Buffy can rescue the inhibition of Cg2076, a GHITM homologue in *Drosophila melanogaster* neurons.

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Editorial Note

GHITM (growth hormone-inducible transmembrane protein) is an inner mitochondrial membrane protein with the Bax inhibitor-1 motif that regulates mitochondrial morphology, particularly cristae construction. Downregulation of GHITM leads to fragmented mitochondria and cytochrome c release, whereas upregulation delays cytochrome c release. Using RNA interference, we suppressed CG2076, a Drosophila GHITM homologue, in neurons and examined the behavioural ramifications of this mitochondrial protein.

The Dopa decarboxylase (Ddc) transgene controls the directed expression of GHITM-RNAi in neurons, which results in a shorter lifespan and reduced climbing capacity. When Buffy, Drosophila's only anti-apoptotic B cell lymphoma 2 (Bcl-2) protein, is co-expressed with GHITM-RNAi, the decreased lifespan and age-dependent loss of climbing ability are suppressed.

When GHITM is inhibited in the Drosophila eye, the number of ommatidia is reduced and the ommatidial array is disrupted, abnormalities that are reversed when Buffy is overexpressed. Inhibition of the mitochondrial GHITM in Drosophila Ddc-Gal4-expressing neurons leads in shorter lifetime and loss of climbing ability, symptoms that are indicative of dopaminergic neuron degeneration and death, and is improved by overexpression of the pro-survival protein. Buffy The transmembrane Bax inhibitor-1 motif containing (TMBIM) family contains multiple antiapoptotic members that have been found in viruses, bacteria, protozoans, plants, and animals throughout evolution.

TMBIM1/ RECS1 is mostly located in endosomal/lysosomal membranes, while TMBIM2/LFG is present in the plasma and intracellular membranes of the Golgi and the endoplasmic reticulum (ER). TMBIM3/GRINA is largely found in the ER and Golgi compartments; TMBIM4/GAAP is found in the Golgi apparatus and the ER; TMBIM5/GHITM is found in the mitochondrial inner membrane; and TMBIM6/BI-1 is found in the ER and Golgi compartments. Mitochondrial morphology and cristae 1 (MICS1), also known as Growth hormone-inducible transmembrane protein (GHITM)/TMBIM5, is a mitochondrial inner membrane protein that is involved in mitochondrial morphology, specifically the cristae, and is implicated in the release of cytochrome c from the mitochondria.

Overexpression of GHITM/MICS1 prevents the release of cytochrome c from the inner mitochondria membrane without causing permeabilization by Bax, but it does not prevent apoptosis. As a result, its job in maintaining mitochondrial shape is different from its activity in the apoptotic process. CG2076 and CG1287 are expected to be the *Drosophila melanogaster* homologues. According to BLAST, the two putative genes have 56 percent and 53 percent protein sequence identity to the human GHITM, respectively; CG2076 is more closely related to the human homologue. The two genes are very closely linked, with 67 percent identity and 82 percent similarity in their protein sequences, according to bioinformatic analyses. On FlyBase, CG2076 has two annotated transcripts, but only one of them is unique, whereas CG1287 has only one. With promising results, Drosophila has been employed as a model organism to research the phenotypic effects of variable gene expression and to model human disorders. DA neurons are sensitive to minor variations in gene products and deteriorate with age, which can be measured by evaluating the affected flies' climbing abilities. The effects of inhibiting CG2076, the *Drosophila melanogaster* homologue of GHITM, in Ddc- GAL4-expressing neurons were studiedOverexpression of the lone pro-survival Bcl-2 homologue in Drosophila, Buffy, was used to see if the Bcl-2 proteins, known as the?guardians? of the mitochondria, can rescue the CG2076/GHITM-induced abnormalities.

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