Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Controlling the Properties of Thermoreversible Protein Hydrogels[1] HUI YAN, ALBERTO SAIANI, ALINE MILLER, University of Manchester — In this work we have explored the potential of using self-assembling protein molecules as the basic unit for novel biomaterials for biomedical applications. Here we will show how thermo-reversible fibrillar hydrogels can be formed from an aqueous solution of hen egg white lysozyme by adding the reductant dithiothreitol. The elastic modulus of the hydrogels formed has been examined and micro differential scanning calorimetry experiments confirmed that the hydrogels were thermally reversible and that gelation and melting occurs through a solid-liquid like first order transition. Infra-red and transmission electron microscopy studies of very dilute samples revealed the presence of beta-sheet rich fibrils that were 4–6 nm in diameter and 1micron in length. These fibrils self-assemble along their long axes to form larger fibers that become physically entangled to form the 3D network observed in both cryoSEM and small angle neutron scattering studies. We will also demonstrate that we can control and manipulate gel properties by varying the protein concentration, reductant concentration and ionic strength of the matrix.

[1]We thank EU 6th Framework Marie Curie EST 'ExPERT' programme for financial supprt.

Aline Miller
University of Manchester

Date submitted: 19 Nov 2006 Electronic form version 1.4