Title:	Multiple Roles, Multiple Adaptors: Dynein During Cell Cycle
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Abstract:	Dynein is an essential protein complex present in most eukaryotes that regulate biological processes ranging from ciliary beating, intracellular transport, to cell division. Elucidating the detailed mechanism of dynein function has been a challenging task owing to its large molecular weight and high complexity of the motor. With the advent of technologies in the last two decades, studies have uncovered a wealth of information about the structural, biochemical, and cell biological roles of this motor protein. Cytoplasmic dynein associates with dynactin through adaptor proteins to mediate retrograde transport of vesicles, mRNA, proteins, and organelles on the microtubule tracts. In a mitotic cell, dynein has multiple localizations, such as at the nuclear envelope, kinetochores, mitotic spindle and spindle poles, and cell cortex. In line with this, dynein regulates multiple events during the cell cycle, such as centrosome separation, nuclear envelope breakdown, spindle assembly checkpoint inactivation, chromosome segregation, and spindle positioning. Here, we provide an overview of dynein structure and function with focus on the roles played by this motor during different stages of the cell cycle. Further, we review in detail the role of dynactin and dynein adaptors that regulate both recruitment and activity of dynein during the cell cycle.
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