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Model for inter-epithelial flow of an anti-HIV microbicidal drug delivery formulation[1] ANDREW SZERI, AARON WEISS, University of California, Berkeley, DAVID KATZ, Duke University — We consider the spreading characteristics of a Newtonian and a non-Newtonian fluid between compliant surfaces. This is a model for inter-epithelial flow of an anti-HIV microbicidal drug delivery formulation. Squeezing and gravity drive the flow. Owing to the large shear viscosity and narrow flow domain with compliant walls, the problem is an application of elastohydrodynamic lubrication theory. Dimensional analysis and numerical simulation reveal the influence of shear viscosity, wall compliance, longitudinal pressure gradient, formulation volume and channel dimensions on the area coated by the formulation. This area is a function of: (i) a dimensionless parameter which measures the relative importance of gravity-driven and compliance-driven flows, and (ii) time made dimensionless by the compliance and the shear viscosity. The coated area is of central importance in the functioning and evaluation of candidate microbicide delivery systems.

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Andrew Szeri
University of California, Berkeley

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