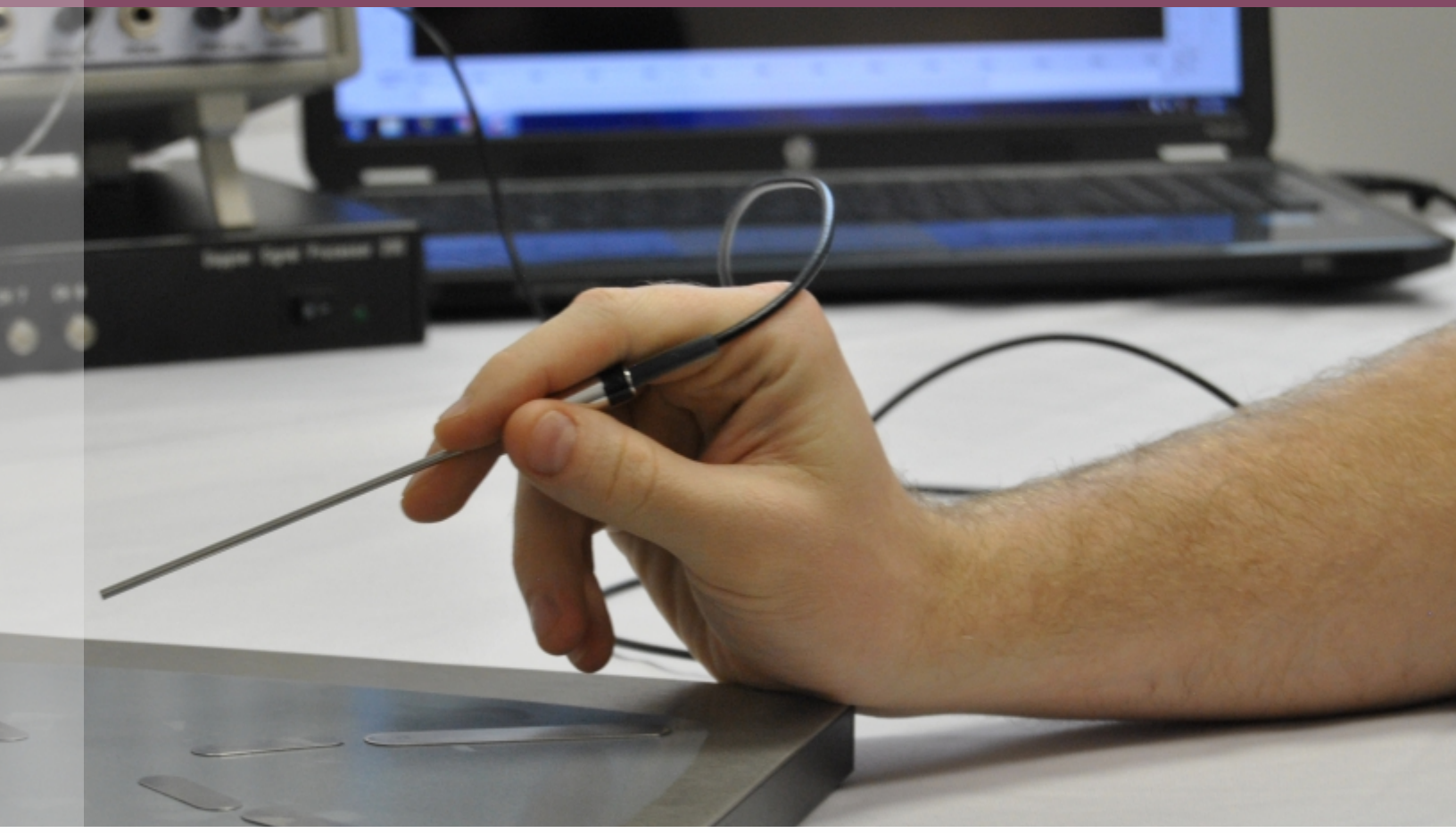
Non-Invasive Assessment of Cardiac Function in Rodents Using Doppler Flow Velocity Workshop



insidescientific

Welcome to the InsideScientific Non-Invasive Assessment of Cardiac Function in Rodents Using Doppler Flow Velocity Workshop, proudly hosted in conjunction with Dr. Anilkumar K Reddy at Baylor College of Medicine, Houston, Texas.

