Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Supramolecular Lysophospholipid-Carbon Nanotube Complexes Enable Cellular Studies APPARAO RAO, YONNIE WU, JESSICA MOORE, PU-CHUN KE, Clemson University , LABORATORY OF SINGLE-MOLECULE BIOPHSYICS AND POLYMER PHYSICS TEAM, NANOMATERIALS LABORATORY TEAM, PROTEOMICS LABORATORY TEAM — Single walled carbon nanotubes (SWNTs) have found tremendous applications in electronics, nanophotonics, chemical and biosensing, and very recently, in nanomedicine. The bottleneck for many of these applications is the inherent insolubility of SWNTs due to their mutual interactions. Here we report that lysophospholipids, or single-chained phospholipids offer unprecedented solubility for SWNTs. The biocompatibility of lysophospholipids is unsurpassed since they occur naturally in the cell membrane. Using transmission electron microscopy we show lysophospholipids wrap SWNTs as striations whose size and regularity are affected by the polarity of the lysophospholipids. These findings shed light on the debate over the binding mechanism of amphiphilic polymers and cylindrical nanostructures and has implications on the design of novel supramolecular complexes and nanodevices. Since the head groups of lysophospholipids can be functionalized with tags such as quantum dots, antioxidants, and monoclonal antibodies, our method opens the door for utilizing nanomaterials for *in vivo* imaging, gene and drug therapy, and novel nanomedicine.

Pu-Chun Ke
Clemson University

Date submitted: 01 Dec 2005 Electronic form version 1.4