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Elucidation of the roles of syntaxin 17 localized in the mitochondria-associated membrane (MAM) and its participation in MAM-associated diseases

Roles of
Membrane Contact Sites in
Organelle Dynamics and
Diseases

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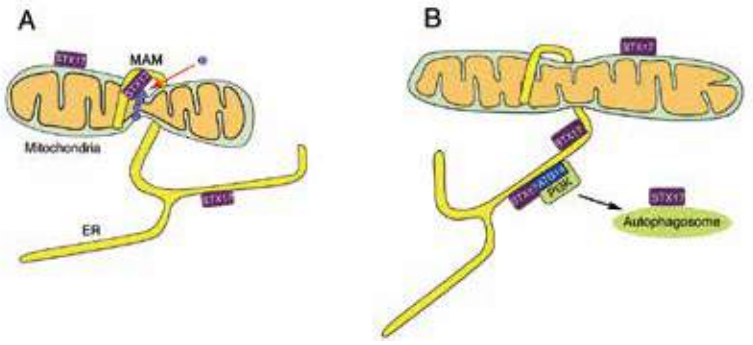
Research summary

The endoplasmic reticulum (ER) contains various subdomains that are in contact with other organelles. The ER subdomain facing mitochondria is called the mitochondria-associated membrane (MAM). The MAM regulates mitochondrial activity through Ca^{2}+ and synthesizes lipids in cooperation with mitochondria. Accumulating data have disclosed that the ER-mitochondria interface is the site for various important cell functions, beyond Ca^{2}+ homeostasis and lipid synthesis. Moreover, the close relationship between this site and neurodegenerative diseases has been pointed out. In this project, we will explore the roles of syntaxin 17 (STX17) in the ER-mitochondria interface and MAM-associated diseases.

Figure

Different roles of STX17 in response to cellular physiology. (A) In fed cells, STX17 promotes mitochondrial fission by regulating Drp1 (represented by D in blue circle) localization/activity. (B) In starved cells, STX17 switches its binding from Drp1 to the PI3K subunit ATG14, leading to mitochondrial elongation and autophagosome formation. This elongation allows mitochondria to escape from autophagic degradation.



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