UAB SAIF ISSUE 27 2025

PULSE WAVE VELOCITY

Pulse wave velocity (PWV) is a commonly used biomarker to assess early atherosclerosis (plaque development in the arteries). PWV describes how quickly the pressure pulse generated by each heartbeat travels along the artery. Plaque development in the arteries leads to a stiffer and potentially narrower artery that will increase pulse pressure, leading to a higher PWV. This stiffness usually occurs before any symptoms are noticed by the patient.

Local PWV can be assessed non-invasively with the use of MRI. In this study, we utilized a dynamic velocity mapping sequence, acquiring data at multiple points along the ascending and descending aorta, the main artery carrying blood away from the heart. With the synchronization of R-R interval ECG gating, we can estimate the time when the peak of the pulse arrives at each specified location. To calculate PWV, cross-correlation analysis techniques are utilized to estimate the small time delay (lag) of the pulse velocity arrival time between two sections. Combining this lag time with the distance the blood traveled, we can estimate the velocity at which the pulse propagates.

The SAIF has since performed repeatability studies to ensure the technique produces consistent and reliable results. SAIF's 24-hour test-retest repeatability assessment of this protocol indicated acceptable repeatability with an average of 6.13% error, 0.24±1.68 cm/s mean difference between days, and 97% of test-retest differences fitting within Bland Altman limits of agreements. These results depict a reliable method for non-invasive aortic stiffness measurements in future preclinical studies.

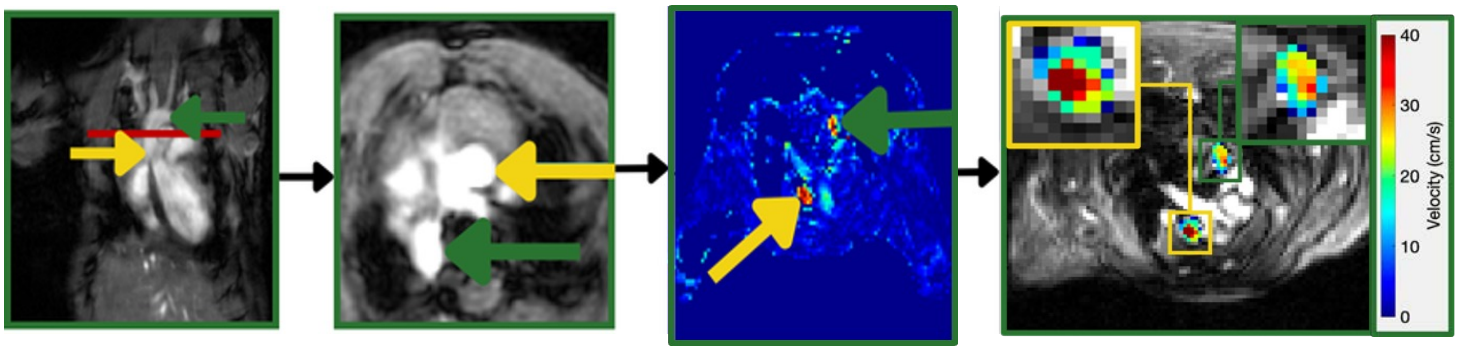


Figure 1. Analysis pipeline images resulting in a color map of the pulse as it travels through sections 1 and 2.

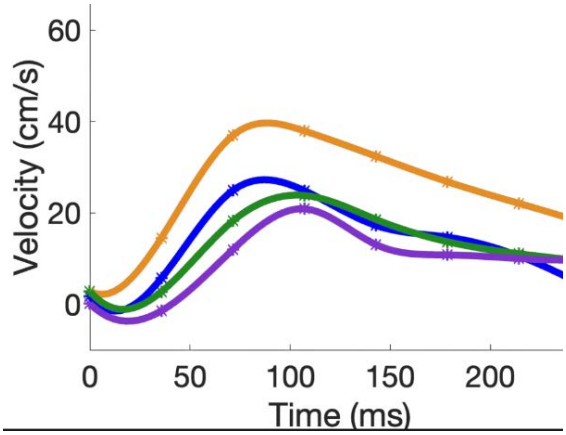
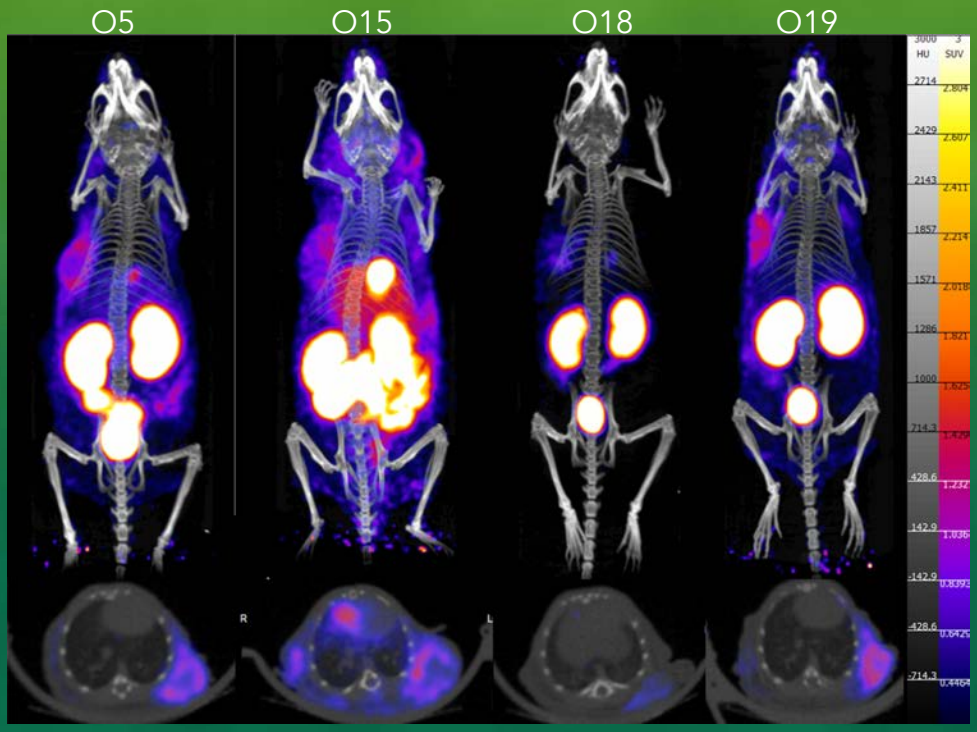


