**Prof. Yale E. Goldman** is Professor of Physiology at University of Pennsylvania. He obtained the Bachelor of Science in Electrical Engineering from Northwestern University in 1969 and MD and PhD in Physiology from the University of Pennsylvania in 1975. He was a Muscular Dystrophy Association Post-Doctoral Fellow at University College London from 1975, and joined the University of Pennsylvania faculty in 1980. He has had a long-standing interest in muscle contraction, molecular motors, protein synthesis, advanced optical microscopy and single molecule biophysics. He has developed and applied novel biophysical techniques to these studies, leading to a number of novel research findings. New techniques have included laser photolysis of caged ATP, white light optical diffraction, stable isotope oxygen exchange, polarized total internal fluorescence microscopy for single molecule structural dynamics, high speed optical traps, “parallax view” 3D tracking, and alternating laser excitation (ALEX) microscopy for single molecule FRET measurements. He has trained many successful scientists.

**Title: Ultra-Fast Single Molecule Mechanics Resolves the Earliest Events in Force Generation by Cardiac Myosin**

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Key steps of cardiac mechanochemistry, including force generation via a working stroke and the release of phosphate (Pi), occur rapidly after myosin attaches to actin. An ultra-high-speed, optical trap technique enabled direct observation of the timing and amplitude of the working stroke, showing the stroke can occur within <200 ms of actin binding by b-cardiac myosin. This time resolution is compared to standard optical traps which give binding time uncertainties greater than several milliseconds. The initial actomyosin state in the short period before the working stroke can sustain loads up to at least 4.5 pN and either proceeds directly to the stroke or detaches without binding ATP. The partition between these two steps is force sensitive leading to an apparent force dependence of the working stroke amplitude.