Editorial: the vascular niche in tissue repair: a therapeutic target for regenera...

Health & Medicine

Editorial on the Research Topic

The Vascular Niche in Tissue Repair: A Therapeutic Target for Regeneration

In mammals, although regeneration is quite restricted to a number of tissues and organs, this particular healing process is possible through the existence of tissue-resident stem/progenitor cells. Upon injury, these cells are activated, they proliferate, migrate, and differentiate into tissue-specific cells and functionally replace the damaged or lost cells. Besides this, angiogenesis and neovascularization play crucial roles in tissue repair. Blood vessels (BV) together with the resident surrounding cells create a vascular niche which is central to local and distant signaling thereby shaping the regenerative response.

The Frontiers Research Topic " The Vascular Niche in Tissue Repair: A Therapeutic Target for Regeneration" encompasses 14 articles highlighting various aspects of the vascular niche (VN) in health and disease. This research topic first describes *ex vivo* methodological aspects to study the role of the VN in regeneration, second addresses the VN cellular composition and roles during regeneration, third described local as well as distant signaling mechanisms regulating the VN in regeneration and, finally addresses the VN responses in pathology.

Vascular Niche: Methodological Insights in the Study of Angiogenesis and Regeneration

Two papers highlight special methods to study the VN. Hutter-Schmid et al. present organotypic brain slices cultures as a tool and a system to study angiogenesis in the brain. This is certainly a very valuable method as it

presents cells in their physiological context and provides a screening tool for the search for factors to modulate angiogenesis and neovascularization in the brain.

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Goritz, C., Dias, D. O., Tomilin, N., Barbacid, M., Shupliakov, O., and Frisen, J. (2011). A pericyte origin of spinal cord scar tissue. *Science* 333, 238–242. doi: 10. 1126/science. 1203165

Tsai, H. H., Niu, J., Munji, R., Davalos, D., Chang, J., Zhang, H., et al. (2016). Oligodendrocyte precursors migrate along vasculature in the developing nervous system. *Science* 351, 379–384. doi: 10. 1126/science. aad3839