Program Schedule

Thursday, October 18th, 2018

7:00 – 8:00 am	**Continental Breakfast**
8:00 – 8:10 am	**Introductory Remarks** Rahim R. Rizi, Ph.D. University of Pennsylvania
8:10 – 8:15 am	**Welcome Remarks** Mitchell D. Schnall, M.D., Ph.D. University of Pennsylvania
	Session I: Keynote Lectures **Moderator: Rahim R. Rizi, Ph.D.**
8:15 – 8:40 am	**Cancer Imaging and Metabolic Therapy** Chi Dang, M.D., Ph.D. Ludwig Institute for Cancer Research
8:40 – 9:05 am	**Metabolic Oncologic Imaging: Why It Matters** Peter Choyke, M.D. National Institutes of Health
9:05 – 9:25 am	**Probing Metabolic Networks in Human Subjects** Craig Malloy, M.D. University of Texas, Southwestern
9:25 – 9:45 am	**Development and Translation of Hyperpolarized Carbon-13 MRI for Human Cancer and Brain Research** Daniel Vigneron, Ph.D. University of California, San Francisco
9:45 – 10:00 am	**Discussion**
10:00 – 10:15 am	**Break**
	Session II: Moving Hyperpolarized Carbon-13 into the Clinic – Opportunities & Challenges **Moderator: John Kurhanewicz, Ph.D.**
10:15 – 10:35 am	**What Hyperpolarized ^{13}C MR Has to Achieve to be Used Routinely in Neurological and Psychiatric Research and Clinical Practice** Douglas Rothman, Ph.D. Yale University
10:35 – 10:55 am	**Phospholipid Metabolism in Mutant IDH1 Glioma – MRS Studies** Sabrina Ronen, Ph.D. University of California, San Francisco
10:55 – 11:15 am	**Feeding the Failing Heart** Daniel Kelly, M.D. University of Pennsylvania
11:15 – 11:35 am	**Toward Using In-cell HP MRS to Study Metabolism** Kayvan Keshari, Ph.D. Memorial Sloan Kettering Cancer Center
11:35 – 11:55 am	**Physiologic and Metabolic Imaging of Pancreatic Tumor Xenografts in Mice – Imaging Biomarkers to Guide Treatment** Murali K. Cherukuri, Ph.D. National Institutes of Health
11:55 am – 12:10 pm	**Discussion**
12:10 – 1:00 pm	**Lunch**

Session III: Graduate Student and Postdoctoral Presentations – Part I **Moderators: Jeremy Gordon, Ph.D.**	
1:00 – 1:10 pm	**The Use of Hyperpolarized Imaging for Assessing Lung Transplantation Outcomes in Rats** Sarmad Siddiqui University of Pennsylvania
1:10 – 1:20 pm	**Hyperpolarized Micro-NMR for Sensitive and High-Throughput Analysis of Metabolic Flux in Rare Cells** Sangmoo Jeong, Ph.D. Memorial Sloan Kettering Cancer Center
1:20 – 1:30 pm	**Mitochondrial Uncoupling Alters Pancreatic Cancer Metabolism** Lotte B. Berterlsen, Ph.D. Aarhus University, Denmark
1:30 – 1:40 pm	**CRISPR-Cas9 Genome Editing to Guide Selection of DNP-^{13}C-MRI Probes Sensitive to Metabolic Heterogeneities in Cancer** Nicholas R. Perkons University of Pennsylvania
1:40 – 1:50 pm	**Dynamic Metabolic Imaging of Co-Polarized [2-^{13}C]Pyruvate and [1,4-$^{13}C_2$]Fumarate Using 3D-Spiral CSI with Alternate Spectral Band Excitation** Maninder Singh, Ph.D. University of Maryland
1:50 – 2:00 pm	**Hyperpolarized ^{129}Xe Imaging in Lung Cancer** Luis A. Loza University of Pennsylvania
2:00 – 2:10 pm	**Break**
Session IV: IND and Regulatory Guidelines **Moderators: Jan Henrik Ardenkjaer-Larsen, Ph.D.**	
2:10 – 2:30 pm	**The NCI IND of C-13 Pyruvate: A Resource for the Community** Paula M. Jacobs, Ph.D. National Institutes of Health
2:30 – 2:50 pm	**Unmet Needs, Strategies and Opportunities in Cancer Imaging** Huiming Zhang, Ph.D. National Institutes of Health
2:50 – 3:10 pm	**Production of Filled Pharmacy Kits and Terminal Sterilization for Human Studies** James Slater, Ph.D. University of California, San Francisco
3:10 – 3:25 pm	**Review of the Status and Challenges of Hyperpolarized Imaging** Jonathan Murray GE Healthcare
3:25 – 3:40 pm	**Review of Current Status of Hyperpolarized Agents for Research and Clinical Trials** C.T. Tan, Ph.D. Millipore Sigma
3:40 – 3:55 pm	**Shunt, Don't Block: A New Approach to Dual Nuclear Coil Design** Matthew G. Erickson, M.D., Ph.D. University of Florida
3:55 – 4:00 pm	**Discussion**
4:00 – 4:15 pm	**Break**

