INCBN IGERT Seminar

Monday, 16 April 2007, 2:30 pm

Speaker: Jeff Brinker
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Directing Nanostructure Assembly with Living Cells

When lipid-directed assembly of silicic acid precursors is conducted in the presence of living cells, the cells intervene, surrounding themselves with a fluid, multilayered lipid vesicle that interfaces coherently with an ordered silica mesophase. This bio/nano interface is unique in that its uniform nanostructure prevents excessive drying of water maintaining cell viability, yet provides accessibility of the cell surface to small molecules. Compared to existing immobilization schemes like encapsulation within sol-gel matrices, we show this interface to form by an active interplay between the living cell and surrounding matrix, which we refer to as cell-directed assembly (CDA). Importantly, and perhaps uniquely, CDA creates a localized nanostructured microenvironment within which 3-dimensional chemical gradients are established and maintained.