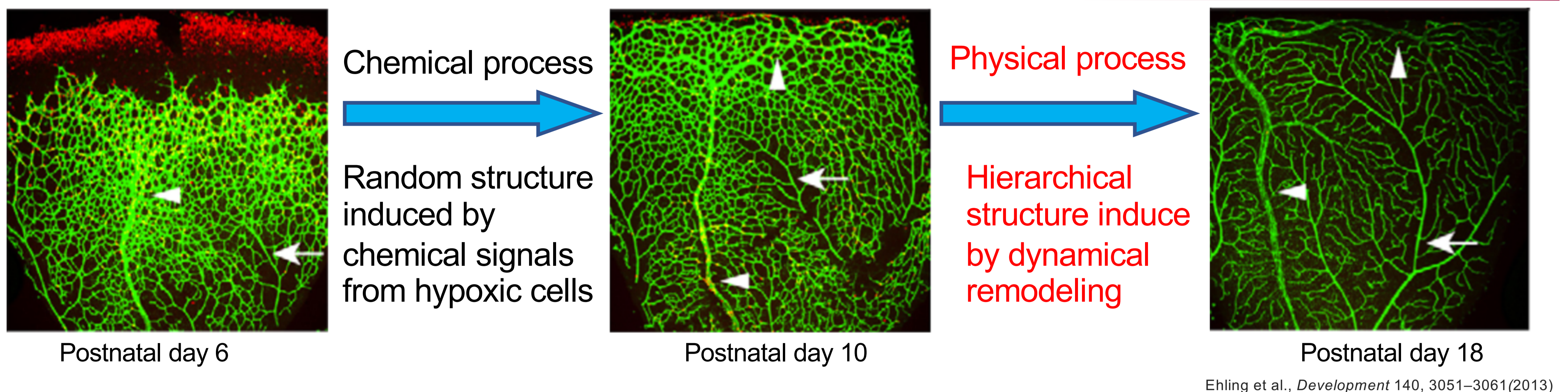


Understanding Remodeling in Biosystems

生産技術研究所 革新的シミュレーションセンター 長谷川研究室
<http://www.ysklab.iis.u-tokyo.ac.jp>

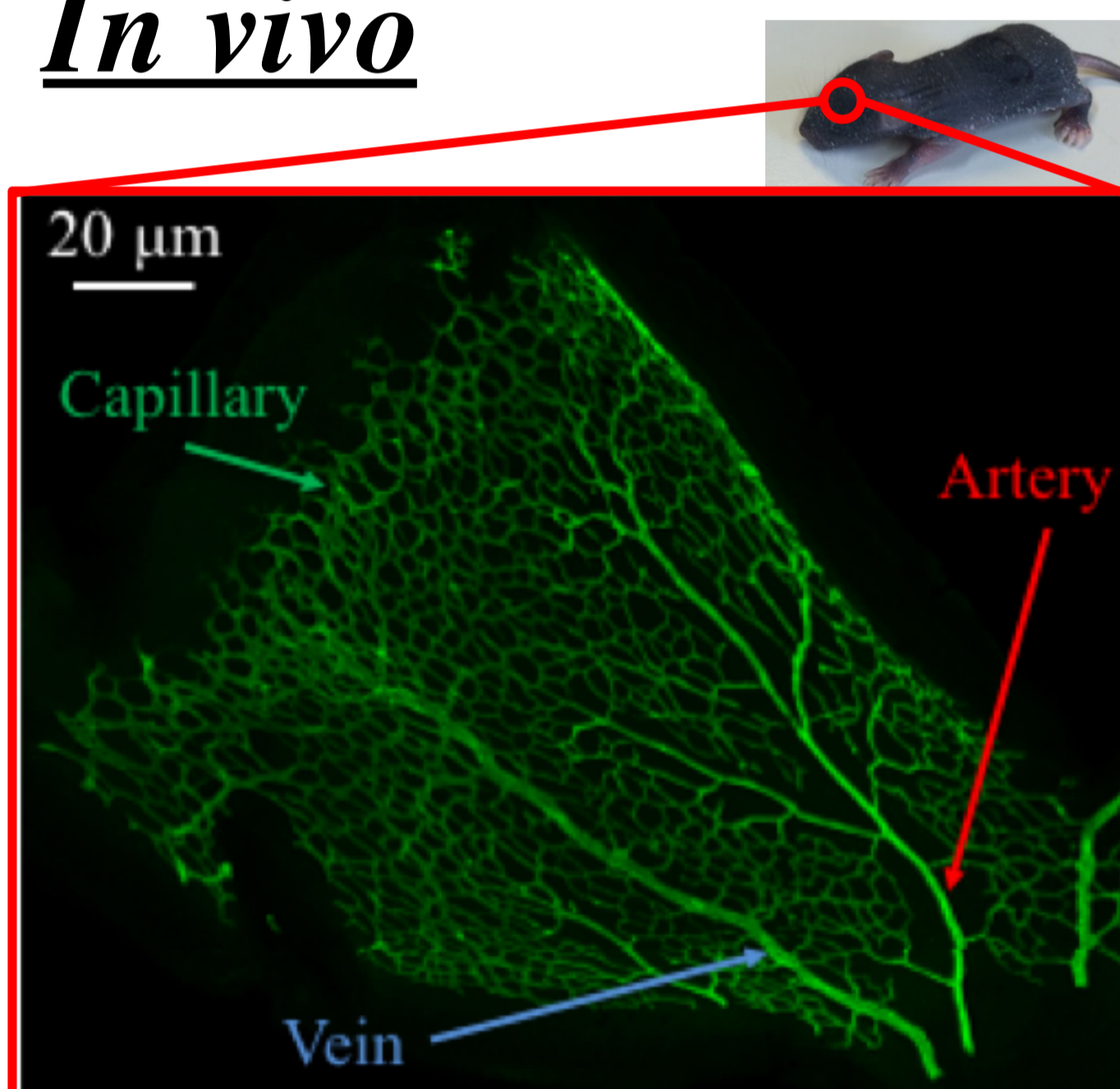
Microvasculature Remodeling



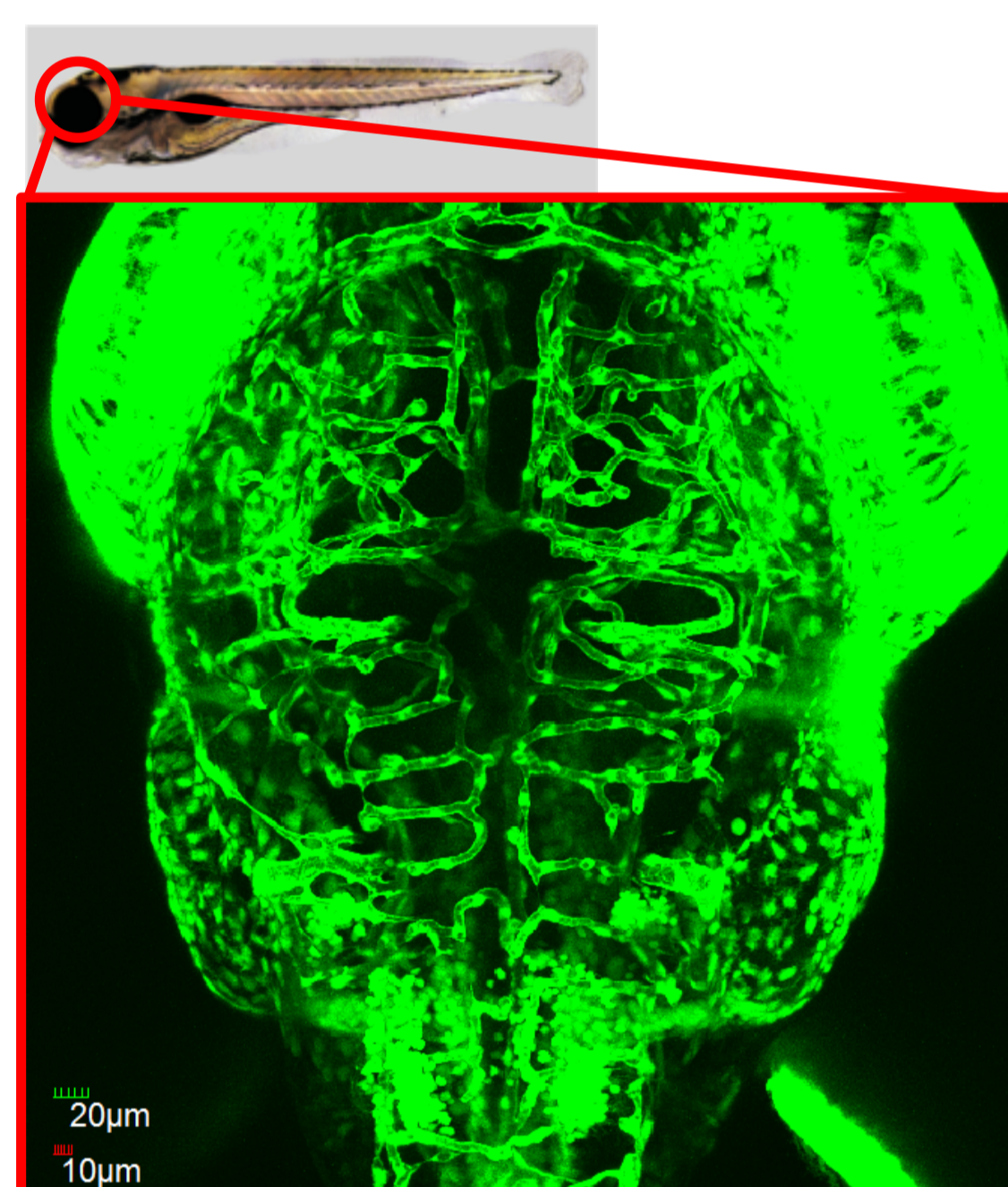
- Understanding remodeling provides new insights in optimal design of flow network
- Response of endothelial cells to ***dynamical factors*** governs remodeling processes
 - Dynamical factors: wall shear stress, pressure, oxygen concentration etc.

Our Objectives & Approaches

In vivo

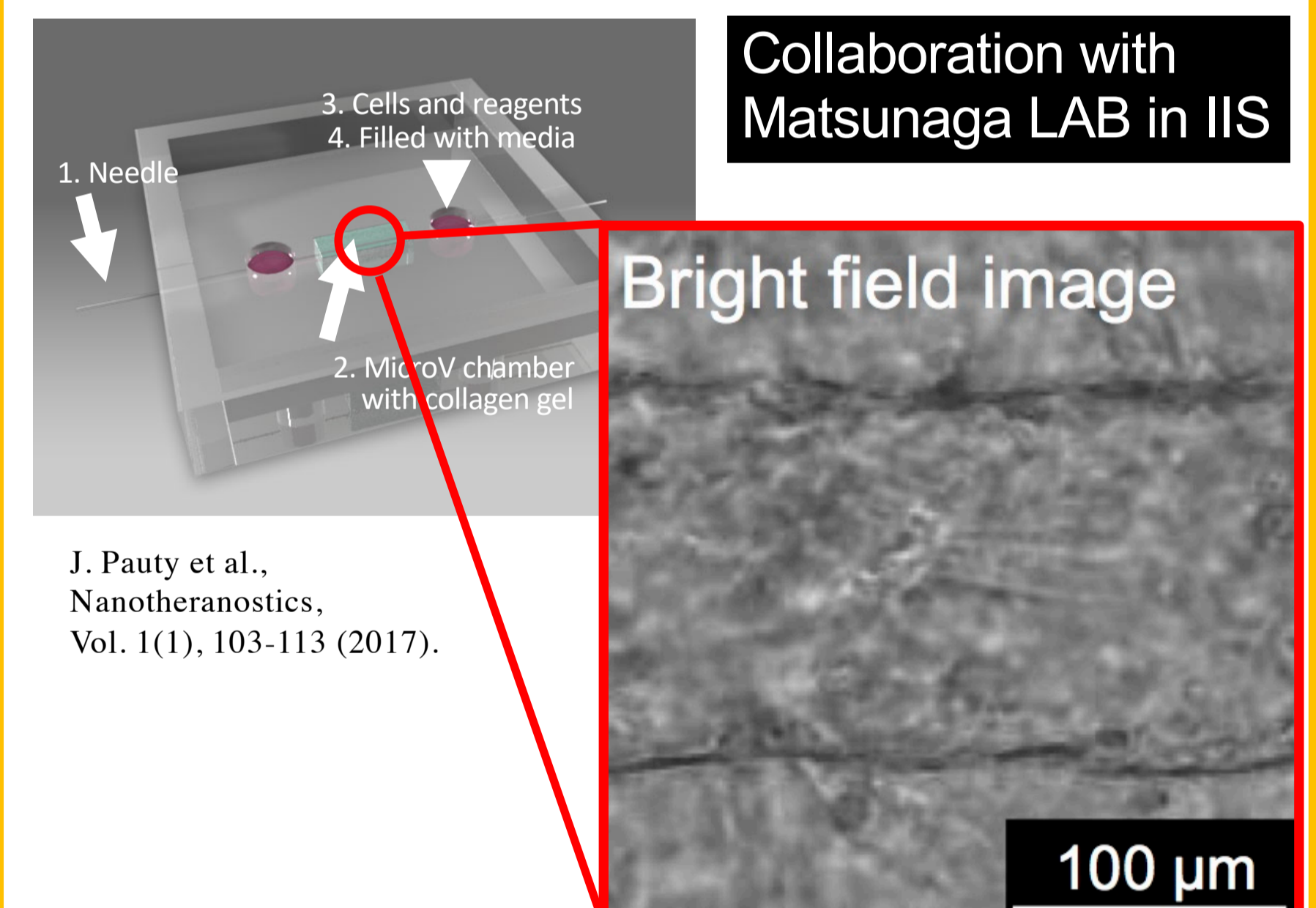


Confocal image of mouse retina



Live imaging of zebrafish brain

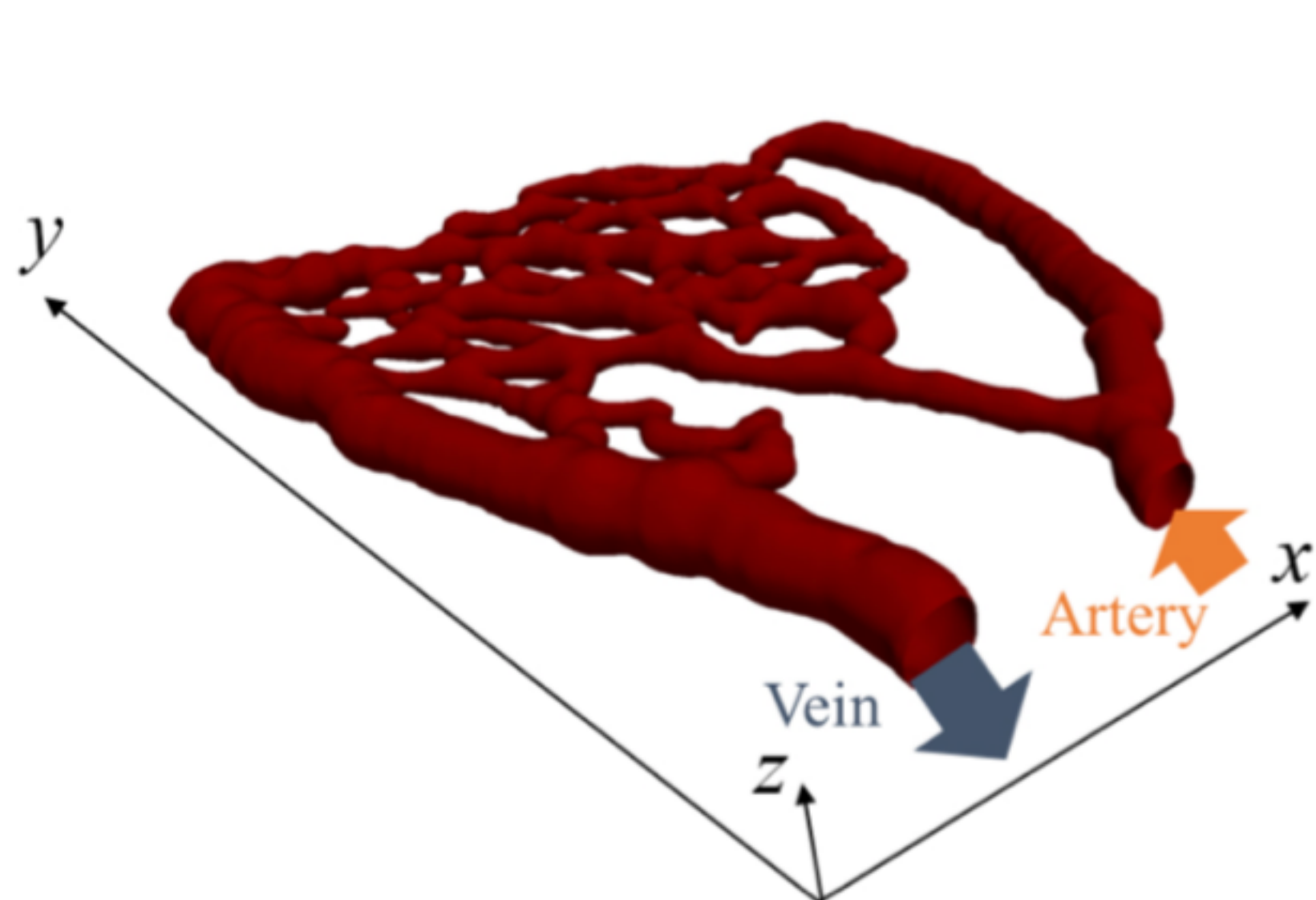
In vitro



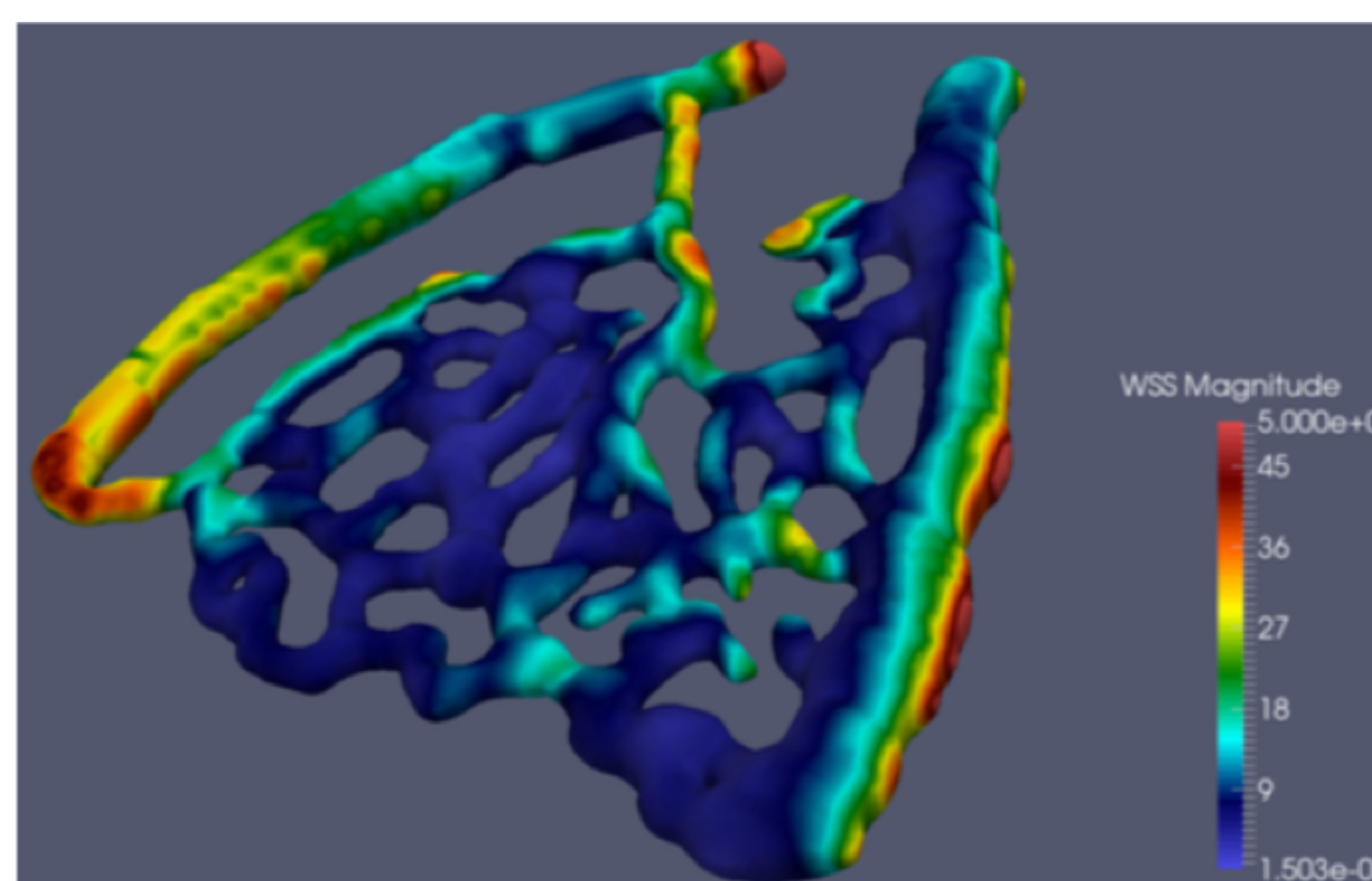
Vascular network reproduce in a micro device

1. 3D Reconstruction of vasculature from series of images
2. Obtaining dynamical factors from numerical simulation of flow and mass transfer
3. Clarifying the relationship between remodeling and dynamical factors

Numerical Simulation of Vasculature



3D reconstruction of vasculature from confocal images



Dynamical factors obtained by simulation (left) wall shear stress, (right) oxygen concentration

