

Join us for a Special Seminar at BioSyM!
Thursday, 24 July 2014 at 4pm
CREATE Enterprise Level 5 (Perseverance Room)

Making Coiled-Coils Play New Tricks: Tough, Extensible, Responsive and Bioselective Gels

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Artificially engineered protein hydrogels provide an attractive platform for biomedical materials due to their similarity to components of the native extracellular matrix and ability to be easily biofunctionalized to promote desired cellular responses. This talk will discuss three engineering design concepts in protein hydrogels that can be exploited to improve their mechanical performance: hierarchical structuring, topological entanglement, and chain folding/aggregation. Using these strategies, we demonstrate the ability to produce stiff, tough, adhesive, and extensible gels, and also to modulate all of these advanced mechanical properties in response to stimuli such as temperature or mild oxidation. Theories of polymer physics can be applied to explain the structural and molecular origins of the mechanical response. Finally, we show that the incorporation of biofunctional protein sequences into such artificial gels can recapture the biological specificity and interactions of the nuclear pore gel.