Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

The Conformation of Clathrin Triskelia in Solution MATTHEW L. FERGUSON, Department of Physics, University of Maryland College Park MD, KONDURY PRASAD, Department of Biochemstry, University of Texas Health Science Center, San Antonio TX, DAN L. SACKETT, HACENE BOUKARI, Laboratory of Integrative and Medical Biophysics, NICHD, National Institutes of Health, Bethesda MD, EILEEN M. LAFER, Department of Biochemstry, University of Texas Health Science Center, San Antonio TX, RALPH NOSSAL, Laboratory of Integrative and Medical Biophysics, NICHD, National Institutes of Health, Bethesda MD — A principal component in the protein coat of certain post-golgi and endocytic vesicles is clathrin, a three-legged heteropolymer (known as a triskelion) that assembles into polyhedral cages principally made up of pentagonal and hexagonal faces. In vitro, this assembly depends on the pH, with cages forming more readily at low pH and less readily at high pH. We have developed procedures, based on static and dynamic light scattering, to determine the radius of gyration, R_g, and hydrodynamic radius, R_H, of isolated triskelia, under conditions where cage assembly occurs. Calculations based on rigid molecular bead models of a clathrin triskelion show that the measured values can be accounted for by bending of the legs and a puckering at the vertex. We also show that the values of R_g and R_H measured for clathrin triskelia in solution are qualitatively consistent with the conformation of clathrin in a "D_6 barrel" cage assembly measured by cryoEM tomography.

Matthew L. Ferguson
Department of Physics, University of Maryland, College Park MD

Date submitted: 22 Dec 2005 Electronic form version 1.4