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Energy deprivation-induced autophagy and aggrephagy: insights from yeast and mammals

Key words: Autophagy; Glucose starvation; Solid aggrephagy; Chaperonin-containing TCP-1, subunit 2 (CCT2)

Research Summary

This review mainly outlined the progress of our lab's research on energy deprivation-induced autophagy and solid aggrephagy.

- The initiation of energy deprivation-induced autophagy
- Atg1-mediated Atg11 phosphorylation regulates selective autophagy
- The receptor CCT2 regulates solid aggrephagy

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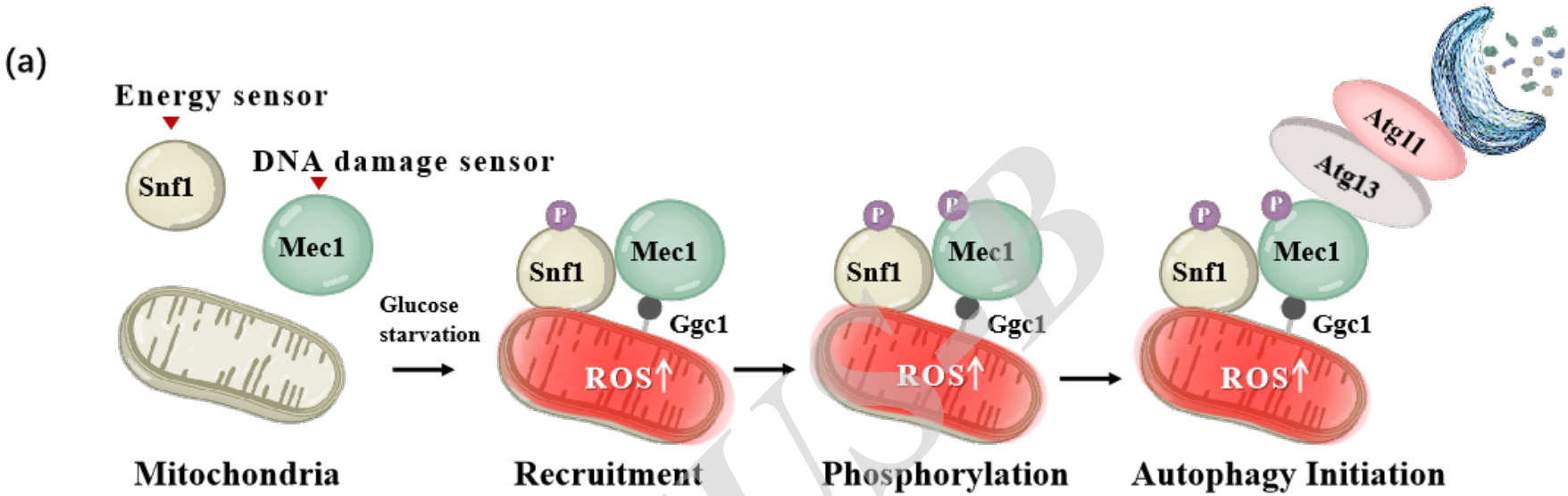
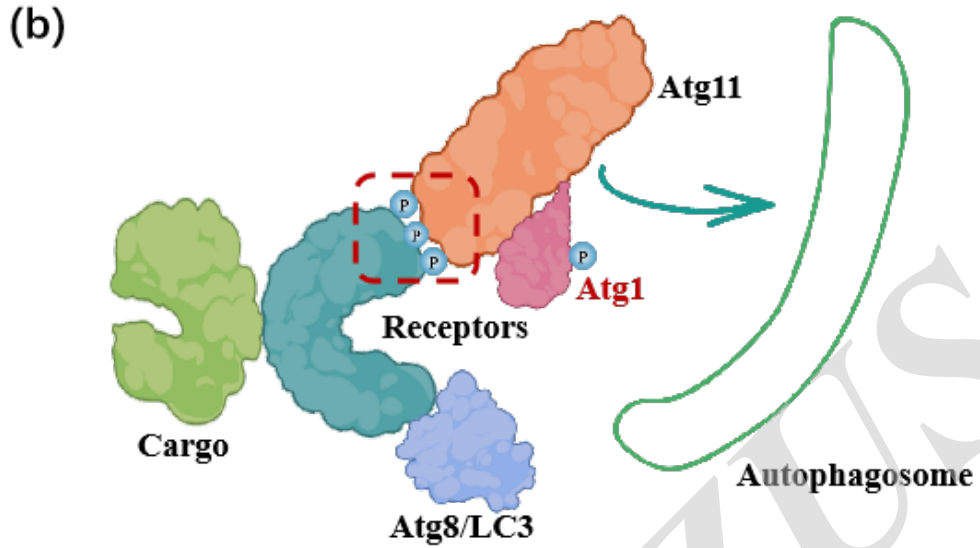
Innovation points



(a) When cells face glucose starvation, there is a notable increase in cellular ROS, which induces the recruitment of Mec1 to mitochondria. At the mitochondria, the energy sensor Snf1 phosphorylates Mec1. Phosphorylated Mec1 then facilitates the recruitment of the Atg1 complex to the mitochondria by directly interacting with the autophagic protein Atg13, thereby initiating autophagy induced by energy deprivation.

