

## Stress signaling pathways

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Effective mechanisms to deal with stress are vital to all living organisms. To maintain cellular viability, stress signaling pathways and their responses must be rapid, sensitive and robust. In *E. coli*, separate responses cope with stress in the cytoplasmic and envelope compartments of the cell. Each response is carried out by an alternative  $\sigma$  factor. A signal transduction cascade that has proteases as central mediators controls the activity of each  $\sigma$ . During normal cell growth, the envelope stress response is induced primarily by unassembled outer membrane porins (OMPs) in the envelope compartment.  $\sigma^F$  directs this response and its activity is controlled by RseA, a membrane spanning anti-sigma factor. I will discuss the design principles of the proteolytic cascade that carries out regulated proteolysis of RseA.