Single Molecule Studies on Myosin Motors

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Many types of cellular motility are based on the myosin family of motor proteins. There are now known to be at least 35 different classes of myosins, involved in intracellular transport processes, cytokinesis, muscle contraction, exo- and endocytosis or even signal transduction in vision or hearing. The ability to coordinate the timing of motor protein activation lies at the very centre of this wide range of cellular motile processes. Using a combined approach of recombinant protein expression and single molecule techniques including optical tweezers we study the basic mechanisms of activation, force production and movement of these molecular machines at the single molecule level. In this talk we will report on our recent studies on myosins interacting with lipids and transporting cargo, such as cytoplasmic vesicles, over micrometer distances along the actin cytoskeleton in the cell.