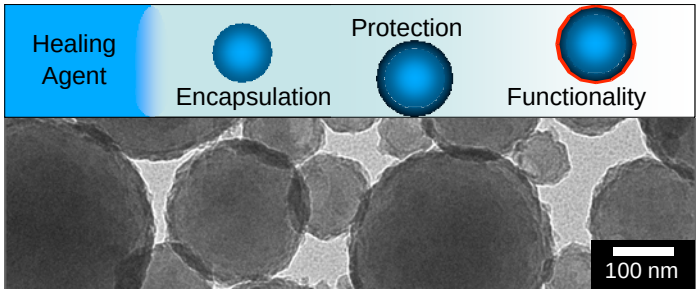
NANOHOUR

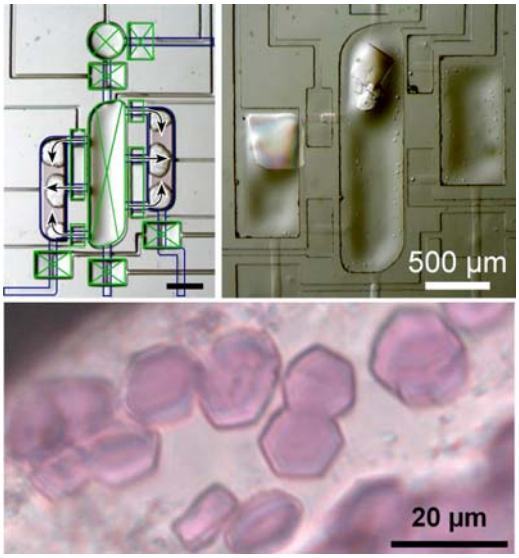
Wednesday, October 1, 2008
3:00 PM
Beckman Institute - Room 3269

Colloid Design for Self-Healing Materials
Aaron Jackson – Graduate Student, MatSE Department



Currently, self-healing materials are being developed that can retain their mechanical properties after damage. The key components of these materials are healing agents that are encapsulated and incorporated into a matrix. As a crack propagates through the matrix, these healing agents are released into the crack face. The healing agents then polymerize, healing the material. Looking into the future, new self-healing materials are being developed for these materials to be used in a variety of applications including high temperature applications, composites, and microelectronics. In this research, strategies for healing agent protection have been inspired by encapsulation, protection and functionalization technologies in the food industry, biomaterials, and other areas. Development of these methods will lead to exciting new self-healing materials that can retain electrical, optical, mechanical, and a variety of other properties.

Microfluidic Platforms for Membrane Protein Crystallization
Sarah Perry – Graduate Student, Chemical Engineering Department



Despite their critical role in many biological processes, the precise structure of a disproportionate number of membrane proteins is still unknown. Their limited availability and amphiphilic nature have seriously hampered both the identification of suitable crystallization conditions as well as the subsequent growth of X-ray quality crystals. We exploit microfluidics to facilitate the identification of suitable crystallization conditions on-chip using minute quantities of proteins on both traditional detergent solubilization (*in-surfo*) methods and the more novel *in-meso* approach. The *in-meso* approach represents a particularly novel achievement for microfluidics because a novel strategy was required in order to mix fluids at the microscale, where viscous effects are dominant, with viscosities that can differ by as much as five orders of magnitude. We demonstrate the effectiveness of the technique by crystallizing the membrane protein bacteriorhodopsin on chip.

Coffee and cookies will be served.

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