

This book presents a full spectrum of views on current approaches to modeling cell mechanics. The authors of this book 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 our 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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Cover photograph courtesy of Dr. Jan Lammerding. Mouse embryo fibroblasts stained to label F-actin (green) and DNA (magenta).

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