Supplemental Document

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Monitoring mouse brain perfusion with hybrid magnetic resonance optoacoustic tomography: supplement

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Supplementary Materials for

Monitoring mouse brain perfusion with hybrid magnetic resonance optoacoustic tomography

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Additional description of MROT system

The MROT system is designed as an insert that operates compatibly in a high-field preclinical MRI scanner. The MROT insert is consisted of a spherical matrix array transducer and an animal support. Fig. S1 shows the experimental setup of MROT and its detailed dimensions. The animal support has three 3D-printed components: two bases in the back and front and a bridging cradle. The bridging cradle is used to support the mouse and features a 'Ω'-shaped groove in which a long tubing filled with warming water can be placed (Fig. S1A). The cradle is connected with both bases using plastic screws, whilst its height is adjustable to guarantee an optimized field-of-view for OAT detection (Fig. S1C).

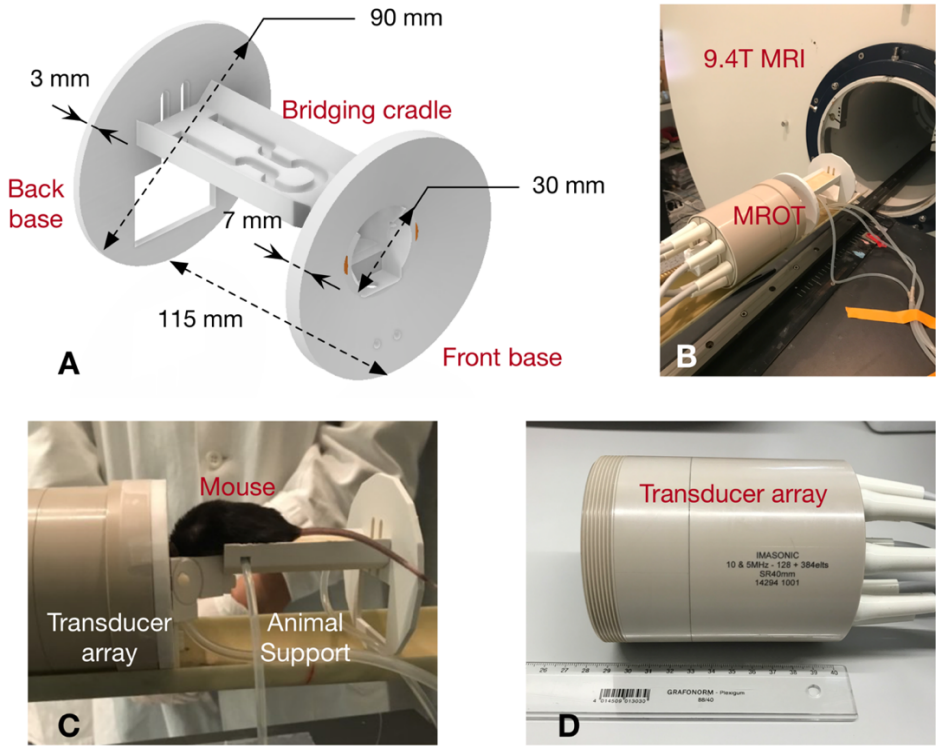

Fig. S1. Experimental setup of MROT. (A) The animal support has three components: a back base, a front base, and a bridging cradle. The detailed dimensions of the support are indicated. (B) MROT insert operates in a 9.4T high-field MRI scanner. (C) Positioning of the mouse during MROT data acquisition. (D) A side-view of the transducer array.

