CDC7L1 Kinase Complex

National Cancer Institute

Source

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The G1/S transition in eukaryotic cells is strictly regulated so that DNA replication occurs only once during S phase. The CDC7L1 kinase complex may trigger S phase by directly activating the replication initiation complexes assembled at the origins. Phosphorylation of MCM2 and MCM3 in the MCM complex by the CDC7L1 kinase complex converts the inactive MCM complex into an active helicase. Activator of S Phase Kinase, encoded by the ASK gene, is a cyclin-like regulatory subunit of the CDC7L1 kinase complex. This protein is the major activator of CDC7L1. ASK plays a pivotal role in the G1/S transition in mammalian cells and its function is essential for entry into S phase. ASK interacts with CDC7L1 and stimulates the kinase activity of CDC7L1. CDC7L1-dependent kinase activity reflects the ASK protein level, significantly increasing in cells in S phase, and ASK protein is extensively phosphorylated during S phase, presumably by CDC7L1.