FACULTY MENTORS HANDBOOK

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

NIH T32 Grant

PROGRAM TITLE: Increasing and Diversifying Future AI-Precision Nutrition Research Workforce to Promote Nutrition Health Equity among Underserved Populations

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PROGRAM INTRODUCTION

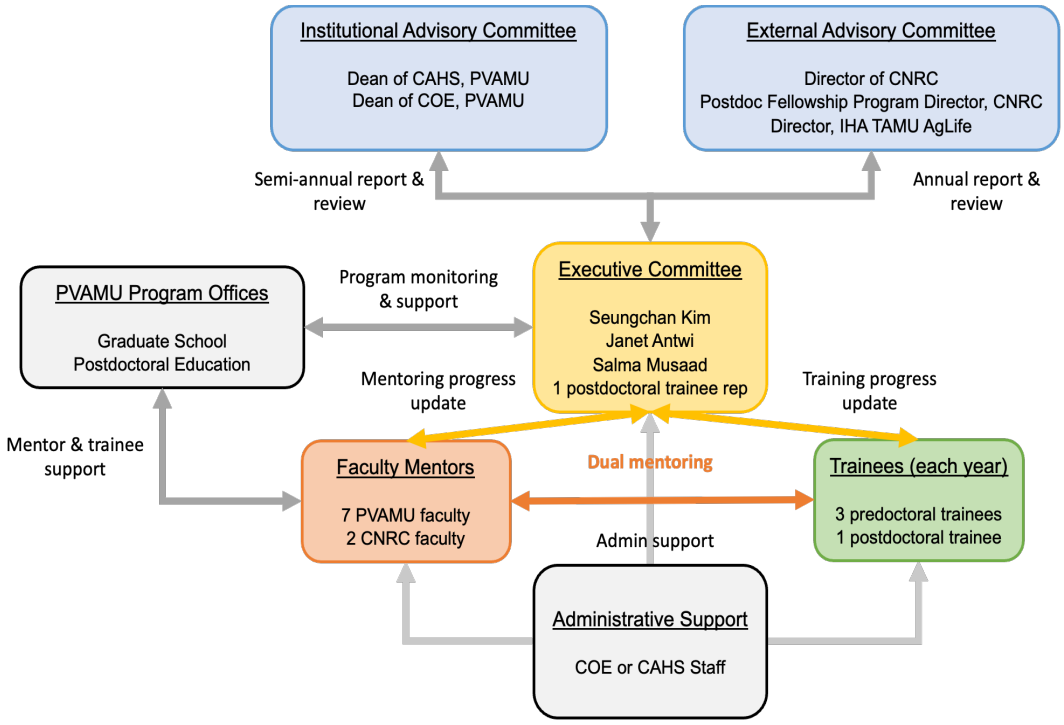
The *Increasing and Diversifying Future AI-Precision Nutrition Research Workforce to Promote Nutrition Health Equity among Underserved Populations* program is an NIH T32 research training program to train pre-doctoral and post-doctoral trainees for research related diet-related chronic diseases, nutrition disparities, and food insecurity/hunger. The purpose of this research training is to support the development of a diverse research workforce of predoctoral students and postdoctoral fellows who will possess advanced competencies in AI/ML to apply innovative transdisciplinary approaches to an increasingly complex landscape of Big Data on nutrition and diet-related chronic diseases. The research training program is herein referred to as the Artificial Intelligence-Precision Nutrition (AIPrN) research training program.

Faculty mentors are key to safeguarding the intellectual and professional development of trainees in this AIPrN research training program. The *Faculty Handbook* serves as a guide for all faculty mentors to understand and commit to the mission of the program, roles, and evaluation. This document is subject to annual evaluation and revisions.

RESEARCH TRAINING PROGRAM ORGANIZATIONAL STRUCTURE

The Organizational Structure network of experienced multidisciplinary faculty and inter-institutional mentors is ideally suited to develop the next generation of AI-Precision Nutrition scientists prepared for a career as nutrition health disparities investigators. Figure 1 below demonstrates the Organizational Structure of the AIPrN research training program which constitutes the Executive Committee, Faculty Mentors, Advisory Committee, Trainees, Administrative Support, and Prairie View A&M University Program Offices.

Figure 1.



FACULTY MENTORS ROLES

The Faculty Mentors together will be responsible for the training of the trainees in didactic coursework in AI/ML, and precision nutrition as well as engage them in research projects. They will interact to build collaborative relationships and share their requisite expertise to meet the objectives of this program. The Faculty Mentors will meet quarterly with the Executive Committee.
The AIPrN research training program has four areas in the curriculum which consists of the Academic, Research Mentorship, Supporting Areas, and Annual Workshop.

Academic
Rigorous didactic training in PN/nutritional courses, data science, analytical methods, and computational approaches will be incorporated into the curriculum and the curriculum is attached in Appendix A below.

Research Mentorship
All trainees will be engaged in laboratory rotations for sample research project activities and later choose a research lab that fits best with their research and career interest as their long-term training.

Supporting Areas
All trainees will be offered in training in Leadership skills, Professional development, Career development, Grant writing and manuscript development, Conferences/scientific meetings, Seminars/talks

Annual Workshop
An annual career-centered workshop constituting of guest speakers and experts from NIH, BCM, IHA, Tufts, UI-UC, HDHS, among others will be hosted.

