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BLOOD CELL DIFFERENTIATION- COMPARTMENTS, REGULATION AND EVOLUTION

Blood cell differentiation shows striking similarities among evolutionarily distant taxa. Hematopoiesis starts in the early embryo, and blood cells localize in separate hematopoietic compartments during ontogeny. Certain compartments function as classic hematopoietic niches that contain hematopoietic stem cells, which are able to proliferate and differentiate into functionally diverse effector cells. In spite of the significant differences in their immune systems, the functions of immune compartments and cells are similar in distantly related organisms, and blood cell differentiation is regulated by highly conserved transcription and epigenetic factors in the animal kingdom. The parallels in the function of blood cells, their organization in compartments and the regulation of their development indicates convergent evolution that underlines the importance of innate immunity in the defence against invaders. The comparison of our experimental research data on the hematopoiesis and immune functions of different *Drosophila* species with the knowledge gained so far on mammalian models allows us a better understanding of the most important features of innate immunity.