

Cellular mechanisms of endoplasmic reticulum stress signaling in health and disease. 1. An overview

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© 2014 the American Physiological Society. Increased demand on the protein folding capacity of the endoplasmic reticulum (ER) engages an adaptive reaction known as the unfolded protein response (UPR). The UPR regulates protein translation and the expression of numerous target genes that contribute to restore ER homeostasis or induce apoptosis of irreversibly damaged cells. UPR signaling is highly regulated and dynamic and integrates information about the type, intensity, and duration of the stress stimuli, thereby determining cell fate. Recent advances highlight novel physiological outcomes of the UPR beyond specialized secretory cells, particularly in innate immunity, metabolism, and cell differentiation. Here we discuss studies on the fine-tuning of the UPR and its physiological role in diverse organs and diseases.