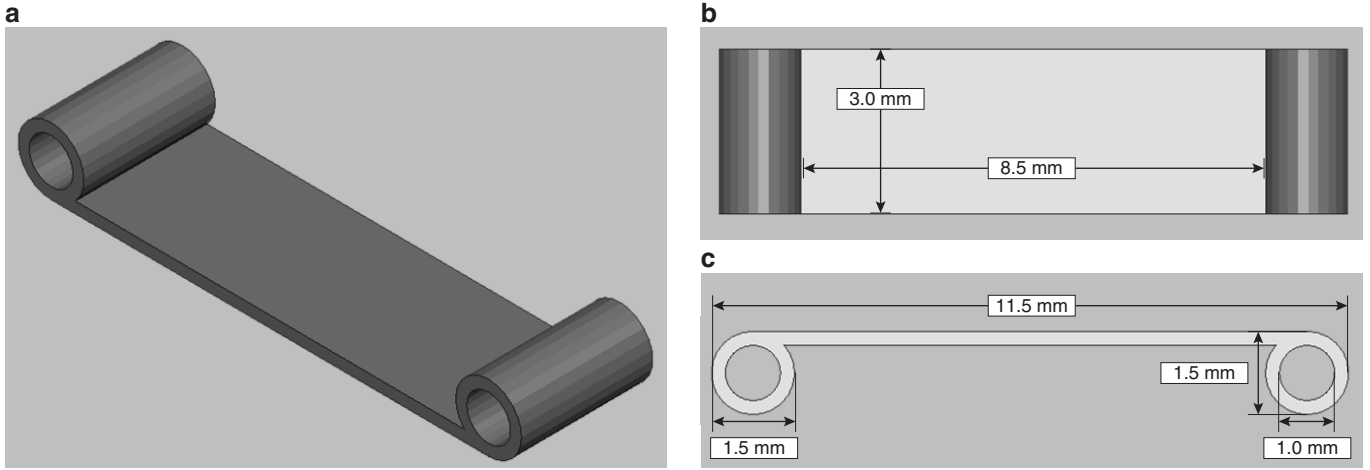


Supplementary Information

An intravital window to image the colon in real time

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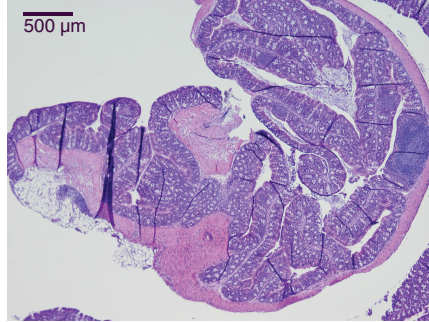


**Supplementary Figure 1. 3D-render of the ferromagnetic scaffold for stabilized colon imaging.** (a) Isometric view of the ferromagnetic scaffold design. Orthographic projection of the ferromagnetic scaffold design with dimensions: (b) top view and (c) front view.

