



Massachusetts Institute of Technology

Postdoc position available at MIT / Hierarchical nanomechanics of amyloid protein materials

A postdoctoral associate position at MIT is available immediately, focused on elucidating the fundamental material science concepts that control the formation, behavior and in particular mechanical failure and fracture of fibrous amyloid protein materials. Amyloids form pathogens in diseases (Alzheimer's, Parkinson's), play a role in defining the properties of spider silk, and are found in many natural adhesives. These beta-sheet rich protein structures constitute an intriguing class of protein materials that self-assemble at room temperature to form characteristic hierarchical nanostructures and fibers, which combine exceptional strength and sturdiness, elasticity with bioactivity and the ability to self-heal.

This project includes carrying out large-scale atomistic and mesoscale predictive multi-scale simulations on supercomputing facilities. Particular focus of this project is the understanding of structure-property links of amyloid-based structures, including self-assembly processes and catastrophic structural failure. Computational techniques will be combined with approaches from structural mechanics, biophysics, statistical mechanics and biochemistry to provide quantitative prediction of the properties of amyloidogenic protein structures and amyloid fibrils throughout vast ranges of time- and length-scales. A Ph.D. in engineering, chemistry, biology or a related field is required. The candidate should have well-developed computational skills, a strong background and interest in atomistic, molecular and multi-scale modeling and simulation, and preferably experience with statistical mechanics and continuum approaches. Expertise in the biological field is preferred. Good written and verbal communication skills and organizational talents are a required.

Please send a CV, a summary of research interests and skills, three representative publications, and the names, affiliations, phone numbers, and email addresses of three references to lamm-search@MIT.EDU. The research will be carried out at MIT's Laboratory for Atomistic and Molecular Mechanics.

For any questions, please contact Markus Buehler (contact information below).

Contact information:

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