**Supporting information for**

# Visualizing vasculature and its responses to therapies in the tumor microenvironment

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**Supporting Table 1: Current window models for intravital imaging of vasculatures.**

| Window organ | Surgery (Y/N) | Study period | Tumor model | Blood vessels visualization method | Stabilizer /device | Microscope | Ref |
|---|---|---|---|---|---|---|---|
| Ear Skin | N | Longitudinal | n/a | FITC-dextran (2000 kDa) and TRITC-ficoll (70 kDa/400 kDa); Dextran (70 kDa/150 kDa/2000 kDa) | n/a | Upright/inverted LSCM and MPLSM | [1, 2] |
| Lymph node | Y | Short-term | n/a | Dextran (500 or 2,000 kDa) | Superglue fixation; Custom-built microscope stage | Upright MPLSM | [3-6] |
| s.c./i.m. tumor in flank | Y | Short-term | CT-26-GFP | PE-anti-CD31 (blood vessel) and PE-anti-CD49b (blood flow) | Secured to a microscope slide by sutures/heated microscope stage | Inverted LSCM and MPLSM | [7] |
| Dorsal skin | Y | Longitudinal | 4T1-GFP or BxPC-3-DesRed s.c. tumor (inoculate at DSWC installation or 10 d) | Oxygen-sensing boron NP (hemoglobin saturation) or FITC-Dextran (2MDa) | DSWC with imaging mount | Upright/inverted WFM and LSCM | [8, 9] |

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|---|---|---|---|---|---|---|---|
| Dorsal skin | Y | Longitudinal | n/a or B16BL6 implanted tumor | FITC-dextran (150 K Da) or eNOStag-GFP (endothelial cells); Cspg4-DsRed (Pericytes)/ Rhodamine PEGylated NPs (blood flow) | Adapted small and light weight-DSWC | WFM or upright MPLSM | [10, 11] |
| Dorsal skin | Y | Longitudinal | s.c. A-07-GFP or s.c. LLC-DsRed2 tumor | TRITC-dextran (155 KDa) or iron oxide–dextran NPs | MRI-compatible DSWC | MRI and inverted WFM or MPLSM | [12, 13] |
| Mammary fat pad | Y | Short-term | MMTV-PyMT orthotopic tumor | Rhodamine-dextran (70-kDa) or TRITC-Dextran (155 kDa) and FITC-dextran (10 kDa) | n/a or custom-built rubber pads or circular imaging window frame with cyanoacrylate adhesive | Inverted SDCM and MPLSM | [14-17] |
| Mammary fat pad | Y | Longitudinal | MTLn3- Dendra2; MTLn3-CFP; MMTV-PyMT-GFP orthotopic tumors | Fluorescent dextran (10Ka) | Coverslip mounted plastic frame (consisting of two plastic rings) | Upright LSCM and MPLSM | [18] |
| Mammary pad | Y | Longitudinal | MDA-MB-231-GFP; MCF-7-GFP orthotopic tumors | Alexa Fluor 647-BSA | Custom-made MRI-compatible MWC and animal holder | MRI and upright LSCM | [19] |

| Window organ | Surgery (Y/N) | Study period | Tumor model | Blood vessels visualization method | Stabilizer /device | Microscope | Ref |
|---|---|---|---|---|---|---|---|
| Brain | Y | Longitudinal | n/a | Texas red dextran, Evans blue, cascade blue dextran, FITC dextran (120 kDa) | Cyanoacrylate glue for fixing the skull and dental cement to cover the exposed skull | LSCM and MPLSM | [20] |
| Brain | Y | Longitudinal (up to 5 months) | D283-MED-Gluc and D341 s.c. tumors | TRITC dextran (2000 Kda); TRITC–BSA (68,000 MW) | Custom-built stereotactic frame. Cyanoacrylate glue, acrylic powder (1:1) to fix the coverslip-bone | Ultrasonography and MPSLM/OCT | [21] |
| Brain | Y | Longitudinal | n/a | n/a | Adapted transparent cranial windows with a tunable screw for controlled compression | MRI, MPLSM and CT | [22] |
| Brain[1,2,3,4] | Y | Longitudinal | n/a | n/a | Thinned skull transcranial window; Reinforced thinned skull window; Transcranial window; Implanted window; Prism-based window; Lens based window | MPLSM/ MPLSM and PET | [23] |

| Window organ | Surgery (Y/N) | Study period | Tumor model | Blood vessels visualization method | Stabilizer /device | Microscope | Ref |
|---|---|---|---|---|---|---|---|
| Bone marrow[4] | Y | Longitudinal | Nalm-6 xenograft (DiD or DiR labeled); n/a | Fluorescent cyanine compounds or AlexaFluor750-ICAM-1, VCAM-1, PECAM-1 and P-selectin; Rhodamine B, Texas red and FITC-dextran (70 kDa) and CFDA-SE-RBCs | Skull window; custom-made stereotactic holder | LSCM and MPLSM | [24-26] |
| Bone marrow | Y | Longitudinal | T-ALL xenograft (PE-human CD45 antibody labeled) | Cy5-Dextran (500 kDa) | Calvarial bone marrow with protective intrasite gel and custom-made stabilizer | Upright LSCM and MPLSM | [27-29] |
| Bone marrow | Y | Longitudinal | LnCap-mCherry, Du145-mCherry, and PC3-mCherry s.c. tumors | TRITC-BSA (MW 67,000); FITC-labeled dextran (150 Kda); Quantum dots 655 | Femur window (filled bilaterally with Ostron Cement-cover slide); Custom-made clamp to fix the chamber | LSCM and MPLSM | [30-33] |
| Lung | Y | Short-term (Up to 3 h) | n/a | Texas Red dextran (70 Kda), Red, fluorescent microspheres (blood flow) | Thoracic suction window attached to a micro-manipulator on the microscope stage | MPLSM | [34, 35] |
| Lung | Y | Short-term (Up to 12 h) | EO771-LG-EGFP metastasis | TRITC dextran (155 kD) | Vacuum stabilized window made of Teflon | Inverted MPLSM | [36] |

