Current mechanistic insights into the CCCP-induced cell survival response

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Résumé en anglais	The ring-substituted derivatives of carbonyl cyanide phenylhydrazone, CCCP and FCCP, are routinely used for the analysis of the mitochondrial function in living cells, tissues, and isolated mitochondrial preparations. CCCP and FCCP are now being increasingly used for investigating the mechanisms of autophagy by inducing mitochondrial degradation through the disruption of the mitochondrial membrane potential (ΔΨm). Sustained perturbation of ΔΨm, which is normally tightly controlled to ensure cell proliferation and survival, triggers various stress pathways as part of the cellular adaptive response, the main components of which are mitophagy and autophagy. We here review current mechanistic insights into the induction of mitophagy and autophagy by CCCP and FCCP. In particular, we analyze the cellular modifications produced by the activation of two major pathways involving the signaling of the nuclear factor erythroid 2-related factor 2 (Nrf2) and the transcription factor EB (TFEB), and discuss the contribution of these pathways to the integrated cellular stress response.
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