

Abstract Submitted
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Cellular adhesion and dynamic membrane tether extraction

SARAH NOWAK, TOM CHOU, UCLA — We consider the energetics and dynamics of pulling a ligand bound to an integral membrane receptor. Deformation of the cell membrane and cytoskeleton is considered as the ligand is pulled. We assume that deformation of the cytoskeleton obeys Hook's law up to a critical force at which the cell membrane locally detaches from the cytoskeleton and a membrane tether forms. Depending on the pulling velocity and force, a membrane tether of varying length may form before the receptor-ligand bond breaks. We study the probability of tether formation and the mean tether length at the moment of ligand detachment as a function of system parameters. This problem is applicable to AFM studies of cellular adhesion molecules, and to the biological problem of leukocyte rolling.

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