Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Nanotransforming Assemblies DENNIS DISCHER, YAN GENG, University of Pennsylvania — Degradable polymeric materials with hydrolysable backbones have attracted much attention because they break down to non-toxic metabolites. They are the key solutions to many environmental problems, and are particularly useful for various biomedical applications. Much work has been focused on degradable polymers and their co-polymers as bulk, or films and monolayers.[2] Only limited work has explored the degradable amphiphilic copolymer self-assemblies (spherical micelles, worm micelles and vesicles) in solutions, which are quite important for soft-material engineering. Mostly spherical micelles, and in rare cases, vesicles, have been reported made from copolymers with degradable polyester, typically polylactide or polycaprolactone, as the hydrophobic block, connected to biocompatible, stealthy poly (ethylene oxide) as hydrophilic block. Morphological change of such spherical micelles induced by degradation is subtle, and the degradation kinetics and mechanism in assemblies, which can be quite different from that in bulk or film, are not well understood. Here we will describe the phase transformations of worm micelles and vesicles as they degrade and also highlight how these polymeric self-assemblies interact with lipid membranes.

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Date submitted: 07 Dec 2004 Electronic form version 1.4