Our professional training program offers both novice and experienced research scientists with the knowledge and skills required to excel their cardiac function and hemodynamic research in rodent models to a new level.

During this course, participants will have an opportunity to learn or review the foundations of carrying out a successful noninvasive cardiac research protocol including proper sedation, assessment of electrocardiogram, temperature control, and respiration if needed. In addition to these fundamentals, attendees will learn how to measure blood flow velocity from various sites in the cardiac and systemic circulatory system, and coronary left main artery, using non-invasive Doppler Flow Velocity measurements, all while simultaneously tracking vital physiological signals including heart rate, respiration rate and core body temperature. Utilizing these functional measurements is essential for the effective study of various cardiovascular and hemodynamic disease models, including hypertension, atherosclerosis, arterial stiffness, cardiac hypertrophy and heart failure models, to name a few. In addition to learning best-practices on monitoring and measurement techniques, attendees will also have an opportunity to discuss experimental design and research objectives with course instructors.

Course Sponsors

Scintica: INSTRUMENTATION

INDUS INSTRUMENTS

Course Information

Location: Baylor College of Medicine
Medicine - Cardiovascular Sciences
F663 Fondren Brown Building
6535 Fannin Street
Houston, Texas 77030

Head Instructor:

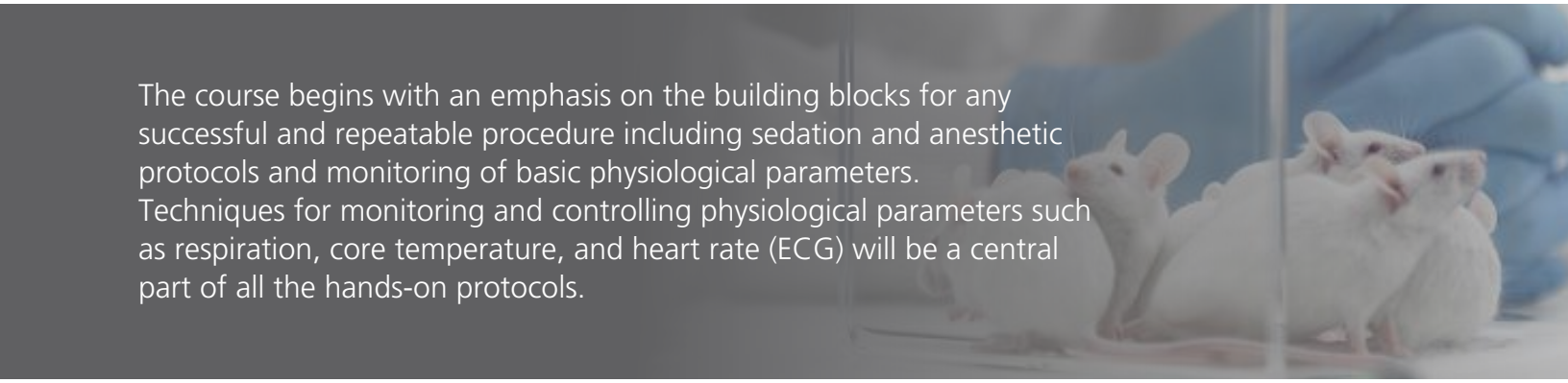
Dr. Anilkumar K Reddy, Ph.D.
Assistant Professor, Medicine-Cardiovascular Sciences, Baylor College of Medicine

Dr. Reddy's research interests include evaluation of cardiac and vascular mechanics in senescent, disease, transgenic, and surgical models of mice. Some of the mouse models he studies include atherosclerosis, dwarf, myocardial infarction/remodeling, pressure overload, hypertension, absent vascular tone, and absent steroid receptor coactivator-1, with the main goal being to translate what is learned in mice to humans for early detection and screening.

Using noninvasive methods, such as pulsed Doppler Flow Velocity measurements as well as imaging methods, animals are phenotyped as abnormalities develop and progress, and their cardiovascular system is monitored as it adapts and compensates for the deterioration of function or for missing or over-expressed proteins. The main goal is to translate what is learned in mice to humans for detection and screening of cardiovascular diseases at an early stage when potential therapies can be most effective at preventing disease progression. Dr. Reddy's research dates back to 1997 when he began working with Dr. Craig Hartley in developing the first Doppler Flow Velocity signal acquisition and processing systems. Using the custom-built sensors and devices the laboratory adapted these measurement techniques from large animals and humans, using them to assess cardiovascular function in mice and other rodents.