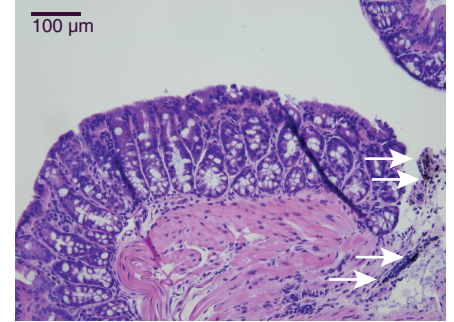
**a** C57BL6/J



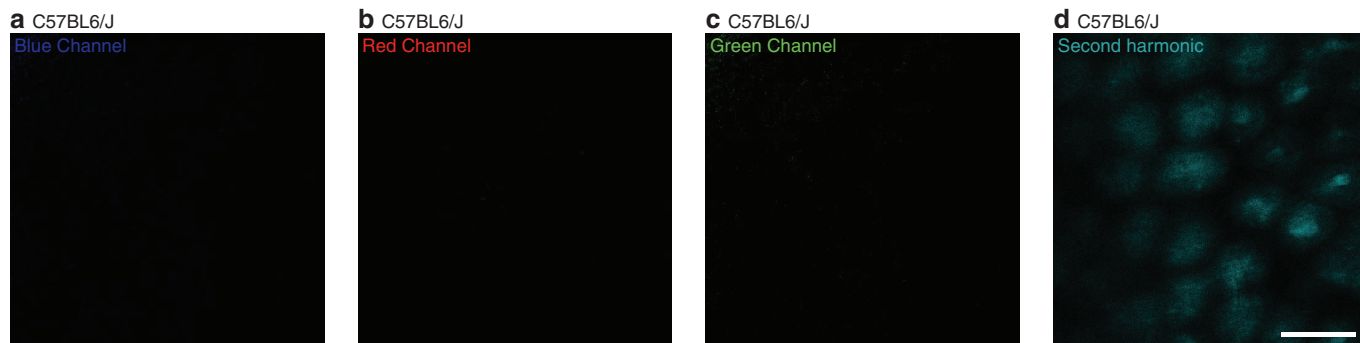
**b** C57BL6/J



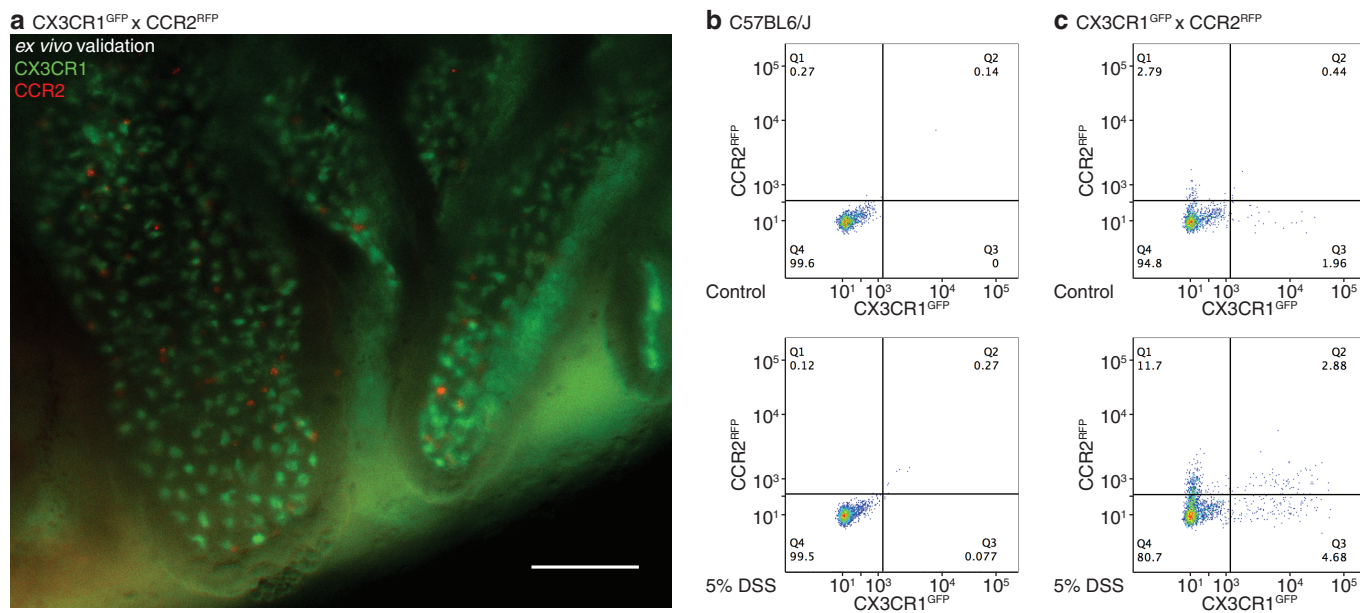
**c** C57BL6/J



**Supplementary Figure 2. Representative images of hematoxylin and eosin staining.** Hematoxylin and eosin stained colon from a C57BL6/J mouse at (a) 20X, (b) 40X, and (c) 100X magnification. Arrows indicate visible tattoo regions in the tissue. All scale bars are as labeled.

