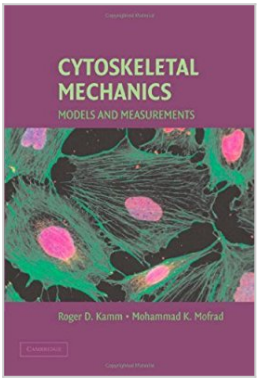

Cytoskeletal Mechanics: Models and Measurements in Cell Mechanics (Cambridge Texts in Biomedical Engineering)

By Mohammad R. K. Mofrad

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This 2006 book presents a full spectrum of views on current approaches to modeling cell mechanics. The authors come from the biophysics, bioengineering and physical chemistry communities and each joins the discussion with a unique perspective on biological systems. Consequently, the approaches range from finite element methods commonly used in continuum mechanics to models of the cytoskeleton as a cross-linked polymer network to models of glassy materials and gels. Studies reflect both the static, instantaneous nature of the structure, as well as its dynamic nature due to polymerization and the full array of biological processes. While it is unlikely that a single unifying approach will evolve from this diversity, it is the hope that a better appreciation of the various perspectives will lead to a highly coordinated approach to exploring the essential problems and better discussions among investigators with differing views.

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Editorial Review

About the Author
Dr Mohammad Reza Kaazempur Mofrad is an Assistant Professor at the University of California, Berkeley's Department of Bioengineering. His research at the Mofrad Laboratory is focused around understanding the principles underlying cellular mechanics, rheology and mechanotransduction, as well as the multiscale biomechanical processes underlying cardiovascular tissue mechanotransduction involved in diseases like aortic valve calcification and arterial atherosclerosis. Before joining the faculty at Berkeley, Dr Mofrad was a Principal Research Scientist at MIT for nearly two years. He is the recipient of the Partner in Excellence Award from Partners HealthCare System, Massachusetts General Hospital. He is also the co-editor of Cellular Mechanotransduction.

Roger D. Kamm has been on the faculty at MIT since receiving his Ph.D. in 1977 and now holds a joint appointment in the Biological Engineering and Mechanical Engineering Departments. Current research activities in the Kamm Laboratory at MIT include tissue engineering and microfluidics, cellular rheology and molecular mechanics. He is currently the Chair of the U.S. National Committee on Biomechanics and the World Council on Biomechanics and he is Director of the Global Enterprise for MicroMechanics and Molecular Medicine. Kamm has a long-standing interest in bioengineering education, directs a NIH-funded biomechanics training program, co-chaired the committee to form MIT's new undergraduate major in biological engineering and helped to develop MIT's course on molecular, cellular and tissue biomechanics.

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