highlight the study's findings. The conclusion of the report will include recommendations for enhancing the program and tracking future progress, based on the findings of the evaluation. After the draft report has been reviewed by NCRR staff and an EAC, a final report for the evaluation will be produced.

Dissemination of Results

The findings of the full-scale evaluation of the BRIN/INBRE program will be used by NCRR to address congressional inquiries regarding the impact of the BRIN/INBRE program, develop strategies to enhance the program's effectiveness, track the future progress of the BRIN/INBRE networks, and improve program management. In addition, BRIN/INBRE PIs and other participants will be able to use the results to compare their network's performance with that of other networks, learn about best practices implemented by the most successful networks, and improve the management of their networks. The final report will be disseminated to a broad audience; it is anticipated that the methodology and results of the evaluation of the BRIN/INBRE program will be useful to administrators in other NIH Institutes and Centers and non-NIH organizations who are interested in enhancing the research capacity of states, research networks, and institutions.

Section 6: Project Management

Project Implementation

The full-scale evaluation of the BRIN/INBRE program will be conducted by an independent contractor who will be selected in accordance with NIH policies. The study team (i.e., the contractor and any subcontractors proposed) must have expertise in program evaluation, data management, statistical analysis, and the collection of primary data through site visits and telephone interviews; experience using the CGAFF, PubMed, and the other secondary sources recommended; and substantial knowledge of NIH and the BRIN/INBRE program. In addition, it is desirable for the study team to have experience conducting outcome evaluations for other NIH Institutes and/or Centers.

External Advisory Committee

During the course of the full-scale evaluation, an EAC will be convened to provide advice to NCRR and the evaluation team. It is recommended that the committee include some members of the feasibility study EAC and that two to three meetings be held during the course of the evaluation, some of which may be held via conference call. The EAC will be responsible for advising the evaluation team on implementation issues that may arise, reviewing the findings of the evaluation, and suggesting ways in which the BRIN/INBRE program could be enhanced in the future. Suggestions could involve the content of future solicitations for the BRIN/INBRE program, criteria that study sections could consider when reviewing BRIN/INBRE grant proposals, and specific information that could be collected on a regular basis to track the future progress of the BRIN/INBRE networks.

Estimated Timeline for the Evaluation

It is expected that the full-scale outcome evaluation of the BRIN/INBRE program will require approximately 24 months to complete, not including the time required to obtain NIH Evaluation Set-Aside funding and select the contractor.

Section 7: Budget Estimate

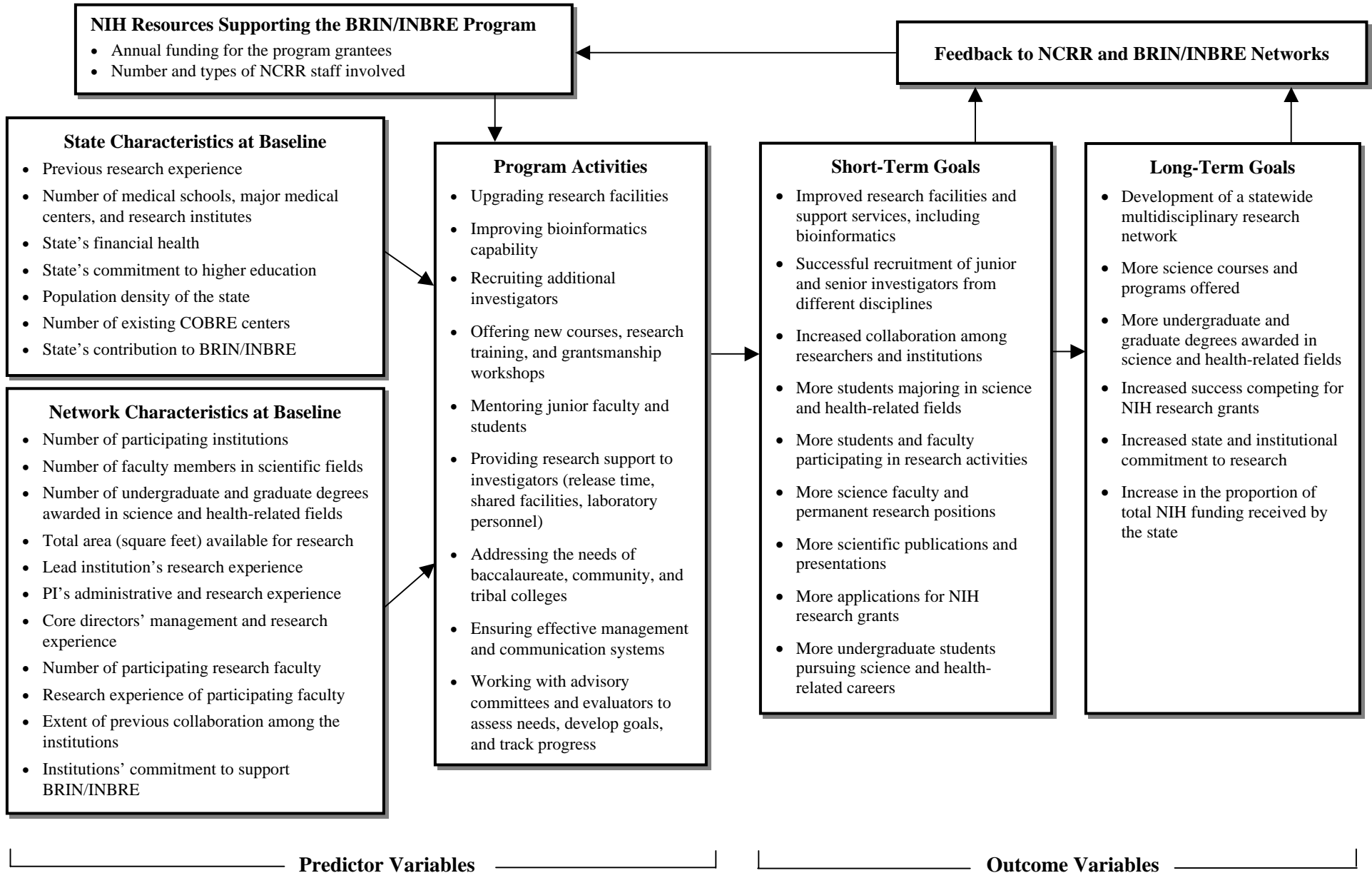
Estimated Cost

[to be completed by NCRR]

Anticipated Funding Sources

[to be completed by NCRR]

EXHIBIT 1. CONCEPTUAL FRAMEWORK FOR THE EVALUATION OF THE BRIN/INBRE PROGRAM



**EXHIBIT 2. DATA COLLECTION STRATEGIES
FOR ANSWERING SPECIFIC STUDY QUESTIONS**

	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10
Document review	X	X	X	X	X	X	X	X	X	
Database extraction		X	X		X	X	X	X	X	X
Web site analyses		X	X	X	X	X	X	X	X	X
Web-based survey (data forms)			X	X	X	X	X	X	X	X
Telephone interviews with:										
PIs, associate project directors, other key personnel			X	X			X	X		
Project leaders				X				X		
				X	X			X		
Mentors Senior administrators at institutions				X			X	X		
EAC members				X			X	X		
NIH staff	X	X			X					
Onsite interviews (site visits)		X		X	X	X	X	X		