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Title:	The requirement of Unpaired2 (upd2), the ligand for JAK-STAT signaling pathway for the homeostasis of Drosophila larval hematopoietic organ
Authors:	<a href="#">Aiswarya, A.S.</a>
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Abstract:	<p>Hematopoiesis is the process by which blood cells are formed. There are studies going on across the globe on hematopoiesis by using various model systems. Amongst its diverse roles in vertebrates, most important roles of blood are the transport of oxygen, nutrients and rendering of immunity for the organism. The WBCs or white blood corpuscles are responsible for the immunity of the organism, which is crucial for its protection from pathogens. There is conservation of the overall hematopoietic process from invertebrates to vertebrates. The invertebrate in which the process of hematopoiesis is widely studied is Drosophila melanogaster. The Drosophila immune system has three types of cells – (1) the plasmacytes, which functions like the macrophages or monocytes in vertebrates by phagocytosing the foreign bodies, (2) crystal cells that are insect specific and involved in wound healing, (3) lamellocytes which also performs phagocytosis of pathogens that are too large for the plasmacytes to deal with. What makes this model system favourite in the areas of hematopoietic research is that the similarity of the transcription factors and signaling pathways involved in both Drosophila and vertebrate hematopoiesis [2] [5]. One of the major signaling pathways involved in Drosophila hematopoiesis is the JAK- STAT signaling pathway. In general, the JAK-STAT pathway in Drosophila is turned on by the binding of the ligand, either cytokines Upd1, 2 or 3. The role of Upd3 in the lymph gland hematopoiesis is known. But the role of Upd2 is still a mystery. We were able to show that the knockdown of upd2 from the differentiated hemocytes (cortical zone) of the lymph gland severely imbalances the homeostasis of the three zones of the lymph gland. This includes the early differentiation of progenitors, complete absence of crystal cells and the abnormal increase in niche cells. Our results suggests that Upd2 plays an important role in the maintenance of lymph gland homeostasis. Further studies on this aspect will throw further insights to the role of JAK-STAT signaling in blood disorders and cancers.</p>
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