

The Department of Chemical Engineering Presents:



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Molecular engineering & design at the bio/nano interface

Wednesday, September 23, 2020 3:25PM via Zoom:

<https://rochester.zoom.us/j/98875611576?pwd=RHY3bmhrRFZEMGhiUW5wZ0VlaDNuUT09>

Abstract: Determining the orientation and conformation of an adsorbed biomolecule at an inorganic interface remains a grand challenge in studies of interest to materials science, medicine and biotechnology. Lack of a general approach, either computational or experimental, to study structure thermodynamics and kinetics of the bio/nano interface, advances in the field are often left to chance discovery vs detailed mechanistic understanding. Throughout this seminar I will present recent advances from our group in fundamental science and engineering of interfacial phenomena of complex peptides alongside recent studies that explore thermodynamic driving forces in folding of a special class of biomimetic polymers.

The talk will present computational methods for determining the structure and thermodynamics of a surface-bound peptide, experimental validation of the accuracy of the methods, and a series of examples of increasing complexity including titania binding peptides, proteins involved in the mineralization of bone and integration of implants, and synthetic biomolecules that are used to create hybrid bio/nano structures for hierarchical and multifunctional materials.

Bio: Jim Pfaendtner is the Rogel Professor & Chair of Chemical Engineering and Professor of Chemistry at the University of Washington and Staff Scientist at Pacific Northwest National Laboratory. He holds a B.S. in Chemical Engineering (Georgia Tech, 2001) and a PhD in Chemical Engineering (Northwestern University, 2007). He also serves as Associate Vice Provost for Research Computing at the UW. Jim's research focus is computational molecular science and his recent teaching interests are in the area of teaching data science skills.