

Abstract Submitted
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Fibrillization kinetics of insulin solution in an interfacial shearing flow¹ VIGNESH BALARAJ, SAMANTHA MCBRIDE, AMIR HIRSA, Rensselaer Polytechnic Institute, JUAN LOPEZ, Arizona State University — Although the association of fibril plaques with neurodegenerative diseases like Alzheimer's and Parkinson's is well established, in-depth understanding of the roles played by various physical factors in seeding and growth of fibrils is far from well known. Of the numerous factors affecting this complex phenomenon, the effect of fluid flow and shear at interfaces is paramount as it is ubiquitous and the most varying factor in vivo. Many amyloidogenic proteins have been found to denature upon contact at hydrophobic interfaces due to the self-assembling nature of protein in its monomeric state. Here, fibrillization kinetics of insulin solution is studied in an interfacial shearing flow. The transient surface rheological response of the insulin solution to the flow and its effect on the bulk fibrillization process has been quantified. Minute differences in hydrophobic characteristics between two variants of insulin- Human recombinant and Bovine insulin are found to result in very different responses. Results presented will be in the form of fibrillization assays, images of fibril plaques formed, and changes in surface rheological properties of the insulin solution. The interfacial velocity field, measured from images (via Brewster Angle Microscopy), is compared with computations.

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