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Hosted by Dr Cynthia He

Intracellular Etiquette and the Systems Biology of Host-Pathogen Interactions

About the speaker:

David S. Roos is the E. Otis Kendall Professor of Biology at the University of Pennsylvania, and was the Founding Director of the University of Pennsylvania Genomics Institute (now the Penn Genome Frontiers Institute). He earned his undergraduate degree at Harvard College, a PhD at The Rockefeller University, and joined the University of Pennsylvania in 1989 after a post-doctoral stint at Stanford University. Professor Roos' research integrates diverse disciplines, ranging from molecular genetics and cell biology, to biochemistry and pharmacology, to computer science and genomics, to immunology and international public health. Current interests focus on protozoan parasites, including *Toxoplasma* (a prominent congenital pathogen and opportunistic infection associated with AIDS), and *Plasmodium* (the causative agent of malaria). Work in the Roos laboratory has yielded genetic tools for the molecular dissection of parasite pathogenesis and drug resistance mechanisms, new insights into the function and evolution of subcellular organelles (including novel therapeutic targets), and computational resources designed to ensure that genomic-scale datasets are readily accessible to scientists worldwide. Professor Roos directs the Eukaryotic Pathogen Genome Database (EuPathDB.org), an on-line resource used daily by many thousands of researchers. He has received various honors, including the Presidential Young Investigator Award from the National Science Foundation, the Burroughs Wellcome Scholar Award, the Ellison Medical Foundation Senior Scholar Award in Global Infectious Diseases, a Merit Award from the National Institutes of Health, and election to the American Academy of Microbiology. He has published 200+ research reports in leading scientific journals, and travels widely as a lecturer and consultant for the WHO and other organizations. Professor Roos is strongly committed to education, having trained more than 25 doctoral students and 50 post-doctoral fellows, taught Introductory Biology and Cell Biology courses to undergraduates for decades, and organized workshops in Bioinformatics and Cell Biology at many sites throughout the world.



David S. Roos

University of Pennsylvania, Philadelphia PA USA

Eukaryotes display a spectacular range of cell biological diversity -- far greater than commonly appreciated from more familiar animal, fungal and plant systems. The phylum apicomplexa encompasses thousands of species, including clinically significant pathogens such as *Plasmodium* and *Toxoplasma*, and molecular genetic, cell biological, genomic, and systems-level analysis of these organisms provides a fascinating window into evolutionary diversity and the biology of host-pathogen interactions. Conserved features elucidate common attributes of eukaryotic life, while unique elements highlight organismal diversity ... and identify targets for therapeutic intervention. Moreover, as obligate intracellular pathogens, the apicomplexa have evolved specific mechanisms for co-opting their host cells -- and host cells exhibit diverse mechanisms for parasite regulation -- providing perspectives on cell-cell interactions that are readily amenable to high-throughput cell-based screening assays and genomic / systems biological studies