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COLLOQUIUM: Emerging imaging technologies to study subcellular architecture, dynamics and function

JENNIFER LIPPINCOTT - SCHWARTZ

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12:00 to 13:00
ICFO Auditorium & Online (Zoom)

Profile:
Dr. Jennifer Lippincott-Schwartz is a Senior Group Leader at the Howard Hughes Medical Institute's Janelia Research Campus and Head of the Research Program on 4D Cellular Physiology. Lippincott-Schwartz has pioneered the use of green fluorescent protein technology for quantitative analysis and modelling of intracellular protein traffic and organelle dynamics in live cells. Her innovative techniques to label, image, quantify and model specific live cell protein populations and track their fate have provided vital tools used throughout the research community. Her findings using these techniques have reshaped thinking about the biogenesis, function, targeting, and maintenance of various subcellular organelles and macromolecular complexes and their crosstalk with regulators of the cell

cycle, metabolism, aging, and cell fate determination. She is an elected member of the National Academy of Sciences, the National Academy of Medicine, the American Society of Arts and Sciences and the European Molecular Biology Organization. She co-authored the textbook i¿½Cell Biologyi¿½ and was President of the American Society of Cell Biology.
Dr. Lippincott-Schwartz attended Swarthmore College, received her MS from Stan
ord University, and obtained her PhD in Biochemistry from Johns Hopkins Univers

Abstract:
Powerful new ways to image the internal structures and complex dynamics of cells are revolutionizing cell biology and bio-medical research. In this talk, I will focus on how emerging fluorescent technologies are increasing spatio-temporal resolution dramatically, permitting simultaneous multispectral imaging of multiple cellular components. In addition, results will be discussed from whole cell milling using Focused Ion Beam Electron Microscopy (FIB-SEM), which reconstructs the entire cell volume at 4 voxel resolution. Using these tools, it is now possible to begin constructing a i¿½organelle interactomei?
½, describing the interrelationships of different subcellular organelles as they carry out crit
cal functions. The same tools are also revealing new properties of organelles and their traffic
ing pathways, and how disruptions of the organelle's normal functions due to genetic mutat
ons may contribute to important diseases.