Role of secreted factors in the regulation of hematopoietic stem cells by the bone marrow microenvironment.

Abstract: The stem cell microenvironment (in vivo known as niche) is a specific space in the bone marrow (BM), which nurses hematopoietic stem cells and regulates their self-renewal and differentiation using extrinsic cues, such as secreted factors. The niche plays a major role in regulating the number of blood cells and also protects stem cells against excessive proliferation. Till date, several possible secreted regulators of HSC function have been reported. Many of these were originally isolated from stromal cells and the cell lines isolated from hematopoietic tissues. These secreted factors act in concert and not only regulate HSC, but also the niche cells. It has also become clear that deregulation of the niche function is a potential cooperating factor during the development of hematological malignancies. An understanding of how the niche participates in HSC maintenance and repair through soluble factors can offer new opportunities for the development of novel therapeutic tools against hematological malignancies.