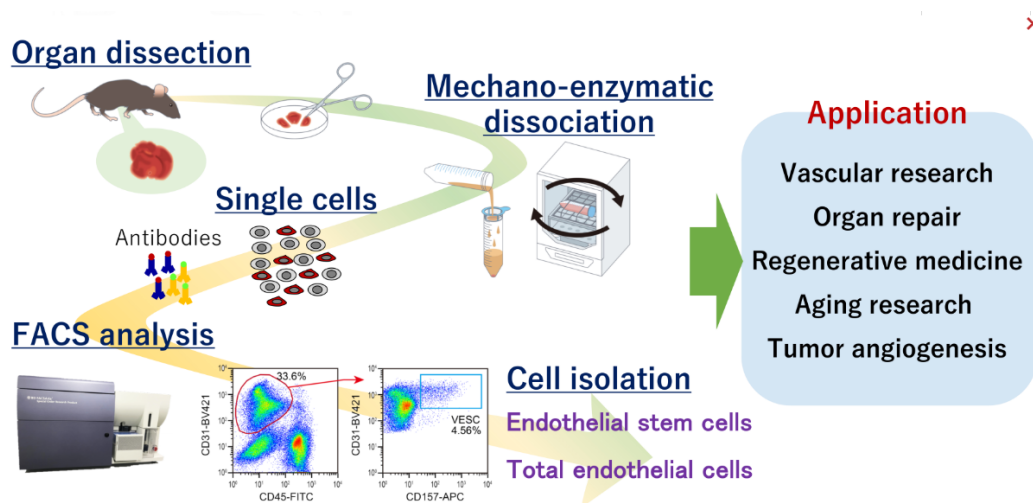


Isolation of tissue-resident vascular endothelial stem cells from mouse liver

Endothelial cells (ECs) are fundamental components of the blood vessels that comprise the vascular system; facilitate blood flow; and regulate permeability, angiogenesis, inflammatory responses and homeostatic tissue maintenance. Accumulating evidence suggests there is EC heterogeneity in vivo. However, isolation of fresh ECs from adult mice to investigate this further is challenging. Nobuyuki Takakura (Signal Transduction, IFRc/RIMD, and Osaka University) and his group describe an easy and reproducible protocol for isolation of different types of ECs and CD157+ vascular-resident endothelial stem cells (VESC) by mechano-enzymatic tissue digestion followed by fluorescence-activated cell sorting. The procedure was established on liver tissue but can be used to isolate ECs from other organs with minimal modification. Preparation of single-cell suspensions can be completed in 2.5 h. We also describe assays for EC clonal and network formation, as well as transcriptomic analysis of isolated ECs. The protocol enables isolation of primary ECs and VESCs that can be used for a wide range of downstream analyses in vascular research.



Article

Journal: Nature Protocols 15, 1066-1081 (2020)

<https://doi.org/10.1038/s41596-019-0276-x>

Title: Isolation of tissue-resident vascular endothelial stem cells from mouse liver.

Authors: Hisamichi Naito*, Taku Wakabayashi, Masako Ishida, Chang-Hyun Gil, Tomohiro

Iba, Fitriana Nur Rahmawati, Shota Shimizu, Mervin C. Yoder*, Nobuyuki Takakura*

(*Corresponding authors)