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Seminar Abstract

Regulation of RNA Polymerase II recruitment to promoters is thought to be the major mechanism by which gene expression is controlled during development. Control of messenger RNA elongation by RNA Polymerase II represents another potential target for gene control. The ELL protein was initially purified as a factor that increases the rate of RNA Polymerase II elongation in vitro. We showed that *Drosophila* ELL is associated with RNA Polymerase II on chromosomes and in cell extracts. RNA Polymerase II phosphorylation is required for efficient recruitment of ELL. We identified the first mutations in ELL. ELL is essential in *Drosophila*, has a general role in development and is required for normal Notch and ras pathway signaling. Surprisingly, a domain of ELL that is required for RNA Polymerase II elongation activity in vitro and for chromosome targeting in vivo is dispensable for the essential function of ELL, suggesting that it plays other roles besides control of transcription. On the other hand, a domain of ELL implicated in certain leukemias appears to be required for the essential function of ELL.