

directed the Bangalore Microscopy Course. Dr. Vale's laboratory also developed MicroManager, free and open source software that controls light microscopes.

He recently served as President of the American Society of Cell Biology. In the biotechnology industry, Vale co-founded Cytokinetics, Inc. and currently serves on their scientific advisory board.

Dr. Vale's awards include the Lasker Award in Basic Medical Research, the Massry Prize, the Wiley Prize in Biomedical Science, the Pfizer Award in Enzyme Chemistry, and the Young Investigator Award from the Biophysical Society. He was elected to the National Academy of Sciences in 2001, the American Academy of Arts and Sciences in 2002, and the European Molecular Biology Organization in 2012.



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CELL AND DEVELOPMENTAL BIOLOGY
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RONALD D. VALE, Ph.D

MECHANISMS OF BIOLOGICAL MOTILITY

JANUARY 30, 2014
4:00 P.M.
208 LIGHT HALL



Upcoming Discovery Lecture:

RUSS ALTMAN, M.D., Ph.D.
Stanford University

February 6, 2014
208 Light Hall / 4:00 P.M.

VANDERBILT  UNIVERSITY
MEDICAL CENTER

MECHANISMS OF BIOLOGICAL MOTILITY

Movement is a fundamental property of living organisms. The contraction of muscle, beating of cilia and flagella, segregation of genetic material during mitosis, and intracellular transport of membranes, proteins and mRNAs are driven by molecular motor proteins that move along cytoskeletal filaments. The mechanism of kinesin is reasonably well understood through measurements of its single molecule motility and the elucidation of its atomic structure. Dynein, a much larger motor that is evolutionarily unrelated to kinesin, is much less well understood. In this talk, I will discuss our recent efforts to understand how structural changes in the dynein motor produce motility and how the motility of dynein might be regulated.



RONALD D. VALE, Ph.D.

**PROFESSOR AND VICE-CHAIR, DEPARTMENT
OF CELLULAR AND MOLECULAR PHARMACOLOGY
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO**

**INVESTIGATOR, HOWARD HUGHES MEDICAL
INSTITUTE**

Ronald D. Vale is a Professor in the Dept. of Cellular and Molecular Pharmacology at UCSF, where he also serves as Vice-Chair, and is an Investigator in the Howard Hughes Medical Institute. Dr. Vale received his Ph.D. in Neurosciences from Stanford University in 1985 where he trained with Dr. Eric Shooter. He was a Staff Fellow with the N.I.H. stationed at the Marine Biological Laboratory in 1985–6 and began his faculty appointment at UCSF in 1987.

Dr. Vale's main research focus has been understanding molecular motor proteins and their role in transporting materials within cells. As a graduate student, Vale, along with colleagues Schnapp, Reese and Sheetz, discovered a new type of molecule motor, which he christened "kinesin." As a faculty member at UCSF, Dr. Vale and his laboratory, using structural approaches in combination with new microscopic methods for tracking single protein molecules, developed a detailed model of how kinesins generates motion. More recently, Dr. Vale has focused on dynein, a microtubule motor that remains less well understood than the kinesins. His laboratory also investigates the assembly of the mitotic spindle and the mechanism of T cell signaling.

Vale is involved in several activities that benefit the scientific community. He founded iBiology.Org, a project that produces videos of scientific talks by leading scientists and makes them freely available to students and scientists throughout the world. He founded IndiaBioscience.Org, a web site for the life sciences in India, and also started the annual Young Investigator Meeting for young Indian scientists. He previously co-directed the MBL Physiology Course for five years and founded/

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* Chair of Cell Biology (1985–2000), Emeritus Director,
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**Chair of Cell Biology (2002–2012), Associate Vice Chancellor Research,
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+ Department of Cancer Biology, VUMC

^ Department of Pathology, Microbiology and Immunology VUMC

Deceased