

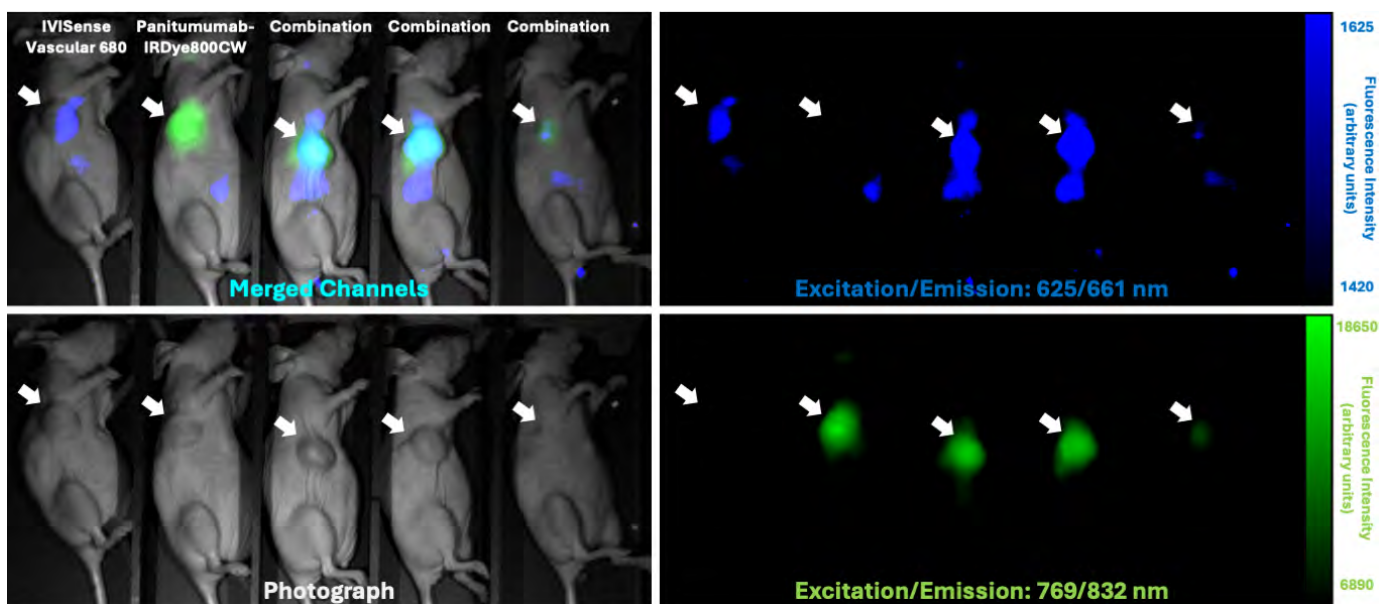


PRECLINICAL OPTICAL IMAGING

Preclinical OI (optical imaging), including bioluminescence and fluorescence, enables scientists to explore various aspects of molecular, cellular, and tissue biology and physiology in laboratory animals. Some key areas of interest include gene and protein expression, tumor growth, tissue vascularity, cell tracking, and fluorescence-guided surgery. The MILabs uSPECT⁶/CT/OI system in the SAIF enables *in vivo* and *ex vivo* (in vitro) OI acquisitions and is capable of imaging up to 10 mice simultaneously during 2-dimensional (2D) OI sessions. This system can also combine OI with computed tomography for 2D and 3D anatomical (fluorescence tomography) imaging. Multi-channel OI capabilities enable spectral resolution of distinct bioluminescence or fluorescence signals within animals (see figure). The MILabs uSPECT⁶/CT/OI instrument has the following multi-channel options: **Emission** (nm): 586, 615, 631, 661, 775, 831, Open **Excitation** (nm): 500, 527, 543, 561, 575, 586, 605, 625, 640, 710, 769, blocked

Key parameters for OI acquisition:

- **Filter positions** – determines the wavelength of acquisition (emission); also determines the wavelength of excitation for fluorescence applications.
- **Exposure time (ms)** – duration of exposure (including fluorescence excitation), enhancing the image, although setting the exposure time too long results in image saturation that hinders quantitative analysis.
- **Preamp Gain and Binning** – controls image resolution and dynamic range (influences sensitivity).
- **Iris setting (f/stop)** – controls image sensitivity and sharpness.

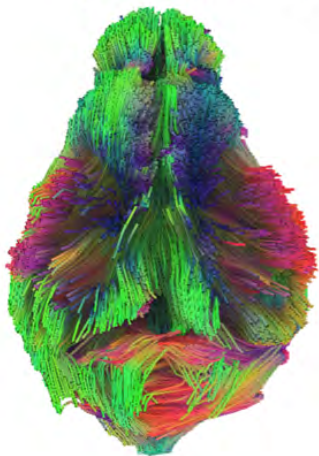


Multi-color fluorescence imaging of BT474 xenografts. Athymic nude mice bearing BT474 breast cancer xenografts (indicated by white arrows) were injected intravenously with IVISense Vascular 680 (far-left mouse), panitumumab-IRDye800CW (middle-left mouse), or both agents combined (center, middle-right, far-right mice) 24 h prior to imaging on the MILabs-OI instrument. Fluorescence images were acquired for 5 min using the fluorescence excitation/emission channels shown above. Single-channel and merged images were processed in ImageJ (v1.53k).



