

NATIONAL LIBRARY OF MEDICINE, NIH
BOARD OF SCIENTIFIC COUNSELORS
MEETING MINUTES
October 13, 2022

The Board of Scientific Counselors of the National Library of Medicine (NLM) convened by webcast on October 13, 2022, between 11:00 a.m. and 4:00 p.m. The meeting was open for viewing via NIH VideoCast.

BSC Members Participating

Peter Tarczy-Hornoch, MD, University of Washington (*BSC Chair*)
Bonnie Berger, PhD, Massachusetts Institute of Technology
Graciela Gonzalez Hernandez, PhD, University of Pennsylvania
Hyun Min Kang, PhD, University of Michigan
Lucila Ohno-Machado, MD, PhD, University of California, San Diego
Ming Jack Po, MD, PhD, Ansible Health
Eric Rouchka, DSC, University of Louisville
Donna Slonim, PhD, Tufts University
Pamela Soltis, PhD, University of Florida
Jessica Tenenbaum, PhD, Duke University
Valerie Florance, PhD, NLM (*Executive Secretary*)

NIH Staff Presenting

Patricia Flatley Brennan, RN, PhD, NLM
Valerie Florance, PhD, NLM

NLM Senior Investigators Receiving Review

Aravind Iyer, PhD, NCBI, NLM
David Landsman, PhD, NCBI, NLM

1. Welcome and logistics – Peter Tarczy-Hornoch

Dr. Tarczy-Hornoch welcomed participants to the meeting, noting that Eric Rouchka is a new member of the committee, and provided some brief introductory remarks.

2. Remarks from NLM Director – Patricia Flatley Brennan

Dr. Brennan thanked the BSC members for their service to NLM and introduced the NLM leadership team via a slide. She described the goals of the NLM Strategic Plan and select NLM activities to prepare for the future, including:

- Strengthening leadership through strategic hires (e.g., Steve Sherry named NCBI Director, and NLM is planning for a new position of Deputy Director for Operations and Innovation)
- Creating a culture of continuous innovation
- Advancing NLM's commitment to diversity, equity, inclusion, and accessibility

She also highlighted advances in extramural research (e.g., a framework to evaluate the social impact of algorithms, and a bionic eye project) and presented one of the videos NLM has produced on work of its intramural researchers.

She provided an update on NLM Resources, including the release of sequences in GenBank from recent viral outbreaks of polio and monkeypox (now being called Mpox). She noted the improvements made to dbGaP, tools introduced through the NIH Comparative Genomics Resource (CGR), and enhancements to ClinVar and ClinicalTrials.gov.

Dr. Brennan also updated the BSC on NLM's budget and appropriations, and she noted OSTP's memorandum on making datasets available without embargo. In addition, she provided an update on the renovation of NLM's infrastructure, including the data center utility project that will provide improved cooling services, and renovations to NLM's buildings.

3. Remarks from NLM Acting Scientific Director – Valerie Florance

Dr. Florance described NLM's Diversity in Data Science and Informatics (DDSI) research program, which was created with recognition that a diverse workforce is necessary to drive innovation and scientific advancement and with the aim of providing equitable training opportunities to the next generation of leaders in data science and informatics. The DDSI program provides interns with participation in a mentored research project, cohort activities such as a journal club, and other mentorship and career-oriented opportunities. Dr. Florance noted that NLM learned a lot from its inaugural effort with five interns and has identified areas for change.

Dr. Florance highlighted NLM's new Intramural Research Program website and its two-minute "Meet the Team" videos that describe the investigators' work. She also introduced the BSC virtually to NLM's newest tenure-track investigator: Jeremy Weiss, whose focus is clinical temporal machine learning.

Dr. Florance updated the BSC on NLM responses to their recommendations at their last meeting, during which they reviewed Drs. Lauren Porter and Xiaofang Jiang. Dr. Florance noted that NLM is preparing to hire a staff scientist to work with Dr. Porter and has put in a request for additional lab space for her. NLM also is preparing to hire a staff scientist for Dr. Jiang, per the BSC's recommendation.

4. Presentation and Review of Aravind Iyer, Senior Investigator

Dr. Iyer described his research, which involves computational analysis of protein sequences and structures. He focused much of his presentation on his group's work on biological conflict systems, or interactions wherein one of the genetic entities or both suffer a loss to their fitness. He noted that these can be seen across the range of biological organization, starting from prey-predator interactions down to host-pathogen interactions at the microscopic level.

Dr. Iyer also described his lab's future directions, including areas that represent continuity of existing work, as well as new horizons.

Areas of Continuity

- Evolution and logic of biological conflict systems
- Augmenting some computational work with wet lab collaborators
- Expanding studies on the foundations of multicellularity to the interplay between adhesion systems and biological conflict
- Identifying novel second messenger-generating and processing systems that might recognize the specific modifications in viral molecules
- Evolutionary history of translational quality control continuing with the work on ribosome rescue

New horizons

- The role of environmental DNA as a glue and phosphate reservoir with consequences for the biofilms, and the ecosystem of proteins involved in this process
- The metabolite NAD⁺ in non-redux roles; viruses and the immunity against them; comprehensive investigation of enzymes and ligand-binding proteins in the NAD⁺-ADP network
- Origin and evolution of enzymes involved in the generation of low molecular weight metabolites in plant immunity
- The giant rhodanese-protein phosphatase superfamily

Following Dr. Iyer's presentation there was a Q&A session, after which the BSC went into closed session with him.

5. Presentation and Review of David Landsman, Senior Investigator

The research of Dr. Landsman's group involves investigations into the structure, function and interactions of chromatin proteins, as well as the development of pipelines for next-generation sequencing (NGS) analysis at the level of genome annotation and gene expression. He focused his presentation on three main areas of his research: transcription regulation, the interactions between nucleosomes and chromatin factors, and pipelines for NGS analysis.

He highlighted the following research:

Transcription regulation

- Characterization of the role of HMGN proteins in high-order chromatin structures
- Development of a model of active transcription hubs that unifies the roles of active promoters and enhancers

Characterization of the interactions between nucleosomes and chromatin factors

- Histone/nucleosome structure and interactions with binding partners
- Understanding the effects of post-translational modifications and mutations on histone tail dynamics and interactions

Pipelines for NGS analysis

- Detection and removal of foreign contamination on RNA-Seq samples
- *De novo* transcriptome assembly, annotation, and submission for unannotated organisms
- Development of PM4NGS, a project management framework for NGS data analysis

Following Dr. Landsman's presentation there was a Q&A session, after which the BSC went into closed session with him.

6. Report to NLM Acting Scientific Director and DDIR Designee (Closed Session)

7. Adjournment

Dr. Tarczy-Hornoch, Chair (Date)
Board of Scientific Counselors

Dr. Valerie Florance (Date)
Acting Scientific Director, NLM