

Summary of: Endoplasmic reticulum—shape and function in stress translation

Key findings:

- The endoplasmic reticulum (ER) is a dynamic network of membrane tubules and sheets that controls organelle communication and cell survival under stress.
- ER network dynamics are regulated by myosins, which affect ER tubulation, sheet formation, and persistence.
- ER proteins are synthesized and transported to the Golgi complex, but some reach the vacuole without passing through intermediate compartments.
- The ER is essential for protein folding and quality control, ensuring only correctly folded proteins are exported.
- Under stress, the ER undergoes unfolded protein response (UPR) and ER associated degradation (ERAD) to eliminate misfolded proteins.
- The ER is hijacked by viruses to promote pathogenesis, activating the UPR and aiding in virus protein folding.
- The ER has a conserved role in plant immunity, while unique strategies are employed by plants.
- The ER is involved in cell death, programmed cell death (PCD), and programmed cell death-like activities.
- The ER is a crucial organelle for plant stress adaptation, supporting cell survival and facilitating plant immunity.
- The ER's architecture and dynamics are essential for its functions, providing a stable microenvironment for metabolite synthesis and secreted proteins.
- The ER's role in stress adaptation highlights its relevance for sustainable crop production.
- The ER's multi-functionality underscores its importance in plant biology research.