

Abstract Submitted
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Constrained droplets for high resolution microscopy of protein fibrillization DAVID POSADA, PETER TESSIER, AMIR HIRSA, Rensselaer Polytechnic Institute — The use of constrained droplets (droplets with pinned contact lines on solid surfaces) is proposed here as a method for sample support in optical microscopy studies. Capillarity acts to contain the liquid sample, allowing access for observations in the bulk and at the gas/liquid interface. At the capillary length scale, surface tension forms stable interfaces, virtually immune to gravity and with curvatures that can be adjusted. This is particularly useful when studying the gas/liquid interface and its vicinity under high resolution optical microscopy. Such observations are normally performed using oil immersion objectives which must be positioned within distances only tens of microns from the region of interest. Constrained droplets can also be used at small scales, requiring minute volumes of analyte. The use of the constrained droplet method is demonstrated by studying the aggregation of insulin into amyloid fibrils in the solution and at the gas/liquid interface, where proteins are prone to denaturation and subsequent fibrillization. Such an aggregation process is associated with many neurodegenerative diseases, including Alzheimer's.

Amir Hirsa
Rensselaer Polytechnic Institute

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