

Focal adhesions (FAs) play a major role in many physiological functions. Focal adhesions mechanically couple the extracellular matrix (ECM) to the dynamic and contractile actomyosin cytoskeleton, via transmembrane receptors of the integrin family and actin-binding proteins (ABPs). Among these ABPs, talin plays a major role in integrin activation and cytoskeleton anchoring to FAs. In response to force, talin recruits the ABP vinculin, which also associates to the ABP VASP. Our project is to understand the ability of the talin-vinculin-VASP complex to regulate actin assembly. Although the ability of isolated vinculin and isolated VASP to regulate actin assembly is known, talin activity has never been studied. As a preliminary step, we characterized talin activity. Talin contains three actin-binding domains (ABDs). ABD1 spans along the F2 and F3 subdomains of the FERM domain. ABD2 is located in the center of the rod. ABD3 is located at the C-terminus of the protein. We use kinetic assay of actin polymerization in fluorescence spectroscopy and actin filament observation in Total Internal Reflection Fluorescence (TIRF) microscopy to study talin activity. The detail characterization of talin ABD1 demonstrates that it blocks actin filament barbed end elongation.