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Control of adaptive responses to stress SAPKs

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Exposure of yeast cells to increases in extracellular osmolarity results in the activation of the Hog1 MAP kinase. Activation of this MAP kinase is required to generate a set of osmoadaptive responses essential to survive under high osmolarity conditions. Adaptation to osmostress requires the induction of a large number of genes, which indicates the necessity to regulate several aspects of the cell physiology. Induction of gene expression is highly dependent on the presence of the MAP kinase, which suggests a key role for the HOG signaling pathway in the regulation of gene expression in response to osmostress. In response to stress, the MAPK controls several mechanisms related to transcription initiation and elongation as well as chromatin organization. The MAPK also controls cell cycle. Here, the MAPK is able to modulate cell cycle delay in different phases which highlight the relevance of cell cycle control in response to stress.