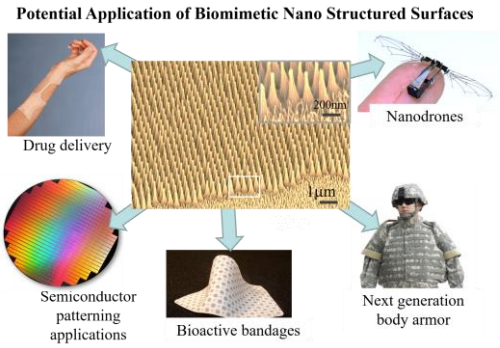
Bio-mimetic Multimodal Nanostructured Surfaces Fabricated with Self-Assembling Biopolymer and its Applications

Rakkiyappan Chandran[1]
[1] Triad Polymers LLC, NC -27409, USA

Composite surface topographies, control and determine the properties of insect cuticles. In some cases, these nanostructured materials are a direct extension of chitin-based cuticles. The cellular mechanisms that generate these structures are unknown and involve complex cellular and biochemical "bottom-up" processes. A synthetic "top-down" fabrication nanosphere lithography techniques can generates surfaces of chitin or chitosan that mimic the native nanostructures surface of certain insect wings and eyes. Biopolymer chitin and chitosan are flexible, biocompatible and abundant in nature. The fabrication of nanostructured chitin and chitosan materials could enable the development of new properties in biopolymeric materials. Also, the ability to generate a self-masking thin film and leads to synthesis and formation of metallic nanoparticles, enables a novel and powerful new tool for generating structured composite biomaterials. These crystalline metallic nanoparticles then served as seeds for the solid-state formation of nanowires within a drop-cast thin film by providing a flexible biopolymeric/metallic nanocomposite material. This information provides insight into the mechanisms that are essential for *in vitro* nanoscale manipulation of polymer in hydrogels and other synthetic biomaterials. The biomimetic nanostructured surfaces (NSS) formed through biopolymer scaffolds have potential applications for various defense and biomedical technologies.



Keywords—*Nano Cones, Biomimetics Self-assembly, Chitin Chitosan,*

Professional Biography

Rakkiyappan Chandran has completed his PhD from Joint School of Nanoscience and Nanoengineering (JSNN) at the University of North Carolina, Greensboro. Prior to his PhD, he did his joint master's degree project from Harvard Medical School at the Wellman centre for Photomedicine, Massachusetts General Hospital and further went on being a research assistant at MIT for a year. He then Joined Triad Polymers, as a Research and Development Scientist and is also a joint consortium member of JSNN. His current work focuses on formation of polymeric performance additives and apparels, non-woven fabrics, fine denier multifilament yarns, fabrication of polymeric biomaterials etc. He has published more than 20 papers in reputed international scientific and peer reviewed journals, with a book and 3

chapters on polymeric biomaterial and tissue engineering. He has been serving as an editorial member of repute journals and have attended enormous international conference and trade shows. Rakki, enjoy playing table tennis and watching soccer, and further enjoying good food, and live theatre. Finally, He always urges to develop advanced materials for various applications through scientific research and collaborations.



Email:rakki@triadpolymers.com