



The Department of Molecular, Cellular and Developmental Biology Seminar Series Presents



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“Phase-dependent Redox-insulation of Adhesive Proteins”

Water commonly subverts adhesive performance, and this is well understood in terms of the effect of hydration on interfacial energies. To the extent that the interfacial ingress of moisture is responsible for much adhesive bond deterioration, clean-room technology today is capable of engineering moisture-resistant covalent bonds between an adhesive and an underlying solid surface, though at considerable effort and expense. In contrast, the technology for adhering to surfaces underwater or in chemically-hostile environments is much more limited, yet these limitations do not appear to restrict the wet adhesion of marine organisms. Mussels, for example, routinely stick to all kinds of surfaces underwater using complex fluids that spread spontaneously and exhibit strong reversible interfacial bonding and tunable cross-linking. Similarly, the sandcastle worm secretes microdroplets of adhesive to build a tube-like burrow from sand grains and other particles. The development of a complete, molecular-based understanding of bio-adhesion and its translation to synthetic systems would not only significantly impact moisture-limited performance of current adhesives and coatings but open up new avenues of materials research in biomedical implants/coatings, infiltration-processed composites, and hydrocolloid clay-based nanocomposites.

Wednesday, May 27, 2020

4:00pm via Zoom: <https://yale.zoom.us/j/97190232202>; Or Telephone : 203-432-9666 (2-ZOOM if on-campus) or 646 568 7788; Meeting ID: 971 9023 2202

Hosted by: Jing Yan

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