

**Concise Review: Paracrine Functions of Vascular Niche Cells in Regulating Hematopoietic Stem Cell Fate.**

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**Authors:** Joshua P Sasine, Kelly T Yeo, John P Chute

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**Public Summary:**

The functions of vascular endothelial cells (ECs) in regulating oxygen delivery, nutrient exchange, coagulation, and transit of inflammatory cells throughout the body are well-established. ECs have also been shown to regulate the maintenance and regeneration of organ-specific stem cells in mammals. In the hematopoietic system, hematopoietic stem cells (HSCs) are dependent on signals from the bone marrow (BM) vascular niche for their maintenance and regeneration after myelosuppressive injury. Recent studies have demonstrated the essential functions of BM ECs and perivascular stromal cells in regulating these processes. In the present study, we summarize the current understanding of the role of BM ECs and perivascular cells in regulating HSC maintenance and regeneration and highlight the contribution of newly discovered EC-derived paracrine factors that regulate HSC fate. **SIGNIFICANCE:** Recent studies have shown that blood stem cells require signals from the bone marrow microenvironment or niche for their survival and regeneration. In the present study, the current understanding of the interactions between blood stem cells and niche cells is summarized and the potential for niche-derived secreted factors as therapeutic agents for regenerative medicine is highlighted.

**Scientific Abstract:**

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