NATIONAL ACADEMIES Sciences Engineering Medicine

Epigenetics Workshop: Reflections on NSF's Understanding the Rules of Life Program

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MEETING OBJECTIVES

- Discuss individual and collective scientific advancements toward understanding heuristics, predictable processes, and their exceptions for biological systems.
- Understand the contributions of disciplinary convergence in enabling or driving the scientific advances.
- Determine how research groups incorporated multi-disciplinary, systems-level approaches into their projects.
- Identify the broader implications of the scientific advances and research ecosystem (e.g., multi-disciplinary research) from research funded by the URoL program to address highly complex, interconnecting systems (e.g., the biosphere) and discuss the future of life-science research and education.
- Explore future societal needs and scientific questions that may be addressed by the achievements from the URoL (i.e., identify opportunities for exploration).
- Highlight rules of life that are generalizable across fields and scales.

JANUARY 26, 2023

OPEN

11:00-11:15 am EST **Welcome and Introductions**
Connie Mulligan, University of Florida

11:15-11:30 am **Information about the NSF Big Ideas URoL Program**
Connie Mulligan, University of Florida

11:30-11:40 am **Workshop Goals and Expectations**
Connie Mulligan, University of Florida

11:40-12:00 pm **Summary of URoL Principal Investigators' Responses to Previously Sent Questions**
Kunal Rai, MD Anderson Cancer Center, The University of Texas

12:00-1:20 pm **Interactive Discussion**

Moderators:

Alexander Gimelbrant, Altius Institute for Biomedical Sciences

Connie Mulligan, University of Florida

Kunal Rai, MD Anderson Cancer Center, The University of Texas

PI Discussants:

Julie Hotopp, University of Maryland, MTM2:CollaborativeResearch:Microbially-mediated epigenetic modifications alter host phenotypes

Kaushik Ragunathan, Brandeis University, URoL: Epigenetics 2: Robustness and Adaptability of the Dynamic Epigenome: A Multiscale Approach

Jeffrey Lozier, University of Alabama, URoL: Epigenetics 2: Collaborative Research: Bumble bee cold tolerance across elevations - From epigenotype to phenotype across space, time, and levels of biological organization

Keith Slotkin, Donald Danforth Plant Science Center, URoL: Epigenetics 2- Collaborative Research: Revealing how epigenetic inheritance governs the environmental challenge response with transformative 3D genomics and machine learning

Lydia Contreras, University of Texas at Austin, URoL: Epigenetics 1: Collaborative Research: Novel epitransciptomics tools to understand and modulate interactions of modified RNAs with protein readers and erasers

Hollie Putnam, University of Rhode Island, URoL: Epigenetics 2: Predicting phenotypic and eco-evolutionary consequences of environmental-energetic-epigenetic linkages

1:20-1:30 pm **Break**

1:30-1:50 pm **Attendees' Views on Common Themes**

Alexander Gimelbrant, Altius Institute for Biomedical Sciences

1:50-2:00 pm **Summary of Key Outcomes and Themes**

Connie Mulligan, University of Florida

2:00 pm **Adjourn**