Title:	Exploring the molecular circuitry governing Drosophila larval hematopoiesis during development and infection
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Abstract:	Introduction In biology, a niche is defined as an anatomic structure that integrates local and systemic signaling in sustaining the proliferation, maintenance, and survival of specialized cells known as stem cells. Stem cells are self-renewing multipotent cells which are majorly involved in tissue growth, turnover, and repair. Hematopoietic niches play a pivotal role in orchestrating both tissue development and an organism's immune/infection response. Since studies have shown that most hematological disorders display aberrant niche function, understanding what it takes to make a hematopoietic niche is extremely important 1,2 . Studies in this direction can help us identify molecules that can target niches for therapies. A decade of studies has established Drosophila larval lymph gland as a popular model for studying blood cell development 3 . The current work employs this model system to unravel the crucial signals for the maintenance of niche and progenitor and pivotal for hematopoietic stem cell (HSC) division. Relish is a key factor in inducing the humoral immune response in Drosophila, including antibacterial and antifungal factors 4,5 . Previous research had ruled out the possibility of this transcription factor playing a role in hematopoiesis 6 . The expression of Relish in niche cells and the progenitor cells during development prompted us to explore its role in larval hematopoiesis. The first instar larval lymph gland harbours novel Hematopoietic stem cells (HSCs) that can potentially give rise to all blood cell types of the larvae 7 . These Notch+ stem cells depend upon Decapentaplegic (Dpp) signaling emanating from the niche for their survival and maintenance and thereby show a striking resemblance to vertebrate aorta-gonadal-mesonephros (AGM) HSCs. Detailed temporal analysis revealed that the first round of HSC asymmetric division happens around 14.5 hours after egg hatching (AEH). But the molecular circuit that precisely governs such a division was yet to be identified.
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