Save the Date:
May 5 at 5:30 p.m. ET, Virtual Program

Lecture Title:
The Living Cell as an Integrated System

How does a cell execute the many functions that define a living entity? We discovered that robust chemically and genetically based logic circuits control cell cycle progression and cell differentiation. A critical question is how these control systems function in time and space within a tiny bacterial cell with just 4,000 genes. We have observed strong parallels between these "genetic circuits" and familiar engineering circuits. These expanding insights are providing unprecedented understanding of the asymmetric cell differentiation process essential to producing the diverse organisms found on the Earth.

LUCY SHAPIRO

Virginia and D.K. Ludwig Professor of Developmental Biology, Stanford University

Developmental Biologist Researcher Educator

Recipient of the 2020 Dickson Prize in Science

"It's the most exciting thing in the world to be a scientist, because you're like a detective — and what I do is try to understand what life is by starting with a very, very simple bacterial cell and understanding the genetic circuitry that control a living thing."
— Lucy Shapiro

Dr. Lucy Shapiro is a professor of developmental biology at Stanford School of Medicine where she holds the Virginia and D.K. Ludwig Chair in Cancer Research. She is also the director of the Beckman Center for Molecular and Genetic Medicine.

She is a member of the board of directors of Pacific Biosciences, Inc. She founded the anti-infectives discovery company Anacor Pharmaceuticals that was sold to Pfizer in 2016. She founded a second company, Boragen, in 2017.

Shapiro's work established a systems engineering paradigm underlying cell differentiation that has yielded fundamental insights into the living cell. This work has garnered her multiple awards, including the National Medal of Science in 2011, which was presented to her by President Barack Obama. She has also been elected to the American Academy of Arts and Sciences, the U.S. National Academy of Sciences, the U.S. National Academy of Medicine, the American Academy of Microbiology and the American Philosophical Society.

FROM ARTIST TO SCIENTIST

Shapiro's start in scientific research took an unconventional path. She describes her career journey from artist to scientist in this profile from The Scientist. Her success in the field of developmental biology is a reminder that an interdisciplinary approach to problem-solving is fundamental to innovation.

RESEARCH WITH IMPACT

Shapiro's work has furthered understanding of stem cell function and the generation of biological diversity, providing the basis for researchers to develop novel drugs to fight antibiotic resistance and emerging infectious diseases, which she discusses in this iBiology series video.

As mentioned in this interview with the *Journal of Clinical Investigation*, she takes a systems approach to these studies, viewing the bacterial cell as an integrated system in which to identify how networks of genes control cell decisions. With this, her work has implications for researchers beyond the field of developmental biology, such as cell and tissue engineers, computer science network and systems researchers and those interested in health and infectious disease more generally.