FEATURED IMAGE OF THE QUARTER

Tractography of a scanned mouse with high Spatial resolution dMRI



Template brain



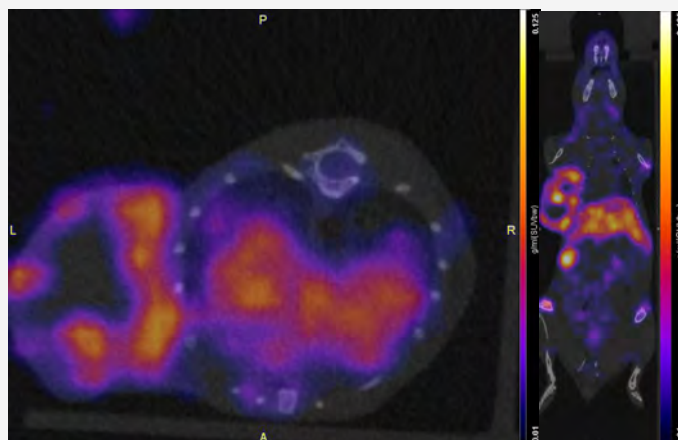
DTI in Mouse Brains for Neurological Studies

Collection of 246-directions multi-shell (at b-values of 0, 500, 1000, 1500, and 3000s/mm², 81 directions at each b-value except b=0) diffusion weighted MRI (dMRI) on 9.4T Bruker® scanner to perform tractography and derive conventional and free-water corrected dMRI measures in various mouse brain regions using ALLEN Brain Atlas. The figure above shows the posterior and anterior view of whole brain white matter (WM) tracts that closely resembles the WM tracts of a template brain. This development allows us to study changes in WM morphology during neuropathological events. Photo courtesy of Dr. Mishra.

FEATURE SPOTLIGHT



CD68+ TRACER DEVELOPMENT



Dr. Marquez-Nostra has developed SPECT tracer [¹¹¹In]In-CHX-A"-DTPA-αCD68 to image CD68+ tumor associated macrophages (TAMs) in subcutaneous xenograft RCC mouse models. SPECT/CT was performed in conjunction with DCE-MRI to better observe the heterogeneous uptake of tracer in the tumor. SPECT/CT was performed with the Small Animal Imaging Facility's U-SPECT6-μCT. Images courtesy of Dr. Marquez-Nostra.



USEFUL LINKS

➔ UAB SAIF

Homepage for the Small Animal Imaging Facility core.

➔ SAIF FAQ's

The Small Animal Imaging Facility's Frequently Asked Questions

➔ TRAINING FORMS

Download training material for submission prior to scheduling imaging.

➔ PRE-CLINICAL IMAGING CALENDAR

Check for any available time slots for imaging modalities.

➔ DEPARTMENT OF RADIOLOGY

Homepage for UAB's Department of Radiology.

➔ O'NEAL COMPREHENSIVE CANCER CENTER

Homepage for O'Neal Comprehensive Cancer Center at UAB.

➔ O'BRIEN CENTER

Homepage for O'Brien Center for Acute Kidney Injury Research.

➔ UAB CYCLOTRON FACILITY

Homepage for UAB's Cyclotron Facility.

DID YOU KNOW?

You can apply for the **O'Neal Shared Resource Voucher** for cancer related imaging studies.

The goal of this voucher is to support the use of an O'Neal Shared Resource in carrying out an analysis that could lead to a new direction in cancer research in the investigator's laboratory.

Apply here: <https://www.onealcanceruab.org/giving/oneal-invests/>

SAIF's SARRP Advanced Training will be held on July 25th and 26th. Please contact Emily Helman (eehelman@uabmc.edu) to schedule your training.



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NUCLEAR

OPTICAL

MRI

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IMAGING FACILITIES

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WTI 630D

MRI 9.4T Imaging Suite
LHL B15, 934-0265

Volker Hall Imaging Suite
VH B21A, 975-6466

SAIF MODALITY PRICING

* Labor charges are \$45 per hour (for each personnel), when assisted during imaging.

Prices effective 01/01/2022.

* Training is available on some modalities, free of charge.

* Accounts will be auto billed after 7 days of no response to invoices.

MODALITY	COST	INSTRUMENT
Bioluminescence	\$60/hour, No substrate \$80/hour, Core substrate	IVIS Lumina III
Fluorescence	\$60/hour	Custom Leica Microscope with Nuance spectral camera
		IVIS Lumina III
Ultrasound	\$75/hour	Vevo 660
MRI	\$200/hour	Bruker 9.4T
SPECT/CT	\$200/hour + dosing	U-SPECT ⁶ - μ CT
PET/CT	\$200/hour + dosing	Sofie GNEXT PET/CT
Specialty Fluorescent Imaging	\$100/hour	Li-Cor Pearl Impulse
		Luna/SPY Systems
		FMT 4000
Flow Cytometry	\$35/hour, non-assisted	Attune Flow Cytometer
	\$50/hour, assisted	
Staff Image Analysis/Assistance	\$45/hour	

*NON-CANCELLATION POLICY:

If user is not present at scheduled appointment time without prior notification of cancellation, user will be charged an **hourly-use fee** for that instrument.

IMAGE SUBMISSIONS

Submit images that you would like featured in the newsletter to jordynlawrence@uabmc.edu. Please include PI's name, modality, brief experiment summary, and species.

PUBLICATION REFERENCE

Please acknowledge support of SAIF services in grants and publications by citing the **O'Neal Cancer Center Grant P30CA013148**.

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For data obtained with the MRI, please cite **S10 instrumentation grant S10OD028498-01**.

For data obtained with the SARRP, please cite **S10 instrumentation grant S10OD034408-01**.

For data obtained with the U-SPECT, please cite **S10 instrumentation grant S10 OD030465-01**.