Over almost two decades Dr. Reddy's research has included the use of Doppler Flow Velocity measurements (without image guidance) to measure cardiac velocities, blood flow velocities in central and peripheral vessels, coronary flow velocity, stenotic jet velocity, arterial pulse-wave velocity, tail-cuff blood pressure, and arterial wall motion. Imaging methods are used when cardiac and vascular dimensions are required, while invasive methods are used mainly to measure aortic, arterial, and left/right ventricular pressure. Efforts are underway to develop non-invasive indices of aortic impedance and LV systemic load using aortic wall motion and velocity measurements and more recently have found indications that peak aortic blood acceleration correlates well with left ventricular dp/dtmax potentially removing the need for this invasive measurement as well.

Program Details:



The course begins with an emphasis on the building blocks for any successful and repeatable procedure including sedation and anesthetic protocols and monitoring of basic physiological parameters. Techniques for monitoring and controlling physiological parameters such as respiration, core temperature, and heart rate (ECG) will be a central part of all the hands-on protocols.

Course attendees will gain in-depth experience using Doppler probes as a non-invasive means of studying cardiac performance in mouse models. Attendees will learn how to measure and analyze baseline and post-intervention blood flow velocities to determine indices of systolic function (peak aortic flow velocity), LV contractility (aortic acceleration), diastolic function (E/A ratio), LV lusitropy (DT), coronary flow reserve (baseline/hyperemic coronary flow), and aortic stiffness (pulse wave velocity).

Topics to be discussed under Hemodynamic consequences of cardiac and vascular diseases will be:

- How could specific cardiovascular diseases be modeled in this animal or subject group?
- What can we measure to diagnose and study certain cardiovascular diseases?
- How does the cardiovascular system adapt and compensate with disease?
- How these physiological compensations effect the model, measurements and interpretation of results?

Learning Outcomes:

- Basic Principles of Physiological and Ultrasound Measurement:
  physiological - signals, sampling, and noise issues,
  ultrasound - pulsed Doppler concept- range/depth/angle, signals, sampling/processing, aliasing, frequency
- Understanding the differences between blood flow & blood flow velocity
- Cardiovascular Anatomy: cardiac sites & vascular sites
- Cardiac function – hands-on-measurement of blood flow velocity at aortic root, at mitral orifice in mice to determine systolic & diastolic function, respectively.
- Coronary function – hands-on-measurement of blood flow velocity in left main coronary artery in mice to determine coronary flow reserve
- Vascular function – hands-on-measurement of blood flow velocity at aortic arch and abdominal aorta in mice to determine pulse wave velocity to estimate aortic/arterial stiffness.
- Measurement procedures, signal qualification, data analysis, & interpretation

Additional Details

Hosted in vibrant Houston, Texas, course registrants receive preferred rates to local lodging, transportation to and from campus and networking opportunities with course instructors and fellow classmates.
Our promise is to provide an excellent experience both in and out of the lab.

Lodging:

Discounted rates have been negotiated for course attendees at the the Best Western SureStay Plus® Hotel**.** We ask that all attendees stay at this hotel during the course to simplify transportation. However, attendees are welcome to stay at an alternate location should they wish to also arrange their own transportation to and from the lab. The Best Western SureStay Plus® Hotel offers the following comforts and amenities:

- Free high-speed wireless internet
- Free parking
- Indoor heated pool and hot tub
- Fitness Center
- 24-hour front desk
- 24-hour Business Center

Transportation:

Free shuttle service is provided from the Best Western SureStay Plus® Hotel to the lab, and back to the hotel, each day of the workshop.

For those arriving at either George Bush Intercontinental Airport (IAH) or William P. Hobby Airport (HOU), shuttle service to and from the Best Western SureStay Plus® Hotel can be arranged when making your hotel reservation.

NOTE: shuttle or taxi service fees are the responsibility of the course attendee; however, InsideScientific is happy to assist with making arrangements.

Meals:

A complimentary full hot breakfast is provided at the Best Western SureStay Plus® Hotel each morning. In addition, attendees will be provided a boxed lunch each day. Coffee, tea and water will be available during breaks. Please notify InsideScientific and the course instructors of any important dietary restrictions or allergies before attending the workshop.

