

Single Filament Interaction of Microtubules and Vimentin Intermediate Filaments

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Many cellular functions such as cell shape, mechanics and intracellular transport rely on the organization and interaction of actin filaments, microtubules and intermediate filaments, which are the main constituents of the cytoskeleton. Intermediate filaments are the least well characterized cytoskeletal polymers, and the nature of their interplay with other components of the cytoskeleton is far from being well understood. Here, we study the interaction between vimentin, one of the most ubiquitous members of the intermediate filament family, and microtubules on a single filament level. Using quadruple optical tweezers, we measure the force necessary to break the interaction between microtubules and vimentin filaments.