



From Isolated Filaments and Filamentous Bundles to Active MT Gels

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Abstract:

The cytoskeleton has a number of highly unusual material properties which are essential for the reproduction and survival of the cell. However, the extraordinary structural complexity of the cytoskeleton, which contains hundreds of different proteins, presents a particular challenge to any study of its material properties. I will outline experiments whose goal is to reconstitute certain material properties of the cytoskeleton using a few well-defined biochemical components. The long term goal is to understand the behavior of resulting materials at all levels of hierarchy. For this reason, I will first describe experiments that probe the behavior of equilibrium filamentous bundles and their dependence on the properties of constituent filaments and their interactions. Subsequently, I will describe dynamical behavior of isolated bundles and percolating gels observed upon addition of molecular motors which drive the system into highly out of equilibrium steady states.

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