| Window organ | Surgery (Y/N) | Study period | Tumor model | Blood vessels visualization method | Stabilizer /device | Microscope | Ref |
|---|---|---|---|---|---|---|---|
| Lung | Y | Longitudinal (Days to weeks) | E0771–EGFP metastasis | VeCad-tdTomato (endothelia); TRITC dextran (155 kD); 2.5 µm fluorescent microspheres (blood flow) | Implantable lung window | Inverted MPLSM | [37] |
| Liver | Y | Short-term (up to 4 h) | n/a | Anti-mouse CD31 (PECAM-1) (endothelial cells); Anti-CD41 (platelets). | PBS-soaked Kimwipes to cover the exposed lobe; Custom-made acrylic platform | Inverted LSCM | [38, 39] |
| Liver | Y | Short-term (Up to 6 h) | SL4-RFP or HT29-RFP metastasis | n/a | Instant adhesive agent and a custom build-organ stabilizing system or agarose embedding | Upright MPLSM | [40, 41] |
| Liver | Y | Short-term | n/a | n/a | Custom-built imaging box with stabilizer | Inverted LSCM and OR-PAM | [42] |
| Liver, spleen, kidney, small intestine, Pancreas | Y | Longitudinal | C26–H2B-Dendra2, C26-Dendra2, C26-mCherry, and C26–LifeAct-GFP metastasis | Texas-Red dextran (70 kDa) | Abdominal imaging window with a custom-built imaging box | Inverted MPLSM | [43, 44] |

| Window organ | Surgery (Y/N) | Study period | Tumor model | Blood vessels visualization method | Stabilizer /device | Microscope | Ref |
|---|---|---|---|---|---|---|---|
| Pancreas | Y | Longitudinal | PANC-1 orthotopic tumor (4 weeks before window installation) | FITC-dextran (2000 Kda), TRITC-BSA | Abdominal wall window made of titanium circular mount with 8 holes on the edge | IVM | [45] |
| Pancreas | Y | Longitudinal | Rip1-Tag2 orthotopic tumor; KPC-EGFP orthotopic tumor | VeCad-tdTomato mice; FITC or TRITC-dextran (50 kDa) | Custom-built imaging window with cyanoacrylate, and a custom-made plastic c-clip to stabilize | MPLSM and laser speckles imaging/ MPLSM and MRI | [46, 47] |
| Ovary | Y | Longitudinal | ES-2-tdTomato or Es-2-eGFP s.c. tumor | FITC-dextran (500 kDa) | Custom-built imaging window with cyanoacrylate, and a custom-made plastic c-clip to stabilize | MPLSM | [48] |
| Mouse embryo | Y | Longitudinal | n/a | n/a | Custom-built abdominal window | MPLSM | [49] |

**Footnotes:** Mouse models are used except for 1: ferret, 2: non-human primate, 3: pig and 4: rat. CT-26-GFP: mouse colon carcinoma; 4T1-GFP: mouse mammary carcinoma; BxPC-3-DesRed: human pancreatic adenocarcinoma; B16BL6: mouse melanoma; A-07-GFP: human melanoma; LLC-DsRed2: mouse Lewis lung carcinoma; MMTV-PyMT: (mouse mammary tumor virus-polyoma middle tumor-antigen) mouse model of breast cancer; MTLn3-Dentra2/MTLn3-CFP: highly invasive rat breast adenocarcinoma; MDA-MB-231-GFP: human breast adenocarcinoma; MCF-7-GFP: human breast adenocarcinoma; D283-MED-Gluc and D341: human medulloblastoma; Nalm-6: human B cell precursor leukemia; T-All: T-cell acute lymphoblastic leukemia; LnCap-mcherry: (Lymph Node Carcinoma of the Prostate) human prostate adenocarcinoma; Du145-mCherry: human prostate carcinoma with androgen receptor (AR) expression; PC3-mCherry: human prostate adenocarcinoma; EO771-LG-EGFP/EO771-EGFP: mouse mammary carcinoma; SL4-RFP: mouse colon carcinoma; HT29-RFP: human colorectal adenocarcinoma; C26-H2B-Dendra 2/C26-Dendra2/C26-mCherry/C26-LifeAct-GFP: mouse colon carcinoma; PNAC-1: pancreas ductal adenocarcinoma; Rip1-Tag2 mice: mouse pancreatic islet cell carcinoma; KPC-EGFP: mouse pancreatic ductal adenocarcinoma; ES-2-tdTomato or ES-2-eGFP: human ovarian carcinoma.

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