Dear Colleagues,

Welcome to the inaugural PET Radiotracer Translation and Resource Center (PET-RTRC) newsletter. We hope you are staying safe during these trying times. The mission of the PET-RTRC is to develop and disseminate a broad portfolio of radiotracers used in preclinical and human imaging studies throughout the nation. This is largely accomplished through Technology Research and Development (TR&D) Projects based at the Mallinckrodt Institute of Radiology (MIR) at Washington University in St. Louis (WUSTL) interacting with Collaborative and Service Projects (CPs and SPs) based at various institutions throughout the country. In addition, the Center is committed to training scientists in the design and translation of PET radiotracers through seminars, didactic learning, providing standard operating procedures (SOPs), and hands-on training.

Since the launch of the Center, we have successfully translated two radiotracers to first-in-human studies and supplied unique synthetic materials and SOPs to CPs and SPs. A number of successful seminars and webinars have been held both through MIR/WUSTL and through outside societal/industrial support.

Despite challenges during these unusual times, we look forward to the coming year. We are moving forward with the exciting science in our TR&Ds such as the development of a radiotracer that detects reactive oxygen species as discussed in greater detail in the Spotlight section below (click here for news release). We are planning our 2022 Workshop and Scientific Session, to be held January 11-13. The in-person and virtual Workshop will focus on preclinical and clinical imaging. We certainly hope you will be able to attend.

It is an exciting time to be a part of the Center! Please visit our website @ http://mir.wustl.edu/pet-rtrc to get more details on the PET-RTRC and upcoming activities. To stay up to date with our most recent developments or to be added to our mailing list, please contact Michelle Hoelscher at michellehoelscher@wustl.edu

Best Regards,
Robert J Gropler, MD, PET-RTRC Program Director
Spotlight

The NIBIB funded P41 PET-RTRC program at WUSTL and MIR aims to develop new PET radiotracers capable of allowing precision imaging for improving the diagnosis and treatment of human disease. These radiotracers will offer versatile noninvasive tools for understanding pathophysiology at a molecular level across a wide spectrum of disease states. During the current funding cycle, the PET-RTRC programmatic mission is focused upon developing PET radiotracers for imaging inflammation.

Among different Translational Research and Development (TR&D) projects, TR&D 3 (Led by Dr. Vijay Sharma (right), Professor of Radiology and Co-leader Dr. Kooresh Shoghi, Professor of Radiology) is focused upon design and development of PET radiotracers to detect the presence of reactive oxygen species (ROS) and understand their vital role in mediating inflammation. Of note, ROS are known to regulate critical physiological functions, including cellular homeostasis, vascular diameter, oxygen sensing, host pathogen defense, skeleton muscle physiology, gene transcription, and signal transduction. However, the imbalance in production/mitigation of ROS has been implicated in the pathogenesis of numerous diseases, such as cardiovascular disease, diabetes, atherosclerosis, asthma, Alzheimer's disease, psoriasis, rheumatoid arthritis, aging, and acute lung injury.

The interdisciplinary investigator team led by Dr. Sharma has developed Galuminox, a radiotracer that detects superoxide and its downstream byproduct, hydrogen peroxide and shows promise in imaging inflammation in the lungs of mice. For modeling acute respiratory distress syndrome, a leading cause of sudden death in intensive care units worldwide, investigators injected mice with lipopolysaccharide, a molecule that stimulates ROS production, and is a component of many types of bacteria known to cause this disease. Administration of the Galuminox to mice that received lipopolysaccharide revealed high uptake of the agent in the lungs, observed via PET, consistent with measurements of poor pulmonary function known to associate with this condition. The study results were published in the October 2020 issue of Redox Biology. Currently, investigators are evaluating the utility of this new PET radiotracer in models of chronic inflammation. Since the technology is compatible with kit formulations for onsite production, it is anticipated that bench to bedside translation of this radiotracer may push frontiers of PET imaging to locations uncovered by current distribution models of radiotracers.

### Collaborative Projects

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<tr>
<th>State</th>
<th>Institution</th>
<th>Project/Condition</th>
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<tbody>
<tr>
<td>ILLINOIS</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Breast Cancer</td>
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<tr>
<td>IOWA</td>
<td>The University of Iowa</td>
<td>Cystic Fibrosis</td>
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<td>MASSACHUSETTS</td>
<td>Massachusetts General Hospital</td>
<td>Liver Fibrosis</td>
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<td>MISSOURI</td>
<td>Washington University School of Medicine</td>
<td>Abdominal Aortic Aneurysm</td>
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<td>Left Ventricular Remodeling</td>
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<td>Parkinson's Disease</td>
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<td>Non-Small Cell Lung Cancer</td>
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<td>OREGON</td>
<td>Oregon Health &amp; Science University</td>
<td>Atherosclerosis</td>
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<tr>
<td>GERMANY</td>
<td>Hannover Medical School</td>
<td>Left Ventricular Hypertrophy</td>
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### Service Projects

