

The Ubiquitin-Proteasome System (UPS) in beneficial and pathogenic plant microbe interactions

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The control of protein homeostasis, a balance between their synthesis and degradation, also called proteostasis, is essential for cell survival. Any imbalance of the proteome, for instance triggered by a stress, leads to an accumulation of misfolded proteins leading to proteotoxic stress that can induce cell death. The ubiquitin proteasome system (UPS) is a major actor in the selective degradation of misfolded proteins to preserve proteome balance.

The chaperone-like Cdc48 is a member of the AAA+ ATPase enzyme family which is conserved in mammals (VCP), yeasts and plants (Cdc48: *Cell Division Cycle 48/p97*). Cdc48/VCP is a cytosolic and nuclear protein which segregates misfolded proteins from subcellular structures or protein complexes, and brings them to the proteasome to facilitate their recycling or degradation. Therefore, Cdc48/VCP is involved in numerous cellular pathways such as membranes associated degradation, cell cycle regulation, genome stability, vesicular trafficking, autophagy and apoptosis. However, the role of Cdc48 in response to biotic stresses is still poorly understood. In particular, the involvement and regulation of Cdc48 in the establishment of beneficial interactions have been little understood. We therefore propose to study and compare the involvement and regulation of Cdc48 during the establishment of beneficial and pathogenic interactions between plants and microorganisms.