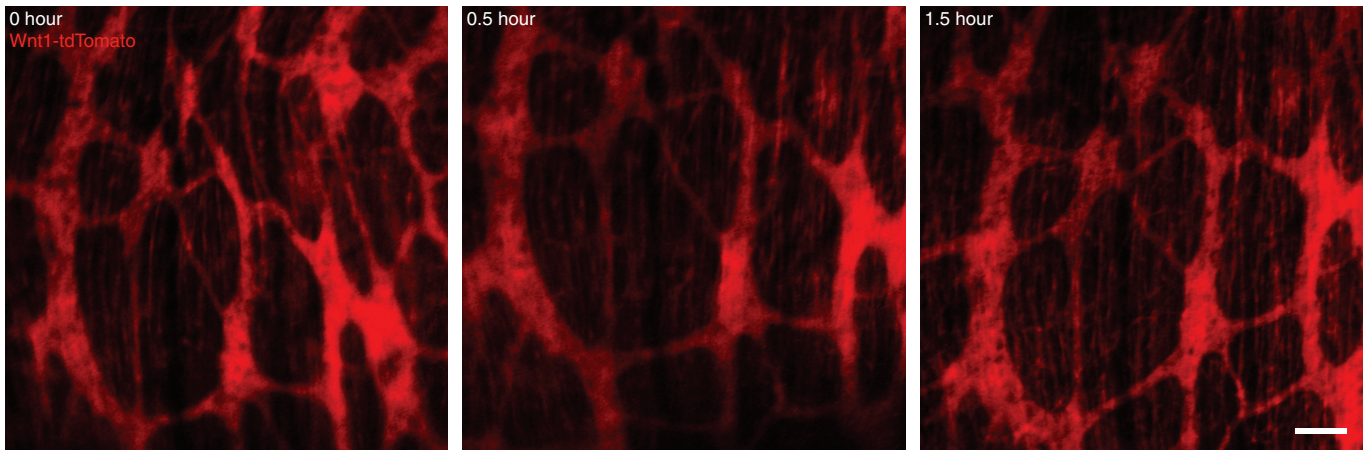


**Supplementary Figure 3. Low autofluorescence in *in vivo* imaging in C57BL6/J mice.** Representative images via the colonic window in C57BL6/J mice in the (a) blue, (b) red, and (c) green channels, as well as (d) the second harmonic generation. Scale bars is 100  $\mu$ m.

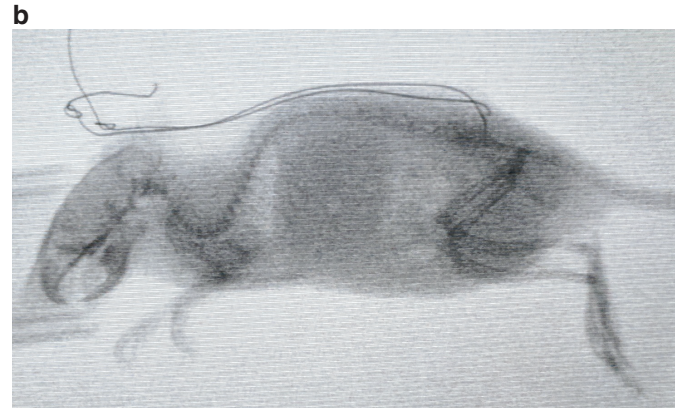
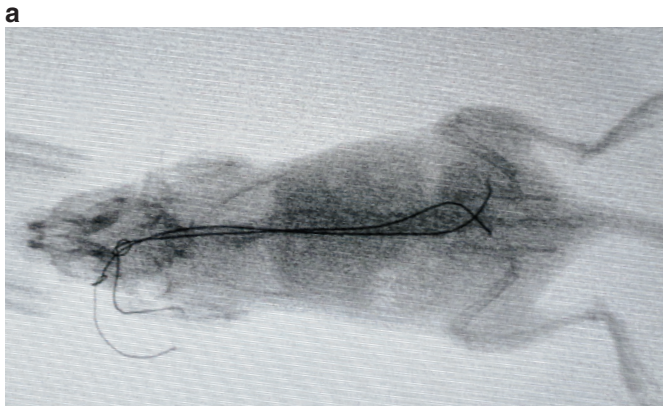


