

P053 Molecular force spectroscopy of homophilic nectin-1 interactions

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Nectins are Ca^{2+} independent, immunoglobulin like cell adhesion molecules that localize at adherens junctions (AJs) along with E-cadherins. In this study, We have applied molecular force spectroscopy to study the interaction of a chimera of nectin-1 extracellular fragment and human Fc IgG (nef-1) with L-fibroblasts that express endogenous nectin-1 to elucidate the biophysical characteristics of homophilic nectin-1 *trans*-interactions at the level of single molecule. Bond strength distribution revealed three distinct bound states (or configurations) of *trans*-interactions between paired nectins, where each bound state has a unique unstressed off-rate and reactive compliance. Dissociation of each bound state involves a single activation barrier, with a unique unstressed off-rate and reactive compliance (i.e., force sensitivity). Kinetic analysis of force-dependent dissociation-rate of the bound state involving *trans*-interacting V-V domains between paired nectin-1 (unstressed off-rate $\sim 1.465 \pm 0.779 \text{ s}^{-1}$, reactive compliance $\sim 0.143 \pm 0.072 \text{ nm}$) was found to be closest to E-cadherin, indicating that V-V domain *trans*-interactions are probably necessary to initiate and promote the recruitment of E-cadherin at AJs.