

Abstract Submitted
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Multiscale Modeling of Virus Entry via Receptor-Mediated Endocytosis JIN LIU, School of Mechanical and Materials Engineering, Washington State University — Virus infections are ubiquitous and remain major threats to human health worldwide. Viruses are intracellular parasites and must enter host cells to initiate infection. Receptor-mediated endocytosis is the most common entry pathway taken by viruses, the whole process is highly complex and dictated by various events, such as virus motions, membrane deformations, receptor diffusion and ligand-receptor reactions, occurring at multiple length and time scales. We develop a multiscale model for virus entry through receptor-mediated endocytosis. The binding of virus to cell surface is based on a mesoscale three dimensional stochastic adhesion model, the internalization (endocytosis) of virus and cellular membrane deformation is based on the discretization of Helfrich Hamiltonian in a curvilinear space using Monte Carlo method. The multiscale model is based on the combination of these two models. We will implement this model to study the herpes simplex virus entry into B78 cells and compare the model predictions with experimental measurements.

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