

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**Quantifying the glycocalyx effects in blood flow in capillaries**

MINGGE DENG, HUAN LEI, BRUCE CASWELL, GEORGE KARNIADAKIS,  
Brown University — We employ Dissipative Particle Dynamics (DPD) to simulate blood flow in small capillaries with the glycocalyx attached to the endothelial surface. The effects of the glycocalyx on hematocrit and resistance to blood flow are analyzed by comparing with and without glycocalyx attached to the surface. Of particular interest is the quantification of the slip boundary condition at the edge of glycocalyx and also of the glycocalyx deformation at different grafting densities, stiffness and height of the glycocalyx. In addition to the physical insight gained for this important but relatively unexplored bio-flow, simple models for the slip velocity will be proposed that can be used in continuum simulations of blood flow in micro-vessels.

George Karniadakis  
Brown University

Date submitted: 01 Aug 2011

Electronic form version 1.4