Innovation points



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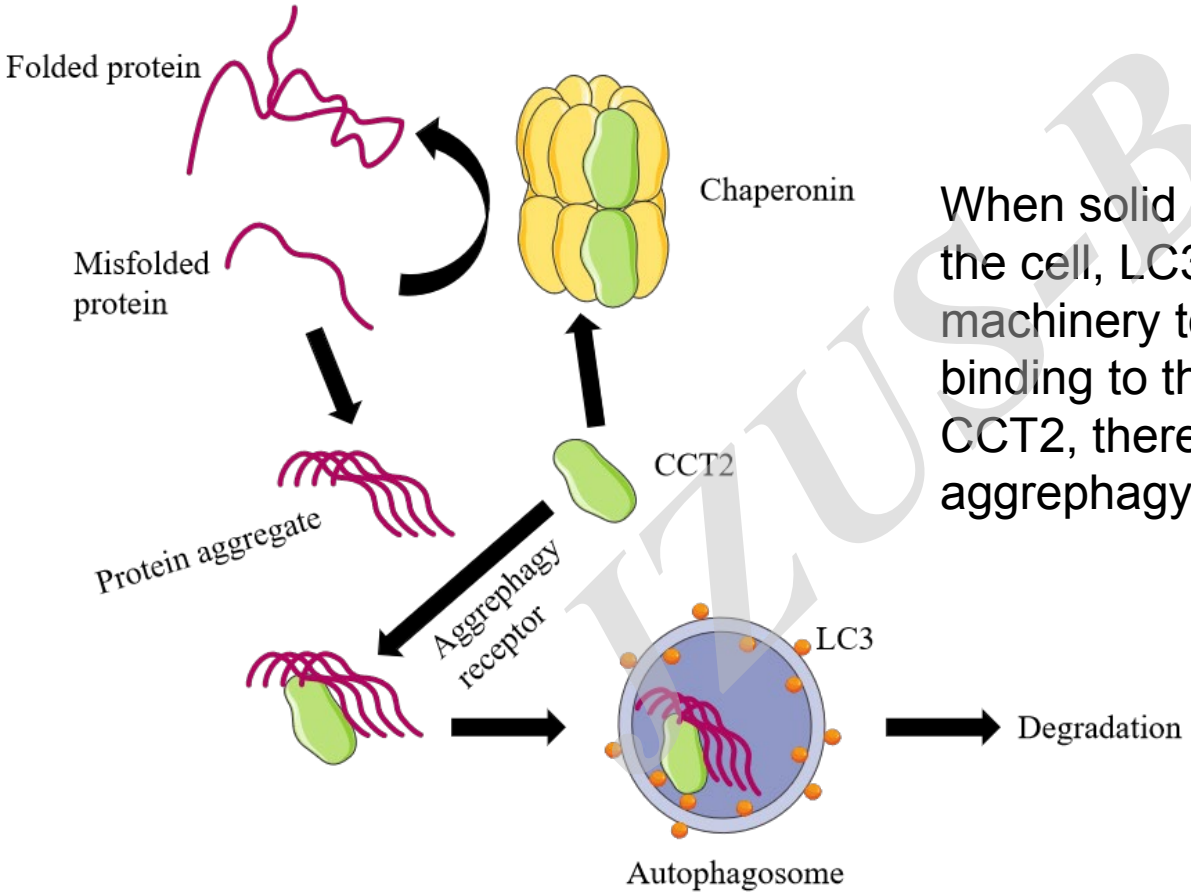
(b) When cells face autophagy-inducing stress, the activated Atg1 phosphorylates the selective autophagy marker protein Atg11, facilitating the binding of Atg11 to selective autophagy receptors, thereby initiating selective autophagy.

Innovation points



When solid aggregates accumulate within the cell, LC3 recruits the autophagic machinery to the protein aggregates by binding to the LIR motif of the receptor CCT2, thereby initiating solid aggrephagy.

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