1. Develop and Teach courses

Faculty mentors who are willing to develop and teach courses (courses or modules) can do so in consultation with the Executive Committee of the research training program. The content needs to be relevant to the AIPrN focus disciplines or topics including Nutrition, Food Insecurity/Hunger , Genetics, Imaging, Microbiome, Physiology, Behavioral factors (e.g., diet, activity), Cultural and Social Influences, and Environmental Exposures.

2. Research Mentorship

Engagement in laboratory rotations for research project activities are focused on one or more of the disciplines or topics above. Faculty mentors may utilize publicly available data such as EHR, NHANES, USDA, AHRQ and CDC social determinants of health data, AllOfUs, or own data.

3. Professional Development

Faculty mentors may instruct trainees in professional development activities, including attendance of workshops and seminars in grant writing, manuscript development, career development advising with the Career Services, and the NIH mandatory annual cross-site BSSR Data Analytics T32 Program grantee meetings.

FACULTY MENTORS SELECTION CRITERIA

Faculty mentors with vast experience in the related research projects, research training programs, and mentoring capability forms the basis for their selection into this AIPrN research training program and help create a comfortable and inviting research and training environment for trainees from diverse backgrounds.
The Executive Committee will evaluate the faculty annually for the appointment or reappointment, with consideration for the following criteria: 1) history of successful research; 2) commitment to training and history of successful mentorship; 3) how the research focus fits within the theme/areas of study of the Program Obesity, Diabetes, CVD, Cancer, Food insecurity/Hunger, etc; 4) funding to support the research environment in the appropriate program area; 5) collaboration with other Program faculty; 6) engagement with the Program; and 7) access to big data

FACULTY MENTORS EVALUATION

Faculty mentorship quality will be evaluated annually by MPDs/MPIs (Executive Committee) based on the data collected from trainees.

Faculty may be required to provide documentation on their inclusion of Responsible Conduct of Research (RCR) discussion and other related activities as part of their engagement with the trainees. RCR documentation will be included within a dedicated section in the respective reports or in a separate standard form.

CURRENT LIST OF FACULTY MENTORS

Faculty mentors in the AIPrN research training programming are drawn an interdisciplinary team from Prairie View A&M University (PVAMU) and the partner organization, USDA-ARS Children's Nutrition Research Center at Baylor College of Medicine (USDA-ARS CNRC BCM).

PVAMU

1. **Lijun Qian** (Big Data and Deep Learning) – Texas A&M University System Regents Professor and AT&T Endowed Professor in the Department of Electrical and Computer Engineering and Director of Center of excellence in Research and Education for big military Data InTelligence (CREDIT)
2. **Xishuang Dong** (AI and Machine Learning) – Assistant Professor at the Department of Electrical and Computer Engineering, Center for Computational Systems Biology (CCSB) and CREDIT
3. **Andrea McDonald** (Nutrition and Nutrition Informatics) – Assistant Professor in the Department of Health and Kinesiology
4. **Gloria Regisford** (Biology and Genomics) – Texas A&M University System Regents Professor
5. **Victoria Mgbemena** (Microbiology, Cell Biology and Genetics) – Assistant Professor at Biology Department
6. **Javad Barouei** (Microbiology and Nutrition) – Associate Professor of Food and Nutritional Sciences

USDA-ARS CNRC BCM

1. **Teresia O'Connor** (Pediatric Nutrition) – Board certified, practicing general pediatrician and fellowship trained clinician researcher
2. **Yong Xu** (Pediatric Nutrition) – Professor of Pediatric Nutrition, Department of Pediatrics and Associate Director for Basic Sciences at Children's Nutrition Research Center at Baylor College of Medicine
3. **Deborah Thompson** (USDA/ARS Scientist/Research Nutritionist - Child Obesity) – Professor of Pediatrics
4. **Jennette Moreno** (Sleep, circadian rhythms, screen use, seasonality/patterns in children's height and weight gain, the influence of the school year and summer environment on children's health behaviors and growth, development of mobile health interventions, the impact of evening screen use on sleep and circadian rhythms, use of wearable data to assess sleep and circadian health) – Assistant Professor of Pediatrics
5. **Kathleen Motil** (Large dataset) – Retired Professor of Pediatrics
6. **Jayna Dave** (health disparities and social determinants of health inequity) – Associate Professor of Pediatrics

7. **Alli Antar** (Obesity and type two diabetes, inflammation, liver disease, and atherosclerosis – mouse models and cell lines) – Assistant Professor
8. **Alexis Caroline Wood** (Epidemiology, Precision nutrition& precision lifestyles) – Assistant Professor
9. **Erica Soltero** (Community-engaged research strategies to reduce obesity and type 2 diabetes disparities in high-risk minority youth) – Assistant Professor of Pediatrics
10. **Robert Waterland** (Pediatrics and Molecular & Human Genetics) – Professor of Pediatrics
11. **Hari Yalamanchili (**

APPENDIX A

AIPrN Research Training Program Curriculum

The Curriculum will be added here after it is finalized next week.