



National Institutes of Health
Office of Nutrition Research

Advanced Training in Artificial Intelligence for Precision Nutrition Science Research (AIPrN)

Office of Nutrition Research (ONR)

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Overview

Concept Clearance: New Program: Advanced Training in Artificial Intelligence for Precision Nutrition Science Research (AIPrN) — T32

Objective: To support the development of a diverse research workforce that will possess advanced competencies in artificial intelligence (AI) to apply innovative transdisciplinary approaches to an increasingly complex landscape of Big Data on nutrition and diet-related chronic diseases.

Funds Available and Anticipated Number of Awards: Contingent upon the availability of funds, participating institutes intend to fund 8-12 programs in FY2023 (~\$350,000 per program)

Program Duration: Up to 5 years

Council Action: Vote for support of the program



Program Goal

This program aims to build a future workforce that will be able to make pivotal discoveries using an increasingly complex landscape of Big Data and a wide array of data tools to tackle complex biomedical challenges in nutrition science and diet-related chronic diseases.

Initiative

- An institutional research training program [T32] for advanced training in artificial intelligence for precision nutrition science research (AIPrN)
- ONR and participating institutes intend to co-fund 8-12 programs, contingent upon NIH appropriations and the quality of proposals



Why train new experts?

- Poor nutrition has an enormous impact on disease, disability, and death in the United States and globally, and nutrition-related diseases are by far the leading driver of health disparities.
- The perception is that there are too few well-trained, multi-disciplinary scientists with the expertise to address these burdens, and an urgent need for new ideas, methods, and approaches to solve these problems.
- Participants from our [Precision Nutrition Workshop](#), which had an entire day dedicated to AI and Machine Learning, noted a strong need for this type of institutional training.



Why train new experts? (*cont.*)

- The workshop participants also noted that the usual advanced courses in nutrition do not offer training in AI, data science, and computational approaches required to analyze the increasingly diverse datasets being made available.
- Such training can help nutrition researchers develop AI and machine learning algorithms to make pivotal discoveries and tackle complex biomedical challenges in diet-related chronic diseases.
- Despite federal priorities to train workers with the skills to develop and apply AI technologies, a search of our portfolio found that of 1809 NIH T32 Institutional training grants, none have a focus on AI or machine learning, and only 24 focus on nutrition science.



Program Components

- Trainees will be chosen for support and participation based on their need to apply AI to a nutrition-relevant project, and will acquire core knowledge in three overarching relevant areas:
 - **Artificial Intelligence (AI)**, including machine learning, with competencies in computer science/informatics and data science
 - **Biostatistics/mathematics**
 - **Nutrition Science, Chronic Disease Pathophysiology, and Systems Science**, in a chosen health domain relevant to the ICs participating in this program announcement
- The aspects of AI and biostatistics studied should be directly relevant to nutrition/diet-related disease systems science.



Program Components (*cont.*)

- This program is intended for both pre- and postdoctoral trainees and should have sufficient flexibility/personalization to accommodate trainees from different backgrounds.
 - Predoctoral trainees should be appointed in the early stages of their doctoral program and for a minimum of 2 years.
 - The Office of Nutrition Research intends to convene and facilitate annual cross-site exchanges among faculty and trainees.
- Each T32 program should include interdisciplinary faculty, e.g., nutrition, bioinformatics, or biomedical sciences (focused on diet-related diseases of interest to participating Institutes), computational and data sciences, computer engineering, and biostatistics/informatics, etc.



Mentorship

- Multiple mentors and team-based science is strongly encouraged
 - The intended FOA requires applicants to assemble an interdisciplinary team of scientific mentors (training committee) to design and direct a training program matched to the applicant's expertise and needs.
 - Applications must include mentors from both nutrition science (or nutrition-related chronic disease) and AI/machine learning-related disciplines.
 - Ideally, the trainees will have at least two primary mentors who have different areas of expertise to foster a truly cross-disciplinary training experience.



Diversity in Trainees

- Applicants will be asked to prioritize the training of a diverse workforce in nutrition science.
- Applicants should be able to explain the institutional success or strategy for increasing the diversity of trainees.
 - For example, the applicant training program should either **be** or consider linking their proposed training programs to trainees and/or faculty of Historically Black Colleges and Universities (HBCUs) or other Minority Serving Institutions.
- Applicants should consider trainees who are either enrolled in a RD-MS (or equivalent) or Ph.D. program or have obtained either of these degrees.



Diversity and Research Topics

While projects selected for training across the translational spectrum of the sponsoring institutes are encouraged, ideally a number of those should aim to make discoveries from large datasets in order to:

- Reduce the rate of diet-related chronic diseases that disproportionately affect minorities and those with other disparities
- Reduce nutrition health disparities due to race, ethnicity, geographical location, income or educational attainment
- Reduce food insecurity and hunger



A Commitment to Ensure The Success of the Training Program and Trainees

The application **must include a signed letter from an institution President, Provost, or Dean**, etc. that describes the activities and resources provided by the institution that will ensure the success of the planned training program and its trainees. This will address 12 points, for example:

- Policies that ensure availability of funding so that graduate students can complete their doctoral training if their mentor experiences a hiatus in funds or leaves the institution;
- Policies that ensure that faculty with a role in the proposed program have sufficient time available to devote to the responsibilities of the program



A Commitment to Ensure The Success of the Training Program and Trainees (*cont.*)

- Institutional commitment to providing an environment free of discrimination, harassment, and other prohibited practices by explicitly addressing areas laid out in [NOT-OD-19-029](#); and
- Efforts to provide family-friendly environments, accommodations and leave policies including but not limited to, timely access to affordable childcare services and accommodations for extended medical, family care or emergency circumstances that may impact or cause delays in scientific productivity.
 - The institutional support letter must describe the financial and/or environmental support mechanisms available to trainees to help achieve their full career development potential despite the occurrence of critical life events.



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Thank you!

