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An integrated regulatory network reveals pervasive cross-regulation among transcription and splicing factors

The operation of a living cell depends on its ability to regulate its different functions. The master regulators in the cell are proteins that control the function of many other genes by several mechanisms. Transcription factors can differentially activate or repress transcription of genes by binding to their regulatory elements. A second major mechanism of gene expression regulation occurs at the level of alternative splicing. Alternative splicing is regulated by splicing factors that bind to short regulatory motifs on the RNA and dictate the final gene architecture. Traditionally the gene expression pathway was regarded as being composed of independent steps, from RNA transcription to protein translation. To-date there is increasing evidence for coupling between the different processes of the pathway, specifically between transcription and splicing.