

THE
DISCOVERY
LECTURE SERIES

DANA PE'ER, Ph.D.

PLASTICITY, GENE PROGRAMS
AND TUMOR PROGRESSION

SEPTEMBER 21, 2023

4:00 P.M.

208 LIGHT HALL

SPONSORED BY:
DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY

VANDERBILT  UNIVERSITY
MEDICAL CENTER

PLASTICITY, GENE PROGRAMS AND TUMOR PROGRESSION

Cellular plasticity, the ability to take on unexpected fates or identities, is a fundamental property of multicellular life that enables coordination during development and wound healing. Cancer hijacks and amplifies this plasticity. Dr. Pe'er exploits single-cell genomics to understand the causes and consequences of cellular plasticity. She will describe several approaches for quantifying plasticity and demonstrate how oncogenic mutation and environmental insults can lead to dramatic increases in tumor cell plasticity. Over and over, we observe that cancer cells use developmental plasticity as an adaptive mechanism for dealing with new environments and driving malignant progression. Dr. Pe'er will demonstrate a few examples where chromatin remodeling and cell-cell communication drives plasticity and crosstalk. Additionally, she will discuss a few computational approaches to characterize the gene programs underlying cellular phenotypes, including an application to immuno-oncology.



DANA PE'ER, PH.D.

**CHAIR, COMPUTATIONAL AND
SYSTEMS BIOLOGY PROGRAM
SCIENTIFIC DIRECTOR, ALAN AND
SANDRA GERRY METASTASIS AND
TUMOR ECOSYSTEMS CENTER
MEMORIAL SLOAN KETTERING
CANCER CENTER**

Dr. Dana Pe'er is chair of the computational and systems biology program and scientific director of the Alan and Sandra Gerry Metastasis and Tumor Ecosystems Center at Memorial Sloan Kettering Cancer Center. She studies how cells travel their developmental paths. Dr. Pe'er is interested in how healthy cells shape their identities, and how cancer cells abandon those identities to take on dangerous new abilities. Dr. Pe'er's work combines mathematical approaches with a range of emerging technologies that enable large-scale analyses of single cells.

The Pe'er lab has pioneered foundational machine learning approaches to derive cell states, trajectories and interactions from single-cell genomics and imaging data. They apply their tools to address questions in development, immunity and cancer, with a focus on plasticity, tumor heterogeneity, and tumor-immune interactions. Dr. Pe'er earned her PhD at the Hebrew University. She received the Burroughs Wellcome Fund Career Award, NSF CAREER award, NIH Director's New Innovator and Pioneer awards, Packard Fellowship in Science and Engineering, Ernst W. Bertner Memorial Award, ISCB Overton Prize Award and is a Fellow of the AACR Academy. She serves on the editorial board of *Cell*, leads an NCI Human Tumor Atlas Network center, and heads computational analysis for the Human Cell Atlas.

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Upcoming Discovery Lecture:

TIMOTHY SPRINGER, Ph.D.

*Professor of Biological Chemistry and Molecular Pharmacology,
Professor of Medicine, Harvard Medical School*

*Principal Investigator, Program in Cellular and Molecular Medicine,
Boston Children's Hospital*

February 8, 2024

208 Light Hall / 4:00 P.M.