

Introductory Talks by New Researchers @ BioSyM

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Engineering of Biomimetic Materials Inspired by Jumbo Squid Sucker Ring Teeth

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Date: 14th November 2016, Monday

Time: 12 pm to 1 pm

Venue: Perseverance Room, Enterprise Level 5



Abstract

Nature is providing many examples for bio-inspired engineering and increasingly does so at the molecular level. A broad spectrum of sophisticated biological materials are being investigated for the development of environmentally benign routes to synthesize novel materials. Particularly, a mechanically outstanding biological material, the sucker ring teeth (SRT) of jumbo squid (*Dosidicus gigas*) are devoid of any minerals, chitins, or covalent crosslinks. In contrast, they are completely composed of proteins which self-assemble into a supermolecular network reinforced by β -sheet structures. In this project, SRT were characterized for their chemical-mechanical and thermomechanical properties to further identify the underlying principles that direct the formation of such strong and unique materials. Exploiting these information and previous findings, native and recombinantly expressed SRT proteins were fabricated into a wide range of materials, including nanoparticles, hydrogels, thin films and fibers. These materials displayed interesting drug/gene loading capacity and mechanical tunability, thus opening an wide avenue in biomedical applications, for example drug delivery and tissue engineering.

Short Biography

Dawei joined SMART-BioSyM in August 2016 as a postdoctoral associate in Prof. Doyle's group. He has recently graduated from the School of Material Science and Engineering at Nanyang Technological University, Singapore. His research interests include the engineering and characterization of biomaterials with biocompatible polymers and proteins, and exploring their applications in biomedical fields, especially in drug delivery systems.