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<td>University of California San Francisco</td>
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<td>CONNECTICUT</td>
<td>Yale University</td>
<td>Inflammation and Cancer</td>
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<td>MASSACHUSETTS</td>
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<td>MISSOURI</td>
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<td>Human Left Ventricular Remodeling</td>
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<td>NORTH CAROLINA</td>
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<td>PENNSYLVANIA</td>
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<td>Liver Cancer</td>
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<tr>
<td>NETHERLANDS</td>
<td>Eindhoven University</td>
<td>Atherosclerosis</td>
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**Interested in becoming a member of the Center?**

Please fill out the [Collaborative Project](#) or [Service Project](#) application and send to [michellehoelscher@wustl.edu](mailto:michellehoelscher@wustl.edu)
Workshops

In 2020, the PET-RTRC hosted a 2-day Regulatory and Clinical Imaging Workshop with presentations from experts in the field of PET-based Molecular Imaging.

Keynote Speaker- Martin G. Pomper, MD Henry N. Wagner Jr., MD Professor of Nuclear Medicine Johns Hopkins Medicine “Precision Imaging”
Facility Tours

All workshop participants were given the opportunity to go on small group tours the state of the art imaging, research, production and clinically utilized facilities housed within the Mallinckrodt Institute of Radiology. This unique opportunity was exceptionally well attended.

Poster Session

Following the lectures, early career investigators and leadership of the PET-RTRC showcased and discussed their projects through an informative poster session representing a vast array of research taking place within the PET-RTRC.
In 2021, the PET-RTRC hosted a Virtual 2-day Radiometal Labeling and Chemistry of Standard Radionuclides Workshop with presentations from experts in these fields.
2021 Virtual Advisory Board Meeting

Members of the External Advisory Board, Tracer Review Committee and NIBIB Program joined in a full day meeting to review progress of the PET-RTRC.

Project leaders presented their exciting accomplishments from the previous year and fielded questions from the entirety of the PET-RTRC advisory collective. Although a virtual event, the day went extremely well with stimulating discussions throughout the entire meeting.
## Publications

**TR&D 1:**


**TR&D 2:**


**TR&D 3:**


Upcoming Events

SAVE THE DATE | January 11-13, 2022

PET-RTRC Annual Workshop | Scientific Session
Clinical & Pre-clinical Imaging

NEXT SEMINAR SPEAKER | August 31, 2021

Dr. Uwe Haberkorn- Heidelberg University
“Design of Tumor Targeting Tracers”

More information to come on our [website](#).

Next Webinars focused on the practical aspects of alpha emitting isotope utilization, probe development aspects and clinical presentations. More information to come on our [website](#).

Look for Us

PET-RTRC BOOTH @ WMIC October 6-9, 2021 | Miami Beach, Florida
Leadership

Executive Committee Members
Robert Gropler, MD | Chair, Program Director, TR&D 2 Co-Leader
Will Tu, PhD | TR&D 1 Leader, Training & Dissemination Co-Leader-Training
Yongjian Liu, PhD | TR&D 2 Leader
Vijay Sharma, PhD | TR&D 3 Leader
Kooresh Shoghi, PhD | TR&D 3 Co-Leader, QI2R Co-Leader
Dan Marcus, PhD | QI2R Co-Leader
Sally Schwarz, RPh, MS, BCNP | Training & Dissemination Co-Investigator
Buck Rogers, PhD | Training & Dissemination Project Leader
Dave Reichert, PhD | TR&D 1, 2, 3 Co-Investigator
Richard Laforest, PhD | QI2R Co-Investigator
Farrokh Dehdashti, MD | TR&D 2 Co-Investigator
Michael Nickels, PhD | Training & Dissemination Co-Leader-Dissemination
Michelle Hoelscher, CNMT | Project Administrator

External Advisory Board
Henry VanBroocklin PhD, University of California San Francisco (Chair)
Richard Carson PhD, Yale University
Christopher Kevil PhD, Louisiana State University Health Sciences Center Shreveport
Craig Malloy MD, University of Texas Southwestern
David Mankoff MD, PhD, University of Pennsylvania

Tracer Review Committee
Mark Goodman PhD, Emory University (Chair)
John Katzenellenbogen PhD University of Illinois at Urbana-Champaign
Buck Rogers PhD, Washington University
Richard L. Wahl MD, Washington University

How to find us...
mir.wustl.edu/pet-rtrc
#PETRTRC

For more information about the PET-RTRC contact:
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314.747.4076
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