

TITLE: From Molecules to Advanced Functional Materials via Self-Assembly

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ABSTRACT:

Self-assembly and self-organization processes offer a powerful strategy for the design of nanomaterials from the ground up with predefined dimensions and properties. Central to these approaches is the design and synthesis of molecules with a built-in ability to undergo a hierarchical sequence of supramolecular reactions, culminating with the formation of a well-defined functional superstructure. The rosette nanotubes (RNTs) are a new class of biocompatible organic nanomaterials with tunable dimensions and properties. RNTs are obtained through the hierarchical self-assembly of small synthetic organic molecules. They can be readily functionalized with bioactive molecules such as adhesive peptides, anti-cancer drugs, antibiotics, and other functional moieties. This lecture will focus on the design, synthesis and characterization of these materials and their applications in medicine and biomedical engineering.