

**Penn Center for Nutritional Science and Medicine (PenNSAM)
Pilot and Feasibility Grant Program 2020**

Purpose and Research Focus:

The mission of PenNSAM is to facilitate research in diet and nutrition focused on the integration of clinical data, traditional dietary assessments, and nutritional biomarkers with the latest tools in molecular profiling and biostatistics. PenNSAM is issuing a request for pilot and feasibility applications to enable the research community at Penn and CHOP to learn more about how these new technologies can be applied to research in human nutrition. **Specifically, this P&F request is for studies on human diet and nutrition in one of two categories:**

Category 1: Studies where both clinical phenotyping, diet and/or nutrition data, and biospecimens (plasma, urine, or stool) have been collected or will be completely collected by the end of 2020.

Category 2: Previously generated high dimensional analytic datasets (i.e. metabolomic, microbiome, proteomics, etc.) requiring additional analyses by the PenNSAM Nutrition Analytic Core (PNAC, see services listed below).

For applications belonging to **Category 1**, PenNSAM will perform untargeted metabolomics free of charge for up to 250 biospecimens via proton NMR and mass spectrometry through a PenNSAM collaboration between Penn and Penn State University. Both lipidomic and general small molecule platforms are available. Once metabolomic datasets have been generated, the PenNSAM Nutrition Analytic Core (PNAC) will work together with the PI to perform analyses focused on integrating clinical metadata with the metabolomics dataset. There will be no charge for data analytics.

The Standard Analytic Services Provided by PNAC (for applications belonging to **Category 2**):

1. Calculation of food pattern scores based on NDSR, DHQ, and ASA 24 data: The Healthy Eating Index-2015 (HEI-2015); The Alternative Mediterranean Diet (AMED); The Diet Inflammatory Index (DII); The Empirical Dietary Inflammatory Index (EDII); and The Diet Approach to Stop Hypertension (DASH) score.
2. Basic descriptive statistics, statistical tests and regression analysis, including generalized linear regression and Cox regression analysis.
3. Data processing, quality control, batch-effects adjustments for metabolomics using the standard Bioinformatics software tools such as ComBat and SVA methods.
4. Exploratory analysis to identify possible outliers, data transformation, clusters and patterns in the data sets using methods such as PCA, MDS, eSNE etc.
5. Differential abundance analysis based on omics data including analysis on 16S rRNA gene and shotgun metagenomic microbiome data.
6. Machine learning methods such as Lasso and random forests to build predictive models for various clinical outcomes using high dimensional omics data.

Eligibility:

All faculty members (including Instructors and Research Associates) of the University of Pennsylvania scientific community. Applicants must be a U.S. Citizen or have a permanent resident visa.

Proposal Preparation:

1. Submit a pdf via email to Wade Kirkpatrick (Wade.Kirkpatrick@penmedicine.upenn.edu). Complete proposals are due by 5:00 pm, September 15, 2020.

2. Format

- Cover page: Includes title, an abstract of up to 250 words, and the approved IRB protocol title and approval number for the clinical study pertaining to the proposed pilot.
- NIH biographical sketch
- NIH other support
- Sections for the main proposal include specific aims, background, preliminary results, and research plan
- Page limit for the main proposal: 4 pages total, including references

Critical questions that should be addressed in the application are:

- a) What were the questions to be addressed by the original study, were the endpoints achieved, and what were the findings?
- b) What type of clinical metadata, dietary information, or other analytic data were collected in the study?
- c) How will the addition of a metabolomic dataset be of value to your study—i.e. how might you be able to better answer a scientific question and/or address a new one?
- d) Have you previously generated and/or analyzed metabolomic datasets?
- e) Will the addition of metabolomics to your study lead to a new publication and/or allow you to apply for additional grant funding? If the latter, will you be applying for a specific RFA?
- f) If applying for **option 1**, what biospecimens have been collected, at what time windows, how were they aliquoted and archived, and how much is available for analysis (100 microliters are needed per sample)?
- g) If applying for **option 2** involving data analytics by PNAC, what type of analytic tools/approaches do you envision that are needed for the analysis of your dataset?

Award Terms:

- Grants reviewed by the end of October 2020, with announcement of awardees by November 15, 2020.
- Assays and data analysis to be conducted through 2021.
- A final progress report is due one month after the close of the project period. The report will contain a one-page synopsis of scientific progress and a list of resulting collaborations, publications, and grants.
- Awardees may be asked to provide brief interim reports concerning research activities, resulting publications, and fundraising that may be highlighted at the annual PenNSAM symposium.

For additional information and/or questions, please contact:

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