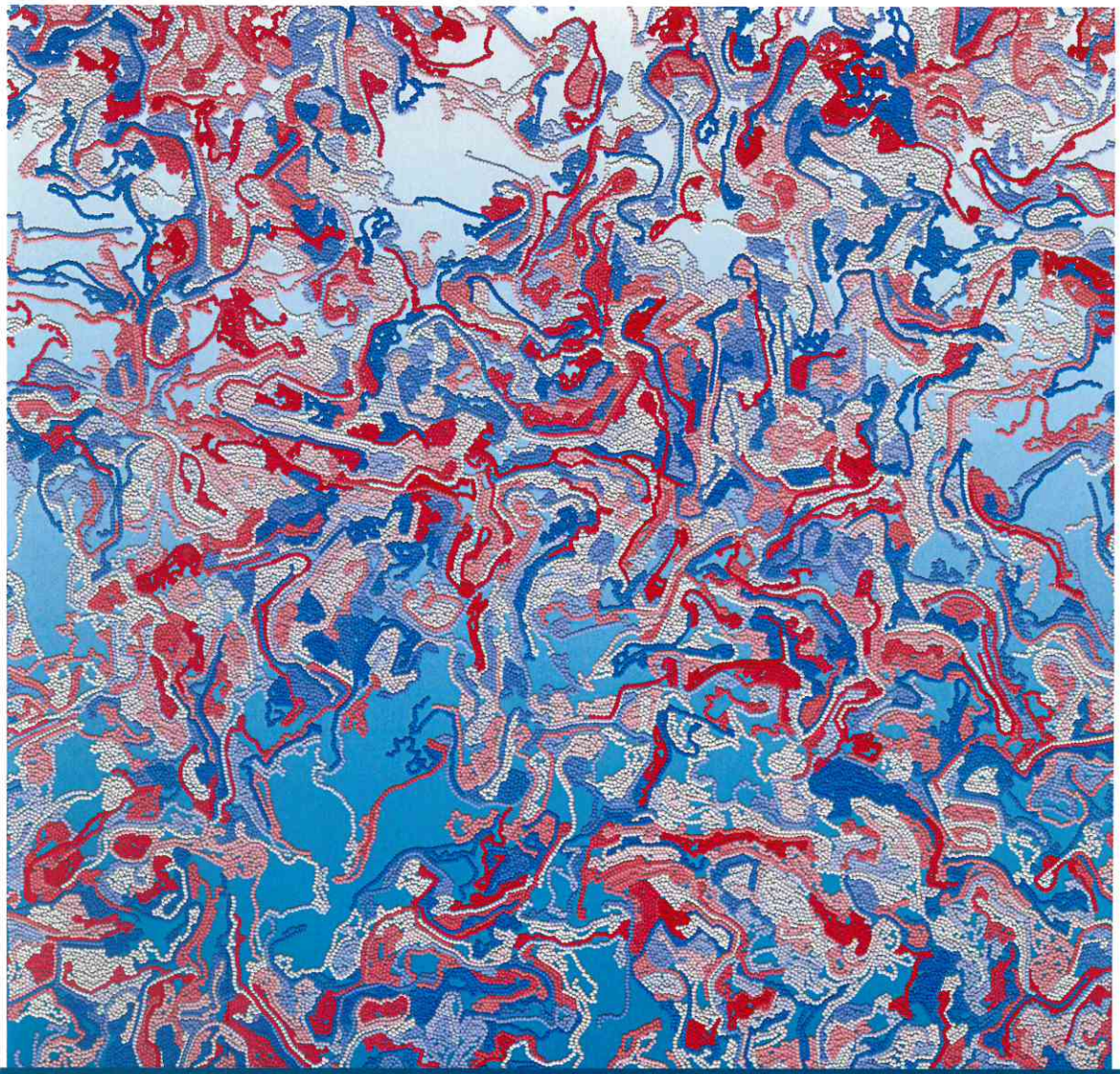

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rush polymers: from dilute solutions to super-soft rubbers

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es are polymers consisting of linear backbones with densely grafted polymeric Recent progress in polymerization methodologies enables controlled synthesis of hed macromolecules. Polymer bottlebrushes provide intriguing features being h in nature and in synthetic systems. While their presence in the articular cartilage ynovial joint lubrication, bottlebrushes offer pathways for fascinating applications, hin super-soft elastomers or for drug delivery. However, the current theoretical ng of bottlebrush properties in solutions lacks completeness. The major difficulty play between many length scales in the bottlebrush structure. During the talk iodel of bottlebrush polymers will be presented. The model applies to solutions n dilute concentrations to dense melts. The validity of the model is supported by xtensive molecular dynamics simulations. We demonstrate that the hierarchical bottlebrushes dictates a sequence of conformational changes as the solution n increases. The effect is mediated by screening of excluded volume interactions nt structural parts of the bottlebrushes. Our findings provide important insights enable improved customization of novel materials based on the architectural lymer bottlebrushes.

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The role of *in vitro* fibrinogen glycation on FXIII-induced crosslinking and shear flow clot response

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Glycation of fibrinogen, and subsequently fibrin, is a natural process taking place under normal physiological conditions and giving rise to fibrin networks with characteristic structural and mechanical properties. However, excess glycation and the accompanied elevated levels of fibrinogen, as observed in diabetes states, yield formation of modified fibrin clots with more compact and difficult to lyse structure. One possible mechanism underlying these differences may be related to a modified rigidity of individual fibrin fibers resulting from altered FXIII-induced α- and γ-chain crosslinking. Using biochemical tools (SDS-gel and ELISA analysis) we investigate the effect of fibrinogen glycation on FXIII-induced crosslinking. Our preliminary results reveal that fully crosslinked fibrin networks show similar pattern of ligation, regardless of the presence or absence of glycation. Surprisingly however, in FXIII-inhibited glycated fibrin networks, the level of α- and γ-chain crosslinking for a given inhibitor concentration is reduced as compared to control clots, suggesting formation of weaker covalent bonds upon glycation. Thus, glycation of fibrinogen prior to polymerization can interfere with covalent bond formation, altering the stability of fibrin fibers. Interestingly, under shear force application glycated fibrin networks experience shear-dependent network reorganization with individual filaments first aligning within the flow direction and next reorienting under 45^0 angle.