Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Mechanics of Lamellipodia D. A. QUINT, J. M. SCHWARZ, Syracuse University — The actin cytoskeleton is a morphologically-complex assembly of cross-linked F-actin filaments. The cytoskeleton provides rigidity for the cell within appropriate time scales so that it can change its shape to, for example, crawl along surfaces. In addition to cross-linking proteins, many other proteins are involved in the assembly of the actin cytoskeleton such as branching proteins, capping proteins, and severing proteins. Presumably these proteins work cooperatively toward the dynamic formation of rigidity. We will initially focus on the role of branching proteins. The F-actin filaments in lamellipodia—protrusions of the mobile edge of a crawling cell—have some overall orientation due to the branching. Branched filaments emerge at a 70 degree angle from the mother filament's growing end.[1] This overall orientation is modelled as an anisotropy in an effective medium theory determining the cytoskeleton's elasticity in the static regime. The potential for a splay rigid phase, in addition to a rigid phase, is also investigated.
[1]T. M. Svitkina and G. G. Borisy, *J. Cell Biol.* **145**, 1009 (1999).

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Date submitted: 27 Nov 2007 Electronic form version 1.4