

NATIONAL LIBRARY OF MEDICINE, NIH
BOARD OF SCIENTIFIC COUNSELORS
MEETING MINUTES
October 21, 2021

The Board of Scientific Counselors of the National Library of Medicine (NLM) convened by webcast on October 21, 2021, 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*)
Graciela Gonzalez Hernandez, PhD, University of Pennsylvania
Hyun Min Kang, PhD, University of Michigan
Kateryna Makova, PhD, Pennsylvania State University
Lucila Ohno-Machado, MD, PhD, University of California San Diego
Ming Jack Po, MD, PhD, Google Health
Donna Slonim, PhD, Tufts University
Pamela Soltis, PhD, University of Florida
Jessica Tenenbaum, PhD, Duke University
Valerie Florance, PhD, NLM (*Executive Secretary*)

BSC Ad Hoc Member

Simon Webb, PhD, VeraChem LLC

NIH Staff Presenting

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

NLM Senior Investigators Receiving Review

Ivan Ovcharenko, PhD, NCBI, NLM
Yi-Kuo Yu, PhD, NCBI, NLM

1. Welcome and logistics – Peter Tarczy-Hornoch

Dr. Tarczy-Hornoch, the new chair of the BSC, welcomed participants to the meeting and outlined the schedule for the day.

2. Remarks from NLM Director – Patricia Flatley Brennan

Dr. Brennan thanked the BSC members for their service to NLM and to science. She highlighted recent NLM activities, including:

- Progress on NLM's Strategic Plan

- COVID-related projects (e.g., English and Spanish videos to support the NIH Community Engagement Alliance (CEAL), computational research on mutations that increase the risk of evading antibodies, development of FHIR API extensions to support VSAC COVID-19 codes, and a number of efforts related to SARS-CoV-2 genome sequence data)
- Grants, SBIR initiatives and resources aimed at reducing health disparities
- Improvements to operations, including speeding Medline indexing through greater use of automated curation, implementation of the Alma Library Services Platform, assessment of the Datascience@NLM program, and assessment of the Preprint Pilot

Dr. Brennan also updated the BSC on the ongoing renovation to NLM's building, the proposed NLM budget for fiscal 2022, and NIH's plans for the Advanced Research Projects Agency for Health (ARPA-H), which will be a special division that focuses on high-risk, high-reward projects.

3. Remarks from NLM Acting Scientific Director – Valerie Florance

Dr. Florance noted that NLM has completed one of two recruitments for new independent investigators for the Intramural Research Program (IRP): Sameer Antani, PhD. Dr. Antani has been with NLM since 2001 as a Staff Scientist and is now a tenure track investigator. His areas of expertise include artificial intelligence and image processing.

Dr. Florance briefly described the NLM Intramural Research Training Program and the process for reviewing IRP investigators. She also summarized the April 23, 2021, review of Dr. Clement McDonald.

4. Presentation and Review of Ivan Ovcharenko, Senior Investigator

Dr. Ovcharenko described his group's research over the last four years, which focused on genomic coding of regulatory elements (REs), computational modeling of cell type-specific REs, mechanistic impacts of mutations on the activities of REs, and prediction of disease-causative RE mutations.

Among the research projects he presented was use of a deep learning model of neocortical enhancers using human and macaque embryonic neocortex data. Results of that work suggest that the essential mutations of neocortical enhancers may be one of the components underlying autism in humans. He also presented work on application of their method to causative noncoding variants associated with pancreatic function in Type 2 diabetes.

Dr. Ovcharenko outlined his group's proposed research for the next four years, which includes deep learning methods for regulatory DNA encoding, transcriptional condensates and "overbound" enhancers, super-silencers and disease-causative silencer mutations, predictive causative regulatory variants across genome-wide association study diseases, and Type I Diabetes and mental health regulatory genomics.

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

5. Presentation and Review of Yi-Kuo Yu, Senior Investigator

Dr. Yu presented his group's research, which aims to 1) mitigate noise (conflicting information) by developing analysis methods that can assign accurate statistical significance to identified signals, and 2) build a firm foundation at the microscopic level with rigorous models for molecular interaction. The research focuses on electrostatics and mass spectrometry: mass spectrometry is used to provide identities of constituents, while electrostatics is used to compute the interaction forces among constituents.

Dr. Yu described several of his research projects, including a Robust Acute Identification (RAId) web service for peptide and protein ID, and the Microorganism Classification and Identification (MiCId) workflow, which is an MS-based workflow for fast and accurate microbe/protein identification and biomass estimation. He detailed research using MiCLd for early detection of pathogens in the blood.

Future projects include speeding up identification of microorganisms and identifying antibiotic resistant proteins, and applying exact electrostatics formalisms to model interactions among biomolecules and/or molecular complexes such as viruses.

Following Dr. Yu's presentation there was a brief Q&A, which included a discussion of the possibility of patenting work such as Dr. Yu's that could have clinical impact. After the Q&A session the BSC went into closed session with Dr. Yu.

6. Poster Session with Trainees (Closed session)

7. Report to NLM Acting Scientific Director and DDIR Designee (Closed session)

8. Adjournment

Peter Tarczy-Hornoch 1/28/22

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

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