

HEADCASE AS A PLAYER IN STRESS RESPONSE IN THE HEMATOPOIETIC NICHE IN *DROSOPHILA MELANOGASTER*

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Due to the conservation of transcription factors and signaling pathways regulating hematopoiesis throughout evolution, *Drosophila melanogaster* can be considered as an excellent model to study blood cell differentiation. In the major hematopoietic organ in *Drosophila*, the lymph gland, a small cluster of cells, the Posterior Signaling Centre (PSC) acts as a niche to control the balance between maintenance and differentiation of blood cell progenitors. In response to an immune stress such as wasp parasitism or nutrition deficiency, lymph gland hematopoiesis is drastically modified, leading to increased progenitor proliferation and differentiation into lamellocyte, a specific blood cell type which neutralizes the parasite.

In our screen to find new regulators of hematopoiesis in *Drosophila*, we isolated Headcase (Hdc). In the lack of Hdc function, lamellocytes appear in the circulation without immune induction. We found that in the hematopoietic niche, Hdc interacts with Unkempt (Unk), thereby enabling the function of the Hedgehog and Decapentaplegic pathways, which maintain the progenitor pool in the lymph gland.

Since Hdc and Unk were described as negative regulators of the insulin/mTor pathway in the imaginal discs, we investigated whether they play a similar role in the hematopoietic niche as well. Our genetic interaction studies suggest that loss of Hdc and Unk function leads to hyperactivation of the insulin pathway and potentially, cellular stress in the PSC inducing premature progenitor differentiation.

We hope that our results facilitate a better understanding of how stress response contributes to the modulation of blood cell differentiation in the hematopoietic niche.

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