To: Computational Approaches to Diabetes and Metabolism Research Faculty Members
From: Karen Eilbeck, PhD and Marcus Pezzolesi, PhD, MPH
Date: August 25, 2022

University of Utah Interdisciplinary T32 Training Program in Computational Approaches to Diabetes and Metabolism Research

Request For Applications

Overview of the Program

The University of Utah Interdisciplinary Training T32 Program in Computational Approaches to Diabetes and Metabolism Research will cross-train a cadre of predoctoral and postdoctoral trainees in the computational and mathematical sciences *and* in the biological basis of diabetes and obesity. These bioinformatics scientist trainees will gain the expertise and leadership skills to apply computational and mathematical methods to complex biological questions that will ultimately impact the prevention, treatment, and outcomes of people with diabetes and related metabolic diseases. This training program will consist of a combination of mentored research and career development training, coursework, and extensive interactions with faculty and trainees across campus and beyond.

Trainee positions:

At this time, we are requesting applications for ***three pre-doctoral trainees positions only***. Trainees may have either a computational or biological background, but must propose to be cross-trained as part of this program.

Submission Deadline:
September 19, 2022

If you have questions, please contact
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barbara.saffel@utah.edu

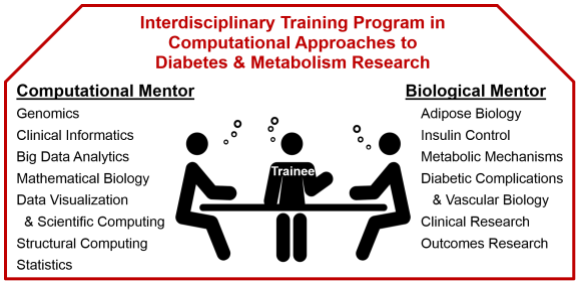

Figure 1. Diagram of Program Faculty Categories and Subgroups. Each trainee will have both a computational and biological mentor to serve as the foundation of their mentoring committees. Research disciplines within the mentorship groups are indicated.

Program Details:

Each trainee will be required to have at least one computational and one biological mentor to serve as the foundation of their mentoring team. Computational Mentors can be pulled from the broad fields of Genomics, Clinical Informatics, Big Data Analytics, Mathematical Biology, Data Visualization and Scientific Computing, and Structural Computing. Biological Mentors can be pulled from research themes of Adipose Biology and Insulin Control, Metabolic Mechanisms, and Diabetic Complications and Vascular Biology. Mentors for this training Program are listed in the tables at the end of this document. Mentors not included in these lists and from different research areas may also be eligible to participate in the program.

Program Requirements:

1. Dual-Mentored Research: Each Trainee is required to participate in dual-mentored research with at least one computational and one biological mentor, spending time in both mentors research space.
2. Computational Approaches to Diabetes and Metabolism Research Interest Group: Trainees will be required to attend this new monthly interest group as it will serve as the program hub.
3. Seminar Attendance: Trainees will be required to attend the Seminars in Metabolism Lecture Series and/or other Departmental Seminar Series.
4. Scientific Conferences: Trainees will be encouraged to attend national conferences and will be provided $1000 to attend one conference during their tenure on the grant.
5. Diabetes and Metabolism Center Annual Retreat: Trainees will be expected to attend and present at this event.
6. Mentoring Committee: Trainees will be expected to organize and meet with a mentoring committee consisting of both computational and biological faculty mentors and an additional 2-3 faculty mentors.
7. Individual Development Plan (IDP): Trainees are expected to complete an IDP and review the IDP with their mentoring committees.
8. Clinical Shadowing: All trainees without clinical experience will be required to shadow a physician in Internal Medicine one day/year.
9. Coursework: All trainees will be required to supplement their current training with additional coursework, depending on the trainee background. Courses that may be of interest are shown in Table 1. Additional courses that are not listed may also be appropriate for this program.
10. Responsible Conduct of Research: All trainees are required to complete Responsible Conduct of Research Training VPR Course or PHIL 7550 (Research Ethics) or MDCRC6430 (Bioethical Issues in Clinical Research) offered through the CCTS.
11. Program Evaluations: Trainees will be required to fill out biannual evaluation surveys.

Table 1. Courses that may enhance training

Courses that expand biological knowledgebase	
BIOC 6600	Regulation of Metabolism
BME6010	Systemic Physiology II
HGEN6421	Genetics of Complex Disease
NUIP6240	Nutritional Epidemiology
NUIP6460	Metabolism of Micronutrients
BMI6117	Introduction to Healthcare
Courses that expand computational knowledgebase	
BME 6770	Genomic Signal Processing
BME7777/7778	Applied Genomics I/2
BME 6760	Modeling and Analysis of Biological Networks
BIOL 5910	Mathematical Models in Biology
BMI 6010	Foundations of Healthcare Informatics
BMI 6030	Foundations in Bioinformatics
BMI6015	Applied Machine Learning in Biomedical Informatics
BMI6019	Bioinformatics in Practice: RNA-Seq Data Analysis
BMI6060	Applied Computational Genomics

