## Abstract Submitted for the MAR13 Meeting of The American Physical Society

Rheology of rigid rod – flexible chain composite networks MEENAKSHI PRABHUNE, Third Institute of Physics - Biophysics, Georg August University, Göttingen, KNUT HEIDEMANN, Department for Numerical and Applied Mathematics, Georg August University, Göttingen, FLORIAN REHFELDT, Third Institute of Physics - Biophysics, Georg August University, Göttingen, MAX WARDETZKY, Department for Numerical and Applied Mathematics, Georg August University, Göttingen, CHRISTOPH SCHMIDT, Third Institute of Physics - Biophysics, Georg August University, Göttingen — Living cells are governed by active cellular processes such as cell division, adhesion and migration that depend on the cytoskeleton. The cytoskeleton is a composite cross-linked polymer network of cytoskeletal filaments ranging from rod-like microtubules and actin bundles to semi-flexible actin filaments and softer intermediate filaments. Single-component in vitro networks have been studied, but well defined composites are more difficult to construct and are not yet well understood. Here, we have generated heterogeneous networks *in vitro* by cross-linking microtubules and ds DNA via a heterobifunctional cross-linker (sulpho SMCC). DNA as a cross-linker has the unique advantage of having a well-defined length, which we vary in our experiments. We have measured the shear-elastic response in these networks by macrorheology experiments at varying strains and frequencies. The nonlinear response was also characterized using differential stiffness measurements in a macrorheometer. Simultaneously, we compare the experimental data to numerical simulations that we have developed for networks of stiff slender rods connected by semi-flexible linkers (see talk by Knut Heidemann).

> Meenakshi Prabhune None

Date submitted: 09 Nov 2012

Electronic form version 1.4