

BiophysTO Lunchtime Talks

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The Hospital for Sick Children

Tracking the structure and dynamics of elastin-like polypeptides through a liquid-liquid phase separation (and beyond) using NMR spectroscopy

The liquid-liquid phase separation of proteins, resulting in the formation of dynamic and responsive droplets, is becoming rapidly recognized as an important process underlying many critical aspects of biology. However, the mechanisms through which proteins of differing sequence, structure and function are able to undergo a phase transition in response to environmental stimuli are not well understood. It is of particular interest to develop an atomistic understanding of the structural and dynamic changes involved in forming a phase separated protein-rich state. In the case of elastin, phase separation (coacervation) occurs in response to salt and heat, and is an essential step in formation of the elastic fibre. We have designed a set of elastin-like polypeptides (ELPs) that accurately mimic the assembly and mechanical properties of tropoelastin and that are ideally suited for detailed structural analysis using NMR spectroscopy. Using a combination of solution and solid state NMR spectroscopy, we have been able to directly observe protein structure and dynamics across the phase transition - from soluble monomer to coacervated protein and into crosslinked elastomeric materials - providing us with an unprecedented level of detail on the assembly process.

Host: Dr. Walid A. Houry

(Refreshments and pizza will be provided)

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Thursday, September 22, 2016 – 12:00 pm, noon
McLennan Physical Laboratories, Room MP606
(and via streaming to DV3129 at UTM)