

CBIMMS Invited Seminar
**Co-Sponsored by the Center for Biomolecular and Tissue
Engineering**

“New Perspectives on Biological Adhesion”

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ABSTRACT

The structures of most adhesion proteins of the immunoglobulin (Ig) and cadherin superfamilies consist of multiple tandem repeats of similar domains. I will describe the use of force measurements to determine how these architectures impact the mechanical properties of these proteins. Using the surface force apparatus, we uniquely quantify the impact of the protein architecture on intermembrane potentials. The force-distance profiles have directly demonstrated that these modular protein structures can form multiple bound states that span different intermembrane distances. Domain deletion mutants enabled us to map the precise protein segments mediating these modular, binding mechanisms. Moreover, studies with the neural cell adhesion molecule (NCAM) further identified how posttranslational modification alters its adhesive function. Together these investigations demonstrate that not only the adhesive strength, but also the range of the molecular interactions are essential to the biological function of these proteins.