BMI6806	Translational Informatics
BMI 6530	Bioinformatics Data Integration and Analysis
BMI 6701	Population & Public Health Informatics
MATH 6830/6835	Mathematical Biology 1/2
PHS6710/6715	Introduction to Population Health 1/2
PHS7020	Analysis of Secondary Data
PHS7100	Epidemiologic Theory and Methods
PHS7120	Molecular Epidemiology
CS6635	Visualization for Scientific Data
MDCRC 6020-001	Clinical Research Data Management
Courses that enhance professional skills	
MDCRC 6450	Grant Writing
MBIOL 7570	Case Studies and Research Ethics
MDCRC 6430	Bioethical Issues in Clinical Research

Application Instructions:

Applications should include the items below. Items 1-6 should be compiled into a single PDF and emailed to Barbara.saffel@utah.edu by ***September 19, 2022.***

1. Computational Approaches to Diabetes and Metabolism Training Grant Cover Page (attached to this email).
2. Your curriculum vitae, including the following: a) List of all publications to date; b) Degree(s) earned, including both the month and year earned; c) Research Experience and other Positions, including both the month and year of each start/end date; d) Identify any prior NRSA support.
3. A short (2 page) carefully thought out summary of your proposed research project. Summarize the problem (include some strategic literature references), preliminary data, and your research goals for your tenure as a Graduate Student or Postdoctoral Trainee on this training grant. There is a limit of 2 pages, including figures, but excluding References. (References may be included as additional pages). Font must be 11pt Arial with 1 inch margins.
4. Mentorship Plan (1/2 page max). This should be developed in collaboration with both computational and biological mentors. This plan should address the role of each mentor in your mentoring committee and proposed training.
5. Statement of Career Goals (1/2 page max).
6. For graduate students - Copies of your academic transcripts, both undergraduate and graduate.
7. For graduate students - Copy of the original report of your GRE scores. Please state prior degree, University and GPA.
8. Two recommendation letters, one from each proposed computational and biological mentor. At least one mentor's letter should comment on the independence with which the applicant composed the proposal. Letters of recommendation may be emailed directly to barbara.saffel@utah.edu.

Additional Training Grant Policies that you should be aware of are:

1. The primary criteria for selection will be a) scientific excellence, b) relevance of the proposed research to diabetes, obesity, or metabolism (as the grant funder is NIDDK), c) level of cross-disciplinary training proposed, d) potential for future applicant success (publications, grants, etc).
2. The NIH strongly encourages applications from a) underrepresented minorities, b) disabled individuals, and c) individuals from a disadvantaged background.
3. We particularly encourage applications from predoctoral trainees in year 2 or 3 of training and postdoctoral trainees in year 1 or 2 of training. However, trainees in all training years may apply.
4. Support is provided for a maximum of 2 years. Second year support is subject to evaluation by the training grant steering committee and availability of grant funds. In certain circumstances, only one year of support may be available.
5. NIH requires that trainees be U.S. citizens, U.S. noncitizen national or a permanent resident of the U.S.
6. Graduate Students must be residents of the State of Utah and eligible for in-state tuition.

For additional information, please contact Barb Saffel, Barbara.saffel@utah.edu.

List of Mentors included in this program. **Mentors not listed may still be eligible for this program.**

Table 2. Computational Mentors.

Name/Degree(s)	Rank	Department Affiliation	Research Area	Research Interest
Frederick Adler, PhD	Professor	Mathematics	Big Data, Visualization, Modeling	Mathematical models for complex biological systems, including diabetes
Guilherme Del Fiol MD, PhD	Assoc. Professor	Biomedical Informatics	Clinical Informatics	Delivery of patient-specific clinical evidence from the literature and Web into electronic health records to support clinical decision making
Karen Eilbeck, PhD	Professor	Biomedical Informatics	Genomics/Clinical Informatics	Genome sequence annotation, Genomic variation, precision medicine, ontologies and standards development
Julio Facelli, PhD	Professor	Biomedical Informatics	Big Data, Visualization, Modeling	Parallel and distributed computing applications in biomedical informatics, drug and protein structural computing
Angela Fagerlin, PhD	Professor	Population Health Sciences	Population Health Sciences	Risk communication and development, testing, and implementation of patient decision aids for health condition including diabetes
Tom Greene, PhD	Professor	Population Health Sciences	Population Health Sciences	Clinical trial design and statistical analysis with expertise in chronic kidney disease
Sheetal Hardikar, PhD	Assist. Professor	Population Health Sciences	Population Health Sciences	Molecular and lifestyle factors are associated with chronic conditions often characterized by inflammation, particularly diabetes
Lynn Jorde, PhD	Professor	Human Genetics	Genomics	Human genetic variation and disease, whole genome sequencing analysis
Kensaku Kawamoto, MD, PhD	Assoc. Professor	Biomedical Informatics	Clinical Informatics	Clinical decision support, application of informatics to support improvement of clinical outcomes in personalized health care
Alexander Lex, PhD	Assist. Professor	Computer Science	Big Data, Visualization, Modeling	Interactive data visualization and analysis applied to molecular biology and pharmacology
Gabor Marth, DSc	Professor	Human Genetics	Genomics	Development of genomic big data analysis tools
Elissa Ozanne, PhD	Assist. Professor	Population Health Sciences	Population Health Sciences	Decision support interventions to engage women in lifestyle change
Aaron Quinlan, PhD	Professor	Human Genetics	Genomics	Utilization of computer science and machine learning techniques to develop genomic technologies
Andrea Wallace, PhD	Assoc. Professor	Nursing	Population Health Sciences	Interventions to improve quality of diabetes care and care transitions
Mark Yandell, PhD	Professor	Human Genetics	Genomics	Software development for model system and human whole genome sequencing, rapid metagenomic analysis, computational architecture for outcomes research

Table 3. Biological Mentors.

