Migration and fractionation of soft deformable particles in microchannels

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Soft deformable particles are found in many things we eat, use, and are made of, including examples such as blood cells and polymers. On the length / diffusion time scale of micron-sized particles, entropy, elasticity, particle structure, van der Waals, and electrostatic interactions all strongly influence particle shape and dynamics. In fluid flow, the rich conformation and dynamics of these particles can be exploited to manipulate fluid rheology. Using mesoscopic simulation methods, we investigate how the particle deformability affects flow and vice versa. I will discuss similarities between the flow behavior of different classes of deformable particles – from string-like polymers to elastic capsules, and applying this knowledge for particle flow fractionation in microfluidics.

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