Department of Biomedical Engineering
UNIVERSITY OF WISCONSIN–MADISON

Fall 2025
Seminar Series

Fantastic forces and where to find them

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Molecular Biophysics and Biochemistry, and of Cell Biology
School of Medicine
Yale University

Mechanical forces are central to countless biological processes in health and disease. However, despite their ubiquity and importance in cellular processes, our understanding of biomechanical forces lags far behind our understanding of the underlying biochemistry. Studying forces within cells is difficult because tools and approaches to directly probe forces at the molecular level are scarce, difficult to use or have limited applications. In this seminar, I will present approaches based on quantitative microscopy, mathematical modeling and molecular force sensor engineering that my lab has developed to readily measure biophysical quantities so far impossible or difficult to measure in vivo. Using clathrin-mediated endocytosis as a model system, I will show how these methods have uncovered new molecular mechanisms of force production, force transmission and force sensing by the actin cytoskeleton.

ABOUT the SPEAKER

Julien Berro, PhD, is an Associate Professor of Molecular Biophysics and Biochemistry, and of Cell Biology at Yale University. He initially trained in Physics, Applied Mathematics and Computer Sciences at the Institut National Polytechnique de Grenoble, France. He obtained his PhD in Mathematical Modeling in Biology at Université Joseph Fourier, Grenoble, France, and trained in experimental quantitative cell biology during his postdoc at Yale University. His lab studies the mechanobiology of the actin cytoskeleton with a focus on clathrin-mediated endocytosis and cytokinesis. The lab is currently developing new force sensors and synthetic mechano-transduction tools for discovery research and therapeutics development.

Monday, November 24 at Noon
1003 Engineering Centers (Tong Auditorium)