

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Probing the sliding interactions between bundled actin filaments**

ANDY WARD, ZVONIMIR DOGIC, Brandeis University — Assemblies of filamentous biopolymers are hierarchical materials in which the properties of the overall assemblage are determined by structure and interactions between constituent particles at all hierarchical levels. For example, the overall bending rigidity of a two bundled filaments greatly depends on the bending rigidity of, and the adhesion strength between individual filaments. However, another property of importance is the ability for the filaments to slide freely against one another. Everyday experience indicates that it is much easier to bend a stack of papers in which individual sheets freely slide past each other than the same stack of papers in which all the sheets are irreversibly glued together. Similarly, in filamentous structures the ability for local re-arrangement is of the utmost importance in determining the properties of the structures observed. In order to study this phenomenon we create bundles of biopolymers by inducing attractive interactions between actin filaments via the depletion mechanism. We find that bundles of actin filaments do not slide freely across one another. In order to characterize these sliding interactions, we perform active experiments using laser tweezers to pull one filament across the other at constant velocity.

Andy Ward  
Brandeis University

Date submitted: 28 Nov 2010

Electronic form version 1.4