

Identification of a novel network regulating lamellocyte fate in the lymph gland of *Drosophila melanogaster*

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Throughout an individual's lifespan, hematopoietic stem cells (HSCs) differentiate to replenish all kinds of blood cells through a process called hematopoiesis. As the molecular pathways controlling this process are highly conserved, a wide variety of tools were created to follow blood cell development in *Drosophila* to make it a great model for investigating hematopoiesis. Three types of blood cells exist in the circulation of the *Drosophila* larva: phagocytic plasmatocytes, crystal cells that are involved in wound healing, and a specialized cell type that differentiates only in response to immune challenge and play a role in parasitic wasp encapsulation, the lamellocyte. In a search for new regulators of hematopoiesis, we have isolated novel candidate genes whose silencing lead to lamellocyte differentiation without immune induction, suggesting that they play a role in hemocyte progenitor maintenance. These genes include: *headcase* (*hdc*), the orthologue of the *HECA* human tumor suppressor, *Myeloid leukemia factor* (*Myf*), *Heat shock protein cognate 4* (*Hsc70-4*) and *DNA replication-related element factor* (*Dref*). Knockdown of the expression of these genes in the different hematopoietic domains revealed that their function is confined to the lymph gland of the larva. Our genetic interaction experiments shed light on how these factors cooperate with each other and with signaling pathways in the lymph gland. As the orthologues of these factors are involved in the formation of human cancers and leukemias, we hope that our results will lead to a better understanding of their role in humans.

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