Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

A Stochastic Coarse-Grained Model of a Red Blood Cell IGOR PIVKIN, GEORGE KARNIADAKIS, Brown University — A Red blood cell (RBC) can be modeled as a fluid volume enclosed by a flexible membrane. The membrane consists of a lipid bilayer and a protein skeleton, which determine the deformation behavior of the RBC. We develop a rigorous coarse-graining procedure for modeling the RBC membrane. The model takes into account the bending energy, in-plane shear energy, and constraints of fixed surface area and fixed enclosed volume. The coarse-grained model is validated against available experimental data and in Dissipative Particle Dynamics (DPD) simulations of the RBC in microcirculation.

George Karniadakis
Brown University

Date submitted: 30 Jul 2007 Electronic form version 1.4