

Mounting evidence implicates the protein centrin in the control of centriole duplication. Centrin is one of the first proteins to localize at sites of newly forming centrioles, and is required for structural integrity of pre-existing centrioles. siRNA 'Knockdown' of centrin in HeLa results in failure of centriole duplication. Yet it remains to be determined just how centrin functions to control this process. Here, I will present data in support of a proposed mechanistic model to explain the regulation of centriole duplication by centrin. In this model, centrin is both a structural and regulatory component that is required for the organization of the nascent centriole bud and its transformation into a procentriole, and finally into a centriole. During this transformation, centrin contained within the initial organizing structure moves into the distal-most region of the elongating centriole by transitioning along with plus ends of the centriolar microtubules as they grow tipward. This transformation is coordinated with loss of primary cilia from the pre-existing 'older' centriole and is regulated by G1/S transition-specific phosphorylation near centrin's carboxy-terminus at serine residue 170.