

Interaction between the capillary–milieu and the epidermal stem cells regulates wound healing

Ken-ichi Mizutani

Laboratory of Stem Cell Biology, Graduate School of Pharmaceutical Sciences, Kobe Gakuin University

Endothelial cells (ECs) form an extensive network of blood vessels that has numerous essential functions in the vertebrate body. In addition to their well-established role as a versatile transport network, blood vessels can induce organ formation or direct growth and differentiation processes by providing signals in a paracrine (angiocrine) fashion. ECs are emerging as important signaling centers that coordinate regeneration and help to prevent deregulated, disease-promoting processes. Vascular cells are also part of stem cell niches and have key roles in hematopoiesis, bone formation, and neurogenesis. Here we established the experimental system to observe vascular networks in skin tissue, and found that vascular regularity in the back skin was predominantly disrupted with aging. Furthermore, the wound healing was significantly delayed in VEGFR-1 heterozygous knockout mice, suggesting that healing process requires the proper restoration of vasculature in the skin tissue.