Name/Degree(s)	Rank	Department Affiliation	Research Area	Research Interest
Kelly Baron, PhD	Associate Professor	Family and Preventive Medicine	Health Behaviors	Biopsychosocial relationships between sleep, circadian rhythms and cardiometabolic disorders
Srinivasan Beddhu, MD	Professor	Internal Medicine (Nephrology)	Diabetes Complications	Obesity, malnutrition, and cardiovascular disease in CKD and dialysis patients
Maria Bettini, PhD	Associate Professor	Pathology	Integrative Metabolic Physiology	mechanisms of tolerance and their failure in autoimmune diabetes
Matthew Bettini, PhD	Associate Professor	Pathology	Integrative Metabolic Physiology	TCR signaling and thymocyte development
Owen Chan, PhD	Associate Professor	Internal Medicine (Endocrinology)	Diabetes Complications	Impaired glucose counterregulation and hypoglycemia unawareness
Albert Cheung, MD	Professor	Internal Medicine (Nephrology)	Diabetic Complications and Vascular Biology	Translational and clinical research related to chronic kidney disease and end-stage renal disease
Clement Chow, PhD	Assist. Professor	Human Genetics	Cellular and Molecular Mechanisms	Role of genetic variation on disease
Margaret Conroy, MD, MPH	Professor	Internal Medicine (General Internal Medicine)	Health Behaviors	Clinical and epidemiological research on behavior change, weight loss, and prevention of diabetes
Stavros Drakos, MD, PhD	Professor	Internal Medicine (Cardiovascular Medicine)	Diabetes Complications	Mechanisms underlying myocardial failure and recovery
Brian Evavold, PhD	Professor	Pathology	Integrative Metabolic Physiology	T cell recognition of antigen and regulation in T1D
Katsu Funai, PhD	Assoc. Professor	Physical Therapy and Athletic Training	Integrative Metabolic Physiology	Intracellular fate of lipids into membrane phospholipids and cellular energetics

William Holland, PhD	Assist. Professor	Nutrition and Integrative Physiology	Integrative Metabolic Physiology	Influence of adipokines and cytokines on insulin action, insulin secretion, food intake, energetic expenditure, and diabetic complications
Erik Jorgenson	Professor	Biology	Cellular and Molecular Mechanisms	Synaptic signaling and *C. elegans* genetics
Lewis Charles Murtaugh, PhD	Assoc. Professor	Human Genetics	Cellular and Molecular Mechanisms	Pancreatic development and regeneration
Ryan O'Connell, PhD	Assoc. Professor	Pathology	Cellular and Molecular Mechanisms	Roles of microRNAs in regulating both physiological and pathological development in mammals, with a focus on inflammation, diabetes, and obesity
Marcus Pezzolesi, PhD	Assist. Professor	Internal Medicine (Nephrology)	Diabetes Complications	Genetics of diabetes and diabetes complications
Mary Playdon, PhD	Assist. Professor	Nutrition and Integrative Physiology	Health Behaviors	Dietary biomarker development using metabolomics
Jared Rutter, PhD	Professor	Biochemistry	Cellular and Molecular Mechanisms	Studies of phosphorylation-mediated control of metabolism and mitochondrial abnormalities in human disease
Amnon Schlegel, MD, PhD	Assoc. Professor	Internal Medicine (Endocrinology)	Adipose Biology and Insulin Control	Utilizes zebra fish and in vitro model systems to uncover new regulators of lipid metabolism
Scott Summers, PhD	Professor	Nutrition and Integrative Physiology	Integrative Metabolic Physiology	Impact of ceramides on nutrient homeostasis, diabetes, and metabolic diseases
Carl Thummel, PhD	Professor	Human Genetics	Cellular and Molecular Mechanisms	Functional studies of evolutionarily-conserved mitochondrial proteins; genetic studies of diabetes and insulin resistance
Corinne Welt, MD	Professor	Internal Medicine (Endocrinology)	Metabolic Mechanisms	Polycystic ovary syndrome and the link to insulin resistance and diabetes
James Keener	Professor	Math	Mathematical Physiology Research	Developing, validating and implementing mathematical models of integrated biological processes
Sihem Boudina	Assoc Prof	Nutrition and Integrative Physiology	Cellular and Molecular Mechanisms	Understanding how mitochondrial dysfunction contributes to the pathogenesis of obesity, type 2 diabetes and cardiovascular disease