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Dual Perspectives

DP01: What Does Dopamine Encode?

Location: Virtual Only

Time: Tuesday, November 9, 2021, 12:00 PM - 1:00 PM

Description: The discovery of reward prediction error coding during reinforcement learning represents a dramatic success story in linking computational theory to experimental evidence. In addition to a teaching signal, recent studies report a diversity of information coding in tegmental dopamine neurons, including differential signals between dopamine release and cell body spiking for motivation and reward prediction error. Wolfram Schultz, Ilana Witten, and Josh Berke will directly address how these findings can be reconciled with traditional learning models of dopamine function.

Organizer/Moderator: *P. H. Janak

Johns Hopkins Univ., Baltimore, MD

Disclosures:

Speakers: I. Witten

Princeton University, Princeton, NJ.

Disclosures:

Speakers: W. Schultz

University of Cambridge, Cambridge, United Kingdom.

Disclosures:

Dual Perspectives

DP02: Can Artificial Intelligence (AI) Provide a Theoretical Framework For Understanding the Brain or Is It Too Far Removed From Physiology To Be Useful?

Location: Virtual Only

Time: Wednesday, November 10, 2021, 12:00 PM - 1:00 PM

Description: The capabilities of Artificial Intelligence and deep learning systems have risen dramatically in the past decade, now rivaling human performance on certain tasks. This rise has provoked neuroscientists to ask if concepts from AI research can be adapted to inspire neuroscience research. However, one major issue is that current AI systems bear only cartoon similarity to real brains. Do all the physiological details matter? Or can we ignore them and proceed to map current AI theories to brains?

Organizer/Moderator: *A. M. Zador

Zador Lab., Cold Spring Harbor Lab., COLD SPG HBR, NY

Disclosures:

Speakers: C. O'Donnell

Computer Science, University of Bristol, Bristol, United Kingdom

Disclosures:

Speakers: A. Fyshe

Machine Learning, Carnegie Mellon University, Pittsburgh, PA

Disclosures: A. Fyshe: None.

Speakers: S. A. Solla

Northwestern University, Chicago, IL.

Disclosures: S.A. Solla: None.

Dual Perspectives

A01: 50th Dual Perspectives — Studying Human Neurodevelopment and Diseases Using 3D Organoids and Assembloids

Location: Virtual Only

Time: Thursday, November 11, 2021, 12:00 PM - 1:00 PM

Description: Induced pluripotent stem cells (iPSCs) are increasingly being used to understand the neuronal and glial phenotypes related to neuropsychiatric disease. Similarly, brain organoid models are providing information on neuronal development and how this is altered in disease, while assembloids are providing insights into cell-cell interactions and circuit assembly. This 50th Anniversary Dual Perspectives session will bring together experts in these two areas to describe and debate the relative contributions of iPSCs-derived neural cells, organoids, and assembloids.

Organizer/Moderator: *M. Picciotto

Yale Univ. Sch. of Med., New Haven, CT

Disclosures:

Speakers: K. Brennand

Icahn School of Medicine at Mount Sinai, New York, NY.

Abstract: Combining advances in stem cell biology, neurobiology, and psychiatric genomics, we are helping to pioneer new approaches to study brain disease. By integrating stem cell models and CRISPR-mediated genomic engineering strategies, genetic predisposition to psychiatric disorders can be modeled *in vitro*.

Speakers: S. P. Pasca

Stanford University, Stanford, CA.

Disclosures: S.P. Pasca: None.

Storytelling

A02. 50th Storytelling Session — Oh Sh*t — Great Scientists Tell Stories About Their Greatest Failures

Location: Virtual Only

Time: Wednesday, November 10, 2021, 12:00 PM - 1:30 PM

Description: Science can be brutally difficult. The daily experience of science is often failure; most experiments fail, most grants are rejected, most job candidates never get an interview. Despite this, failure is rarely discussed in public and the long stumbling chain of failures that lead to scientific findings are hidden between the lines of publications. In this session, established scientists will tell their personal stories of crashing and burning: mistakes, fiascos, and deeply humbling moments.

Chair: M. H. Hagenauer;
University of Michigan, Ann Arbor, MI.

Disclosures:

Host: S. J. Firestein;
Dept Biology, Columbia University, New York, NY.

Disclosures:

Speaker: A. D. Redish;
Dept. Neurosci, University of Minnesota, Minneapolis, MN.

Disclosures:

Speaker: J. Cryan;
University College Cork, Cork, IRELAND.

Disclosures:

Speaker: V. A. Vaidya;
Tata Institute of Fundamental Research, Mumbai, INDIA.

Disclosures:

Speaker: N. D. Volkow;
NIH/NIDA, Bethesda, MD.

Disclosures:

Speaker: A. A. Fenton;
Center for Neural Science, New York University, New York, NY.

Disclosures: