

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Effects of dilution on elastohydrodynamic coating flow of an anti-HIV microbicide vehicle¹ ANDREW SZERI, SU CHAN PARK, SAVAS TASOGLU, Department of Mechanical Engineering, UC Berkeley, DAVID F. KATZ, Department of Biomedical Engineering and Department of Obstetrics and Gynecology, Duke University — Elastohydrodynamic lubrication over soft substrates characterizes the drug delivery of anti-HIV topical microbicides carried in gel vehicles. These gels are under development to prevent HIV transmission into vulnerable vaginal mucosa during intercourse. Their effectiveness depends on completeness and durability of coating, as well as on the active ingredients. Here we investigate the influence of dilution by vaginal fluid on the coating flows that serve to protect the user. The effects of dilution by vaginal fluid simulant are assessed through rheological experiments at variable dilution of the gel vehicle. This involves determination of the way parameters in a Carreau model of a shear-thinning gel are modified by dilution. The changes in coating are determined from a computational model, based on dilution rheology measured in the laboratory. The elastohydrodynamic lubrication model of Szeri, et al. *Physics of Fluids* (2008) is supplemented with a convective-diffusive transport equation to handle dilution, and solved using a multi-step scheme in a moving domain.

¹Work supported by the California HIV/AIDS Research Program.

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Date submitted: 07 Aug 2009

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