**Supplementary Figure 4. *Ex vivo* CX3CR1<sup>GFP</sup> x CCR2<sup>RFP</sup> DSS inflammation model validation. (a)**

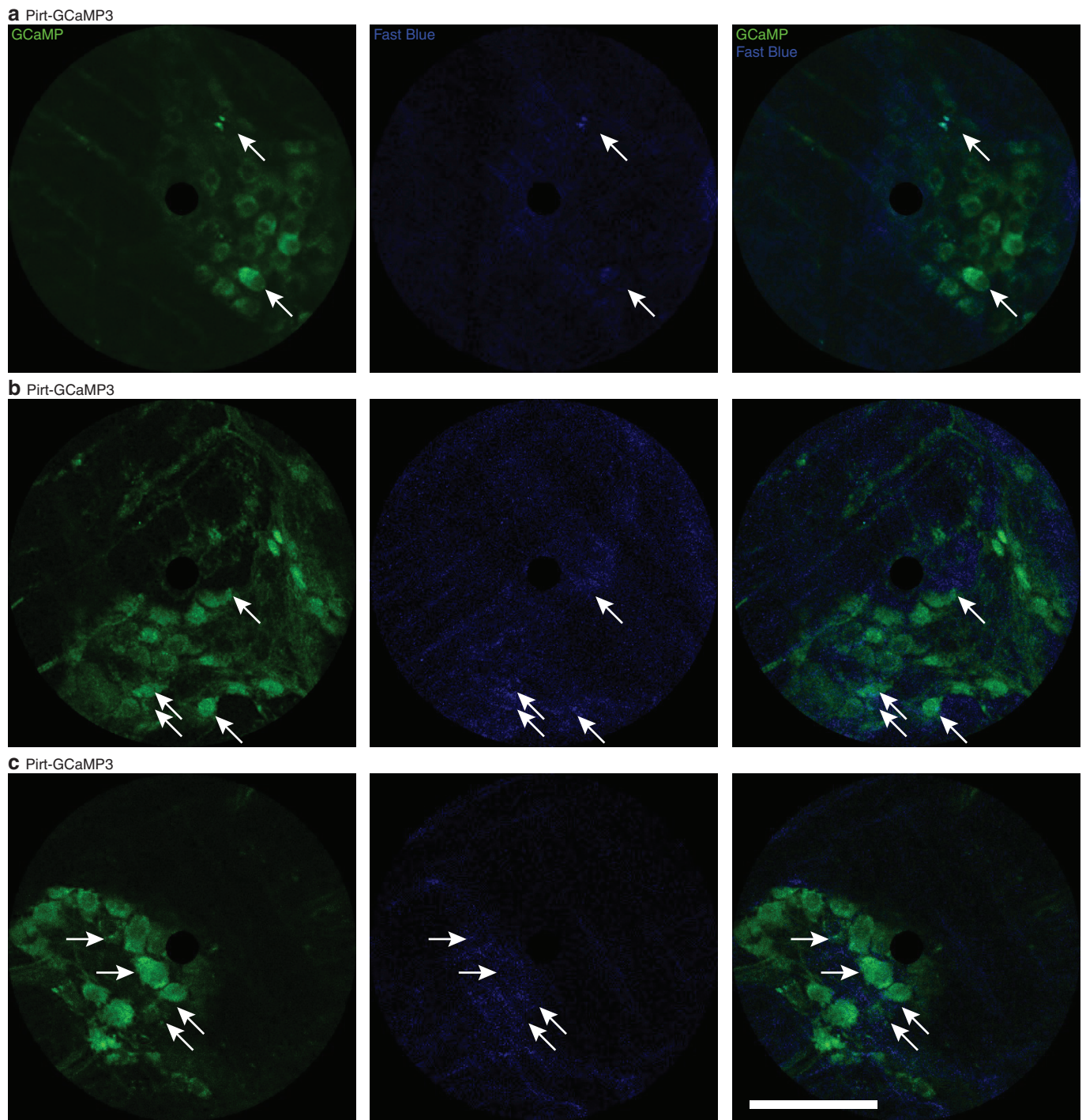
Representative image from CX3CR1<sup>GFP</sup> x CCR2<sup>RFP</sup> excised tissue via fluorescent microscopy showing innate dendritic cells and inactivated monocytes (green) and activated monocytes (red). **(b,c)** Quantification of CX3CR1-positive cells and CCR2-positive cells via flow cytometry from a (b) C57BL6/J mouse, and from a (c) CX3CR1<sup>GFP</sup> x CCR2<sup>RFP</sup> mouse. Scale bar is 100  $\mu$ m.



**Supplementary Figure 5. Colonic myenteric plexus in a Wnt1-tdTomato mouse.** Representative *in vivo* z-stack projections of the myenteric plexus through the colonic window. Images are captured at 0, 0.5, and 1.5 hours. Scale bar is 100  $\mu\text{m}$ .



**Supplementary Figure 6. X-ray fluoroscopy of a mouse with electrical stimulation leads.** (a) Dorsal and (b) lateral view of a mouse with electrical stimulation leads implanted in the S2 intervertebral foramen.



**Supplementary Figure 7. Representative images of Fast Blue labeling in Pirt-GCaMP3 mice *in vivo*.** (a,b,c) Representative images of GCaMP-positive cells (green) and cells labeled with Fast Blue (blue) in three mice. Arrows indicate double-positive cells. All scale bars are 100  $\mu$ m.