Figure 2. A velocity plot of each section's blood flow velocity through the R-R Interval

Findings from these efforts have been presented at the North American Artery Conference, demonstrating both methodological rigor and translational relevance. These MRI-based methods of measurement were developed in collaboration with Dr. Jennifer Pollock's research team.

FEATURED IMAGE OF THE QUARTER



PET imaging allows for rapid drug development. Head-to-head imaging of four drugs developed by Oncurie shows clear differences in tumor uptake and clearance, which allows for more clarity in the drug development process. Image courtesy of the Lapi Lab and Oncurie.

FEATURE SPOTLIGHT

TREM2 promotes lung fibrosis via controlling alveolar macrophage survival and pro-fibrotic activity

Huachun Cui [#1], Sami Banerjee [#1], Na Xie [1], Musaddique Hussain [1], Ashish Jaiswal [1], Hongli Liu [1], Tejaswini Kulkarni [1], Veena B Antony [1], Rui-Ming Liu [1], Marco Colonna [2], Gang Liu [3]

Dr. Veena Antony and Dr. Gang Liu recently published *TREM2 promotes lung fibrosis via controlling alveolar macrophage survival and pro-fibrotic activity*. Both Drs. Antony and Liu are valued users of the Small Animal Imaging Facility.

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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?

LAST CALL: SAIF USER SURVEY

Thank you for your continued support of the Small Animal Imaging Facility. Your opinion matters to us, and we believe that your insights will make a significant contribution to our ongoing efforts to meet the needs and expectations of our users.

Please click the link below to respond to a brief survey about your experience with The Small Animal Imaging Facility.

https://docs.google.com/forms/d/e/1FAIpQLScH7ri9sGawScEGPG7cbiwiS_hN5ZCo9djFdKf1UUX09s4S_w/viewform?usp=dialog

The survey will close on October 31st.

CONTACT INFO

ULTRASOUND
MRI

Facility Director
Anna Sorace
Ph.D.
agsorace@uab.edu

NUCLEAR

Suzanne Lapi
Ph.D.
lapi@uab.edu

OPTICAL

Jason Warram
Ph.D.
mojack@uab.edu

MRI

Mark Bolding
Ph.D.
mbolding@uab.edu

SAIF LAB PERSONNEL

Associate Director/Operational Manager
Sharon Samuel
ssamuel@uab.edu

Program Manager
Jordyn Wheeler
jlaw9413@uab.edu

Research Scientist Senior
Rodrigo Queiroz
rgguimar@uab.edu

Research Scientist Senior
Emily Helman
helmane@uab.edu

Staff Researcher
Annye Bennett
annye@uab.edu

Staff Researcher
Paris Maddox
pmadd@uab.edu

MAIN LAB

Volker Hall Laboratory
1670 University Blvd.
Rm. G082G, 975-6465

IMAGING FACILITIES

WTI Imaging Suite
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 $50 per hour (for each personnel), when assisted during imaging.

Prices effective 06/01/2025.

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

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

MODALITY	COST	INSTRUMENT
Bioluminescence	$65/hour, No substrate $85/hour, Core substrate	IVIS Lumina III
Fluorescence	$65/hour	Custom Leica Microscope with Nuance spectral camera
		IVIS Lumina III
Ultrasound	$80/hour	Vevo 660
MRI	$210/hour	Bruker 9.4T
SPECT/CT	$210/hour + dosing	U-SPECT^{6}-µCT
PET/CT	$210/hour + dosing	Sofie GNEXT PET/CT
		Mediso nanoScan PET/CT
Specialty Fluorescent Imaging	$105/hour	Li-Cor Pearl Impulse
		Luna/SPY Systems
		FMT 4000
Flow Cytometry	$40/hour, non-assisted $55/hour, assisted	Attune Flow Cytometer
SARRP Irradiator	$150/hour	Xstrahl SARRP 200 Irradiator
Staff Image Analysis/Assistance	$50/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

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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.