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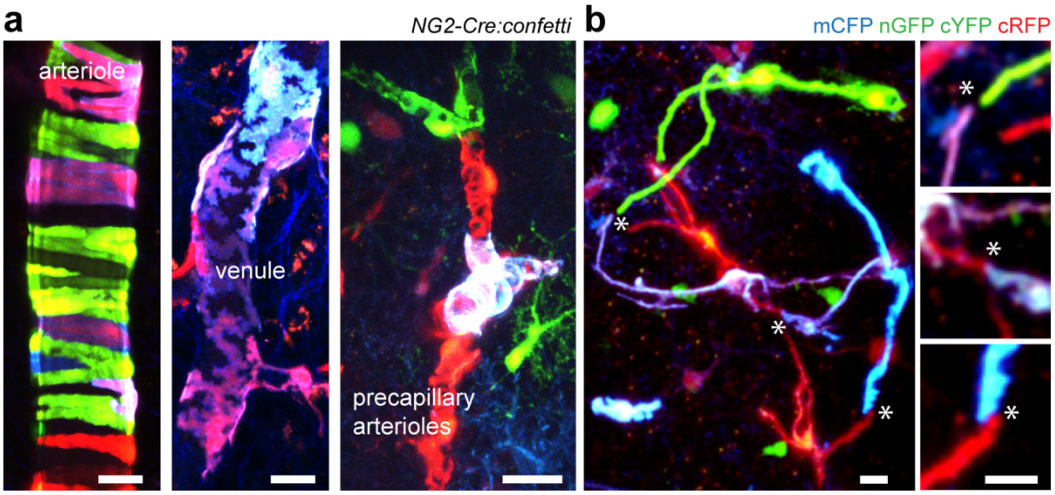
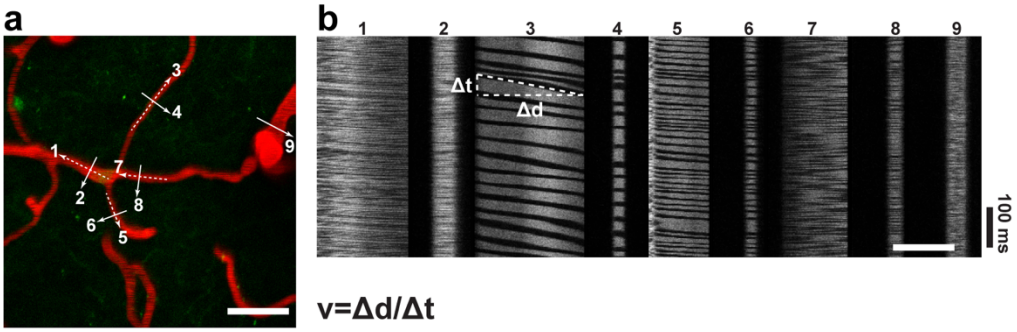
Supplementary information

Imaging and optogenetic modulation of vascular mural cells in the live brain

In the format provided by the authors and unedited



Supplementary Figure 1: Precise mural cell territories revealed by differential fluorescent protein labeling *in vivo*. a, Single vSMCs on an arteriole, venule and pre-capillary arteriole shown by differential fluorescent protein expression in NG2-Cre:Confetti transgenic mice (modified from Hill et al., 2015). Scale bars = 20 µm. **b,** Pericytes are characterized by close apposition of their terminal processes at the transition from one cell to the next (asterisk). Scale bars = 10 µm.



Supplementary Figure 2: Simultaneous measurement of vessel diameter and blood flow velocity at multiple locations along the vascular tree. a, Multiple line scans are positioned either orthogonally (for diameter changes, solid white arrows) or longitudinally along the vessel (for flow velocity changes, dashed white arrows). The arrowheads indicate the scanning direction and the numbers the scanning sequence. **b,** Line scan time lapse traces of scan paths depicted in (**a**) for near simultaneous measurement of vessel diameter and flow velocity at multiple sites along the vascular tree. Red blood cell velocity can be measured by $\Delta d/\Delta t$. Scale bars = 20 µm.