Microtubules, Motors and Morphogenesis

Professor Jonathon (Joe) Howard
Yale University

Abstract

The Howard lab is fascinated by the question of how small molecules like proteins, lipids and nucleotides self-assemble into cells and tissues that are thousands to millions of times larger than molecular dimensions. How do the molecules know whether the structures that they have made are the right size and shape, and localized correctly within the cell? We are approaching these questions in the context of the microtubule cytoskeleton, which underlies the morphology and movement of eukaryotic cells. Using high-resolution and single-molecule techniques, we trying to trying to understand the interaction rules that allow molecules to work together to form highly organized, yet dynamic cellular structures. I will illustrate the principles using examples from cell division, cilia-driven movement and neuronal branching morphology.

Bio

Jonathon (Joe) Howard is the Eugene Higgins Professor of Molecular Biophysics & Biochemistry and a Professor of Physics at Yale University. He is best known for his research on motor proteins and the cytoskeleton, and the development of techniques for observing and manipulating individual biological molecules. Brought up in Australia, where he studied at the Australian National University, he has had a distinguished career in the United States—he was a professor at the University of Washington Medical School in Seattle—and in Germany, where he played a key role, as Director, in establishing the Max Planck Institute for Molecular Cell Biology and Genetics in Dresden, one of the most successful research institutes in Europe. In 2013 he returned to the United States where he enjoys teaching, writing and new research projects on cell motility and neuronal morphology.

DATE: Friday, 9th March

TIME: 11:00am – 12:00pm

VENUE: Seminar Room
Level 3
15 Innovation Walk
Monash University
Clayton Campus

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