MS2I_10709

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Molecular Mechanics of Cytoskeletal Components

Christoph F. Schmidt[(1)], M. Atakhorrami[(1)], K. Addas[(2)], G.H. Koenderinck[(1)], F.C. MacKintosh[(1)], J.X. Tang[(3)]

(1) *Vrije Universiteit Amsterdam, Dept. Phys., Amsterdam, Netherlands*
(2) *Indiana University, Dept. Phys., Bloomington, IN, USA*
(3) *Brown University, Dept. Phys., Providence, RI, USA*

The dynamics of cells are governed by polymeric structural materials, forming the cell membrane or attached to it, or making up the cell-internal cytoskeleton. Molecules involved are polymeric sugars, lipid membranes and protein polymers. The cytoskeleton is largely made up of linear protein polymers of three types, microtubules, actin filaments and intermediate filaments. These filaments have in common that they are rather rigid on the scale of a typical cell and can be modeled as semiflexible polymers. The dynamics of individual filaments and of networks of such filaments is not well described by conventional (flexible) polymer theory. I will here sketch the peculiar properties of semiflexible polymers and their solutions and networks and will present experimental results from microscopic measurements of viscoelastic parameters of such systems. Much of the data will be from microrheology experiments, a method for dynamically probing viscoelastic properties on a micron scale.
ABIOMED guest

View the extended summary