***In vivo* hybrid MROT imaging of contrast agent perfusion dynamics**

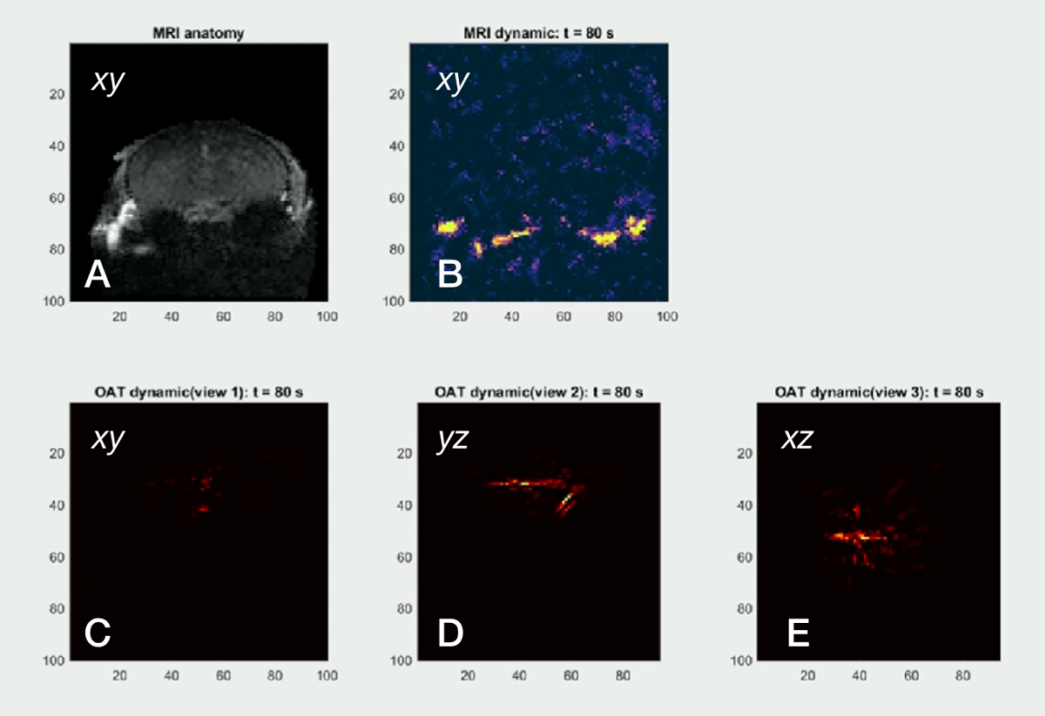

Fig. S2. Hybrid MROT imaging of contrast agent perfusion in a mouse brain. The first row visualizes the xy-plane images of T1-weighted MRI (A) and ToF MRI (B) emphasizing the anatomical information and the concentration variation of GdDOTA. The second row shows ICG-enhanced volumetric OAT images in xy-, yz-, and xz- planes, respectively (C-E). (see **Visualization 1**)

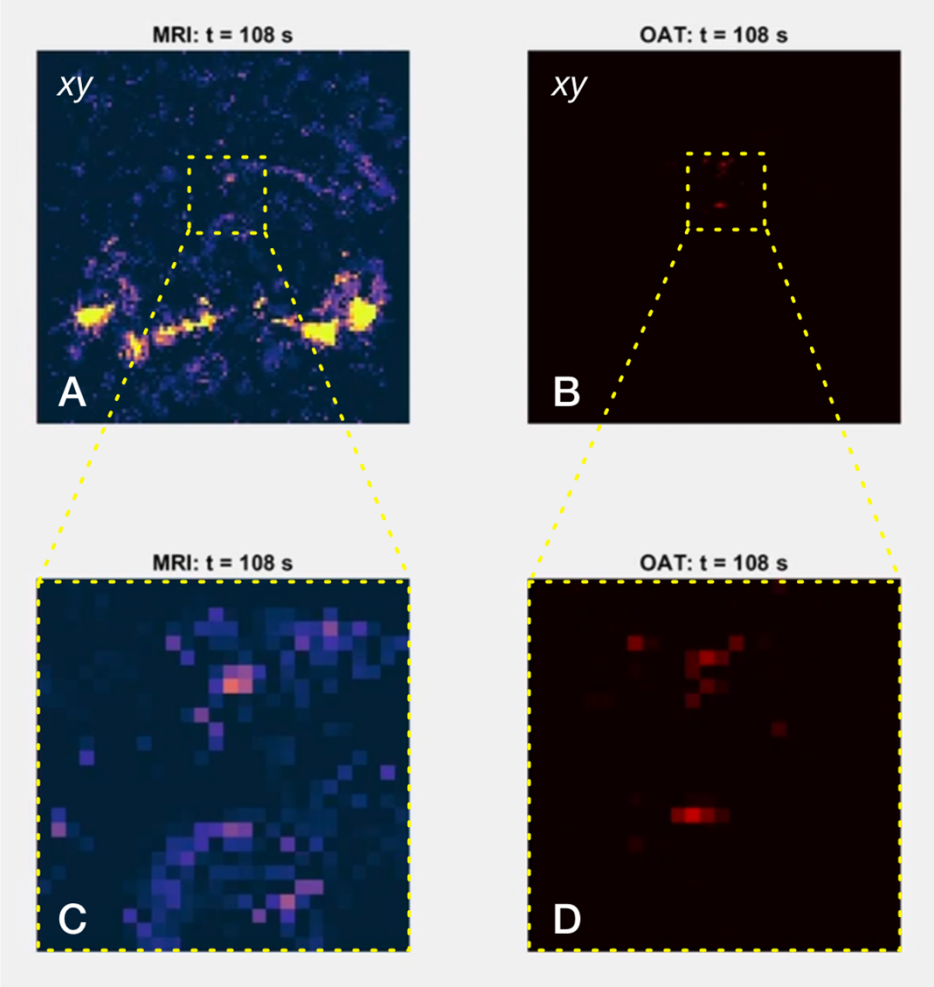

Fig. S3. Simultaneous recording of brain perfusion using ToF MRI and OAT. (A) Dynamic ToF MRI image showing the distribution variation of GdDOTA. (B) Dynamic OAT image showing the distribution variation of ICG. (C) and (D) are the enlarged sections of (A) and (B). (see **Visualization 2**)