

A new cell-autonomous role for the HECA orthologue, Headcase, in blood cell progenitor maintenance in the *Drosophila* lymph gland

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Since signaling pathways controlling blood cell differentiation show high levels of conservation, *Drosophila melanogaster* is a widely used model to research hematopoiesis. The extensively studied hematopoietic organ of the *Drosophila* larva, the lymph gland, contains hemocyte (blood cell) progenitors in its medullary zone (MZ) and differentiated hemocytes in its cortical zone (CZ). The third functional zone of the organ is the posterior signaling centre (PSC), which is a stem cell niche that maintains the undifferentiated state of the progenitors through its regulatory function. We previously described Headcase (Hdc), the orthologue of the HECA human tumor suppressor as a factor that plays a non-cell autonomous role in the niche to suppress premature differentiation of the progenitors. Knocking down *hdc* in the niche causes the differentiation of special effector blood cells, lamellocytes, which normally appear only after immune challenges. Here, we describe a new cell-autonomous regulatory role for Headcase in the MZ to control progenitor fate utilizing signaling pathways that are distinct from those of the PSC. In both the PSC and MZ, *hdc* loss-of-function resulted in higher levels of reactive oxygen species (ROS), suggesting that cellular stress triggers progenitor differentiation even without immune induction. We hope our results contribute to the better understanding of the regulatory events that maintain blood cell progenitors in a hematopoietic niche.

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