Course Agenda

Upon registration, registrants receive an on-boarding package including various support material, and direction to view select webinars on InsideScientific.com. This allows registrants to study prior to visiting the lab.

Educational Webinars on InsideScientific:

- Advancements in Rodent Surgical Monitoring by Indus Instruments
- Improving Rodent Cardiovascular Research Outcomes with Integrated Surgical Monitoring
- Utilizing Noninvasive Blood Flow Velocity Measurements for Cardiovascular Phenotyping in Small Animals
- A Noninvasive Alternative to +dP/dtmax: Peak Aortic Blood Acceleration
- Doppler Flow Velocity Measurements for Cardiovascular Research

Laboratory Component:

Day 1:

7:30 – Shuttle from Hotel to Campus

8:00 – Coffee & Introduction

8:30 – **Lecture and Training Session*:**

Lecture: Introducing the use of DFV to measure aortic flow to access the systolic cardiac function

Training Session: Introducing DFVS system and measurement of aortic flow

12:00 – Lunch

1:00 – **Lecture and Training Session*:**

Lecture: Introducing use of DFV to measure mitral flow to assess diastolic cardiac function AND coronary flow

Training Session: Practicing measurement of mitral flow and coronary flow

5:00 – Session Review

5:45 – Shuttle back to Hotel

Day 2:

7:30 – Shuttle from Hotel to Campus

8:00 – Coffee & Introduction

8:30 – **Lecture and Training Session*:**

Lecture: Using DFV to assess function in TAC banded mice

Training Session: Measuring from TAC banded mice

12:00 – Lunch

1:00 – **Lecture and Training Session*:**

Lecture: Pulse wave velocity measurements

Training Session: Pulse wave velocity in mice

Additional practice as required

5:00 – Session Review

5:45 – Shuttle back to Hotel

* Day 1 and 2 Demonstration and Training Sessions are flexible. Attendees can choose to focus on the techniques and surgeries of most interest to them. The needs and goals for each registrant are reviewed prior to visiting the lab.

Registration Information

Course Fee:

Industry Rate: $3,295 USD, Academic Rate: $2,795 USD

For convenience, InsideScientific provides an online application form for scientists interested in registering. Access the form at the following URL:

bit.ly/2Hs9oGl

Following completion of the online form an event coordinator will contact you to discuss payment options. Alternatively, you can complete the Workshop Registration Form on the following page and email to InsideScientific at the following address: events@insidescientific.com.

Please use subject line "Doppler Flow Velocity Workshop". Commitment to the program is not finalized until payment is processed.

Payment & Cancellation Information:

For the security of our registrants, InsideScientific does not collect payment information within online forms.

Course registration is not confirmed until you have received official communication from InsideScientic including a registration invoice.

Please do not make travel plans until you have received an enrollment confirmation. Deadline for registration is 14 days prior to the event.

Workshop seating is typically limited to 6 participants, although classes as large as 8 may be organized. InsideScientific reserves the right to cancel and/or reschedule/combine workshop programs for a later date.

Registrant cancellations must be received no later than 14 days prior to the event to receive a 50% refund of the registration fee. No refunds will be issued if cancellation is received less than 14 days prior to the event.

Advanced payment in full is required to reserve your space. Courses will be filled on a first-come-first-served basis in the order that payment is received.

Workshop Registration Form (email)

To complete registration, please complete the form below and send your application with complete payment details to events@insidescientific.com

Registrant Information

First Name:	Last Name:	Title/Position:
Institution:	Department or Division:	
Institution Address:		
City:	State or Province:	Country:
Telephone (including Country code):	Email:	

Please indicate the course (date) you wish to attend:

Course Fee (USD): Please circle the appropriate rate

$3,295 industry

$2,795 academic

How did you hear about this Program?

- ☐ Email from InsideScientific
- ☐ InsideScientific Website
- ☐ Indus Instruments
- ☐ Scintica Instrumentation Inc.
- ☐ LinkedIn
- ☐ Referral from a Friend/Colleague

Payment Information

** The card security code is a unique three or four-digit number printed on the back of the credit card. It is usually found at the top or right side of the signature strip.*

☐ Visa ☐ MasterCard ☐ AMEX

Card Number:	Expiry Date:
Name on Card:	Security Code*: