SOCIETY OF NUCLEAR MEDICINE AND MOLECULAR IMAGING

CARDIOVASCULAR COUNCIL

NEWSLETTER

Spring 2017

In This Issue:

2016 Herman Blumgart Award

The Cardiovascular Council (CVC) of the Society of Nuclear Medicine and Molecular Imaging would like to congratulate **Prem Soman, MD, PhD** as the 2016 recipient of the Hermann Blumgart Award.

Dr. Prem Soman is Tenured Associate Professor of Medicine(Cardiology), and Clinical and Translational Science at the University of Pittsburgh. He is Director of Nuclear Cardiology and Director of the Advanced Cardiac Imaging Fellowship at the University of Pittsburgh Medical
Center.

Pictured right to left:

Thomas Schindler, MD, CVC Immediate Past President, Prem Soman, MD, PhD, 2016 Hermann Blumgart Winner, Robert J. Gropler, MD, CVC President

2016 SNMMI Young Investigator Awards

The Cardiovascular Council would like to congratulate the winners of the Young Investigator Award competition at the SNMMI Annual Meeting in San Diego. Their outstanding effort and contributions to the field present a bright future for Cardiovascular Nuclear imaging.

Basic Science:

1st Place - Christopher England - "Radiolabeled long circulating nanoparticles for re-assessing the enhanced permeability and retention effect in peripheral arterial disease."

2nd Place - Yoann Petibon - "Impact of MR-based PET motion correction on the quantification of PET kinetic parameters in simultaneous cardiac PET-MR."

3rd Place - Carols Perez-Mendia- "Multimodal PET imaging of high-density lipoprotein's trafficking in multiple atherosclerosis models."

Clinical Science:

1st Place - Thorston Derlin - "Imaging ruptured coronary atherosclerotic plaques by use of CXCR4-targeted, motion corrected PET/CT."

2nd Place - Ines Valenta - "PET-Measured Longitudinal Flow Gradient Correlates with Invasive Fractional Flow Reserve in CAD."

3rd Place - Xiang Li - "Combined 18F-FDG PET/CT and 18F-NaF PET/CT imaging in assessing vascular inflammation and osteogenesis in calcified atherosclerotic lesions."

International Update

Beginning in 2016, the CV Council approved 2 Board of Director positions to be filled by colleagues from outside the United States. The Council is pleased to welcome our International members for 2016:

Diana Paez, MD, M.Ed
Section Head, Nuclear Medicine and Diagnostic Imaging Section
International Atomic Energy Agency
Vienna, Austria

Wanda Acampa, MD, PhD
Associate Professor, Diagnostic Imaging and Radiotherapy
Department of Advanced Biomedical Sciences, Università "Federico II"
Naples, Italy

The Council welcomes our new members and looks forward to their input toward collaboration and global opportunities for Nuclear Cardiology created by this alliance.

Intern Update: James Thackeray, PhD

2016 was a very productive year for our group. We were pleased to have been cited in the Cardiovascular Highlights lecture by Dr. Nagara Tamaki (a former Blumgart Award recipient) for the following work presented at the Annual meeting for the following work:

1. Dynamic myocardial SPECT imaging: We evaluated the suitability of 99mTc-teboroxime (synthesized in-house) for dynamic myocardial perfusion SPECT imaging in mice, both healthy and after myocardial infarction. Using a dedicated small animal SPECT camera equipped with a full ring of CZT detectors, we were able to maximize the counts detection in order to shorten the acquisition time and perform a pseudo-dynamic scan using sequential ~90s acquisitions with the rotating 7 pinhole collimator. 99mTc-Teboroxime SPECT provided clear delineation of the myocardium over the first 2 acquisition timeframes, with a higher extraction and rapid washout over ~15min. By contrast, 99mTc-sestamibi myocardial uptake was lower and more stable over the same timeframe. The perfusion defect calculation was statistically similar. Effectively, we found that the higher counts statistic afforded by CZT allowed us to shorten the acquisition frames sufficiently to observe the dynamic time-course of 99mTc-teboroxime, providing the foundation for further evaluation of quantitative myocardial perfusion with 99mTc-teboroxime.

2. Markers of myocardial infarction: We had previously demonstrated that in the early stages (~3d) after myocardial infarction, 11C-methionine accumulated in the infarct territory, and that this signal declined over 7d, consistent with the regression of activated inflammatory cells. Here, we aimed to characterize the cellular basis of this signal. In vitro, we established selective uptake of 11C-methionine by M1-polarized 'pro-inflammatory' macrophages, and comparable uptake in peripheral blood monocytes, neutrophils, and non-B lymphocytes. We then evaluated the number of CD11b-positive monocytes/macrophages in the left ventricle of mice 3d after myocardial infarction, and demonstrated higher uptake of methionine by these cells in subsequent culture. Finally, we blocked leukocyte trafficking to the infarct territory by antibody-based inhibition of integrins, and established a ~60% reduction of 11C-methionine accumulation in the infarct territory at 3d post-MI. As such, the source of the 11C-methionine

signal could be more strongly assigned to inflammatory leukocytes by this combination of in vitro and in vivo experiments. This work is currently in press with *Theranostics* 2016;6(11):1768-79.

3. Translocator Protein (TSPO)Targeting: With one of our medical students, we looked at the association of myocardial infarction with systemic-, and particularly, neuro-inflammation using the novel mitochondrial translocator protein-targeted radiotracer. We found that binding was elevated early after MI not only in the heart but also in the brain, which was associated with increased microglial immunostaining. The signal returns to baseline in both organs over 4 weeks after MI, but at 8 weeks there is a resurgence of tracer binding in the remote myocardium and in the brain. Taken together, acute MI and chronic heart failure are associated with neuroinflammation identified by TSPO PET imaging, which may have consequences for cognition and the development of dementia.

In addition, the highlights lectures also touched on two of my colleagues' studies -- Dr Derlin, who won the Clinical Young Investigator competition with his study on CXCR4 imaging of ruptured coronary atherosclerotic plaques using 68Ga-pentixafor; and Dr Caobelli, who presented preliminary work on quantitative myocardial perfusion SPECT imaging using 99mTc-sestamibi.

In other Intern Update news, I received notification last week that my grant application to the German Research Foundation (DFG) was successful, which is focused on the relationship between imaging of acute inflammation post-MI and the progression of ventricular remodeling and heart failure.

New in the Literature

A new joint Position Statement on cardiac PET was announced by the American Society of Nuclear Cardiology.

The Position Statement, developed by both ASNC and the SNMMI, upgrades PET to a “preferred” test for patients who meet criteria for stress imaging but are unable to complete a diagnostic-level of exercise.

The Statement also identifies five distinct clinical situations where cardiac PET is recommended:

- poor quality, equivocal, or inconclusive prior stress-imaging study
- patients with certain body characteristics that commonly affect image quality
- higher-risk patients
- younger patients to minimize accumulated life-time radiation exposure
- when myocardial blood flow quantification is identified by clinicians to be a needed adjunct to the image findings

Dr. Timothy Bateman, Professor of Medicine at the University of Missouri in Kansas City, and member of the Cardiovascular Council Board of Directors was the lead author on the statement. He said "The extensive evidence base supporting myocardial perfusion PET for patients requiring pharmacologic stress imaging prompted development of this joint societal Position Statement.”

He added "Importantly, the Position Statement included substantive input from more than 25 experts in SPECT and PET from around the world, before undergoing rigorous review by the two professional organizations most knowledgeable on this subject. This assessment directly supports value-based quality health care".

Dr. Bateman’s Co-Chair on the Statement was former CV Council President Vasken Dilsizian, who said “For diagnosing coronary artery disease, myocardial perfusion PET imaging out performs other tests because of its high diagnostic accuracy, low radiation exposure, short image acquisition time and its ability to accommodate ill or high-

risk patients and those with large body habitus." Vasken is Professor of Radiology and Medicine at the University of Maryland School of Medicine in Baltimore, and is Director-at-Large for the SNMMI's House of Delegates.

Council President Robert Gropler, and Board Members James Case, Panithaya Chareonthaitawee, Rob deKemp, Sharmila Dorbala, Henry Gewirtz, Terrence Ruddy and Thomas Schindler all contributed to the cross-societal effort. The Council congratulates the members of both organizations that made this statement possible.

The guideline will be available on the Resources area of the CV Council Web site and can be accessed **HERE**

Annual Meeting Preview

The Annual Meeting returns to Denver, Colorado for a week of the best that Molecular Imaging science has to offer. You can access the meeting preview document **HERE**

The Cardiovascular Council sponsors and co-sponsors several educational programs throughout the Annual Meeting. Here is a list of all programs related to cardiovascular imaging in Denver:

- *Categorical 2: Advances in CV Multimodality and Molecular Imaging (Separate Registration Fee Required)* Saturday, June 10, 8:00 AM – 4:00 PM
- ***TS03:** Updates in Nuclear Cardiology;* Saturday, June 10, 4:30 – 6:00 PM
- ***CE04**: How to Establish a Cardiac PET Program* – Saturday, June 10, 4:30-6:00 PM
- *CE13: Translation of New Radiotracer Development*; The Need for Speed; Sunday, June 11, 12:30-2:00 PM
- *SS05: Cardiovascular Young Investigator Award Symposium*; Sunday, June 11, 12:30-1:00 PM
- *CE25: Beyond MPI - New Tracers and Applications;* Sunday, June 11, 4:45 – 6:15 PM
- *CE33: Inflammation as a Novel Target for Clinical Cardiovascular Imaging;* Monday June 12, 10:00-11:30 (German Society of Nuclear Medicine)
- *SS21: Molecular Imaging of Atherosclerosis;* Monday, June 12, 10:00 – 11:30 AM
- *CE 29: Read with the Experts in Nuclear Cardiology;* Monday, June 12, 10:00 – 11:30 AM
- *SS29: Advances in Myocardial Blood Flow and Dyssynchrony;* Monday, June 12, 12:30 – 2:00 PM
- *TS18: Cardiac PET;* Monday, June 12, 12:30 – 2:00 PM
- *CE46: Cardiovascular Boot Camp I ;* Monday, June 12, 3:00 – 4:30 PM
- *CE53: Cardiovascular Boot Camp II ;* Monday, June 12, 4:45 – 6:15 PM
- *SS37: Breakthroughs in Imaging the Biology of Atherosclerosis;* Monday, June 12, 4:45 – 6:15 PM
- *CE60: Dynamic SPECT with Kinetic Analysis;* Tuesday, June 13, 8:00 – 9:30 AM
- *SS45: Clinical Nuclear Cardiology; Ischemia and Heart Failure;* Tuesday, June 13, 8:00 – 9:30 AM
- *CE67: Role of Nuclear Cardiology in Centers of Excellence;* Tuesday, June 13, 10:00 – 11:30 AM
- *SS53: Nuclear Cardiology, New Tracers and Methods;* Tuesday, June 13, 10:00 – 11:30 AM
- *MTA II: Cardiovascular Basic Science Posters;* Tuesday, June 13, 2:45 – 4:15 PM
- *MTA II: Cardiovascular Clinical Science Posters;* Tuesday, June 13, 2:45 – 4:15 PM
- *SS69: Novel Imaging Techniques for Myocardial Phenotyping;* Tuesday, June 13, 3:00 – 4:30
- *CE81: Quantifying Myocardial Blood Flow with PET;* Tuesday, June 13, 3:00 – 4:30
- *CE91: Alternative Payment Models and Value-Based Health Care: Nuts and Bolts;* Tuesday, June 13, 4:45 – 6:15 PM
- *CE 99 Strategies for Reducing Radiation Exposure;* Wednesday, June 14, 9:45–11:15 AM

Save the Dates - CVC Awards:

Hermann Blumgart Award Lecture – Sunday, June 11, 3:00–4:30 PM, 710/712

Young Investigator's Awards (YIA) Ceremony and YPC Awards - Monday, June 12, 2:00–3:00 PM, Exhibit Hall C

Please visit the Cardiovascular Council website for more information and to join or renew your membership! Your membership is critical to the ability of the CVC to continue providing the highest caliber educational programs!