

Abstract for an Invited Paper  
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**The Role of Surfactant Dynamics on Tipstreaming in Planar Flow Focusing<sup>1</sup>**

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We have previously shown that tipstreaming occurs in microfluidic flow focusing experiments when soluble surfactants are present in the internal liquid phase. While we have characterized the conditions under which the process occurs in terms of the capillary number, flow rate ratio, viscosity ratio, and other geometric parameters for the device, the role of the surfactant molecular properties in the process is not clear. In this talk, we vary the characteristic timescales for transport of surfactant to and along the interface by considering ionic and nonionic surfactants with varying charge, tail length, and critical micelle concentration. We find that the process is robust in that many different surfactants will promote tipstreaming. We organize our observations of the thread length and diameter as well as the range of flow conditions in which tipstreaming occurs in terms of dimensionless parameters including the capillary number, Peclet number, and Biot numbers.

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