**Thomas H. LaBean, Ph.D.**

North Carolina State University

Department of Materials Science and Engineering.

"DNA Self-Assembly and DNA-Based Nanofabrication"

Abstract: DNA is well-known as the predominant chemical for duplication and storage of genetic information and has recently become important as an engineering material for construction of micron-scale objects with nanometer-scale feature resolution. Properly designed synthetic DNA can be used as programmable building blocks that will, via specific hybridization of complementary sequences, reliably self-organize to form desired structures and superstructures. Such engineered nanostructures can be used as templates and scaffolds for imposing specific patterns on various other materials (metals, oxides, carbon nanostructures, proteins, etc.). Given diverse mechanical, chemical, catalytic, and electronic properties of these specifically patterned heteromaterials, DNA self-assembly techniques hold great promise for bottom-up nanofabrication in wide ranging fields of technology. We will explore biomedical applications as well as the use of these materials for fabrication of nanoelectronic and nanophotonic devices.

Brief Bio: Thomas H. LaBean earned his PhD at the University of Pennsylvania in 1993. He studied the folding properties of unevolved, arbitrary-sequence proteins expressed by randomized, synthetic DNA libraries. He then moved to Duke University and studied de novo protein design, and then worked on DNA-based molecular computation systems. He now studies self-assembling biomolecular nanostructures as an Associate Professor in the Department of Materials Science and Engineering at North Carolina State University.