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Golgi stress response regulates expression of glycosylation enzymes

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The capacity of each organelle in eukaryotic cells is tightly regulated in accordance with cellular demands, which is called the organelle autoregulation. The endoplasmic reticulum (ER) stress response regulates the capacity of the ER, while the Golgi stress response controls that of the Golgi apparatus. Since the main function of the ER is protein folding, the ER stress response induces transcription of ER chaperone genes when the capacity of protein folding becomes insufficient and unfolded proteins are accumulated in the ER (ER stress). Similarly, the major function of the Golgi apparatus is glycosylation of secretory and membrane proteins, and the Golgi stress response upregulates transcription of genes encoding glycosylation enzymes if the capacity of glycosylation becomes insufficient (Golgi stress). Recently, we identified four response pathways of the mammalian Golgi stress response—the TFE3 pathway, the proteoglycan pathway, the mucin pathway and the glycosphingolipid pathways, which regulate expression of specific glycosylation enzymes. Our recent findings on the molecular mechanism and how the Golgi stress response regulates transcriptional induction of genes encoding Golgi glycosylation enzymes will be discussed at the conference.

Biography

Hiderou Yoshida has completed his PhD from Kyoto University, School of Science and Post-doctoral studies from University of Melbourne and Kyoto University. He is the Professor of University of Hyogo, School of Science, and has been analyzing the ER stress response and the Golgi stress response.

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