

# Tumor suppressor gene also essential for hormone-controlled development, tissue regeneration and stress-response

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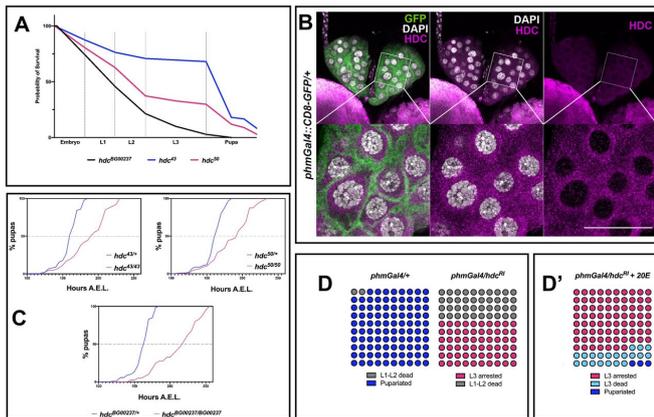


Fig 1. headcase is expressed in the prothoracic gland and controls molting in *Drosophila*. *PLOS Genetics* (2021). DOI: 10.1371/journal.pgen.1009362

Adult progenitor cells are present in the *Drosophila* fly as early as its larvae stage. These cells are the only ones that are maintained throughout development and they are responsible for giving rise to adult tissues and organs. Headed by Jordi Casanova (also an IBMB-CSIC researcher), the Development and Morphogenesis in *Drosophila* lab at IRB Barcelona has identified the headcase (*hdc*) gene as responsible for the unique characteristics of these adult progenitor cells.

"In our study, mainly using the powerful genetic tools available in *Drosophila*, we were able to show that this gene regulates the development of the organism, including the stages of metamorphosis, by controlling the growth, proliferation, survival and resistance to stress of adult progenitor cells," Casanova explains.

The headcase gene is homologous to the human HECA gene, and it plays a key role in cancer,

acting as a tumor suppressor in both organisms, as it slows down cell cycle.

## The link between stress and cancer

Besides identifying headcase as an essential gene for adult progenitor cells, the researchers led by Casanova have also characterized its mechanisms of action. In addition to its participation in hormone-stimulated growth control, this gene is also involved in the [stress response](#) and it maintains an equilibrium between these two processes.

"The finding that the headcase gene confers stress protection opens up a new avenue to be explored regarding the role of human HECA as it could also act as a stress protector and its absence may induce stress conditions that favor the initiation and progression of cancer," says Panagiotis Giannios, postdoctoral researcher and first author of the paper.

**More information:** Panagiotis Giannios et al. Systemic and local effect of the *Drosophila* headcase gene and its role in stress protection of Adult Progenitor Cells, *PLOS Genetics* (2021). DOI: [10.1371/journal.pgen.1009362](https://doi.org/10.1371/journal.pgen.1009362)

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