Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Osmolarity as a contributing factor in topical drug delivery CLAIRE FUNKE, UC Berkeley, ANDREW J. SZERI, University of British Columbia — Gels and dissolvable solids are drug delivery platforms being evaluated for application of active pharmaceutical ingredients, termed microbicides, which act topically against infection by sexually transmitted HIV. In previous work, we have investigated how dilution by naturally produced fluid from the vaginal mucosa affects drug transport into the vaginal wall. We expand on this work by no longer assuming a constant flux and instead developing a relation for fluid transport based on osmolarity – thus allowing fluid to pass both into and out of epithelial cells. This relation shows that varying the osmolarity of the applied solution can have a significant effect on the amount of drug delivered to its target while holding the applied amount constant. This effect is modulated by a dimensionless group that relates the rates of solute and solvent transport. Ultimately, our goal is to develop a tool to understand better how to manipulate solution osmolarity in order to improve drug delivery within safety parameters for mucosal tissue.

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Date submitted: 01 Aug 2017 Electronic form version 1.4