	Session V: Technical Advances – Polarization and Probes I **Moderator: Simon Duckett, Ph.D.**
4:15 – 4:35 pm	**Recent Advances in Dissolution-DNP Polarization** Jan Henrik Ardenkjaer-Larsen, Ph.D. Technical University of Denmark
4:35 – 4:55 pm	**Parahydrogen Derived Polarization for Metabolic Imaging** Eduard Chekmenev, Ph.D. Vanderbilt University
4:55 – 5:15 pm	**Development of a Preclinical PHIP Polarizer** Shawn Wagner, Ph.D. Cedars-Sinai Medical Center
5:15 – 5:35 pm	**Hyperpolarized ^{13}C MR Using Photo-induced Nonpersistent Radicals** Arnaud Comment, Ph.D. GE Healthcare
5:35 – 5:55 pm	**New Approaches in SABRE: Cleavable Metabolic / pH-Sensing "Double Agents", and Preparation of Purified Agents via Heterogeneous Catalysis and Catalyst Immobilization** Boyd Goodson, Ph.D. Southern Illinois University
5:55 – 6:15 pm	**Para-hydrogen Induced Hyperpolarization for Quantitative NMR Analysis at Sub-Micromolar Concentrations** Marco Tessari, Ph.D. Radboud University, Netherland
6:15 – 6:35 pm	**New Developments on Obtaining Molecular Structure and Dynamics from Transient Hyperpolarization** Christian Hilty, Ph.D. Texas A&M University
6:35 – 6:55 pm	**Hyperpolarization Chemistry and Spin Physics for Next Generation Biosensing** Thomas Theis, Ph.D. Duke University
6:55 – 7:10 pm	**Discussion**

Friday, October 19th, 2018

7:00 – 8:00 am	**Continental Breakfast**
	Session VI: Keynote Lectures II **Moderator: Chi Dang, M.D., Ph.D.**
7:50 – 8:15 am	**Clinical Development Strategy for Hyperpolarized MR Imaging Techniques** Mitchell D. Schnall, M.D., Ph.D. University of Pennsylvania
8:15 – 8:40 am	**Role of Metabolism in Supporting Cancer Proliferation** Matthew G. Vander Heiden, Ph.D. Massachusetts Institute of Technology
8:40 – 9:05 am	**Current Status of Hyperpolarized ^{13}C MR of Prostate Cancer Patients** John Kurhanewicz, Ph.D. University of California, San Francisco
9:05 – 9:15 am	**Discussion**
9:15 – 9:30 am	**Break**

	Session VII: Technical Advances – Polarization and Probes II **Moderators: Rahim R. Rizi, Ph.D. and Warren S. Warren, Ph.D.**
9:30 – 9:50 am	**Scaling Up SABRE Variants to Clinically Useful Levels with Biologically Interesting, Long-Lived Agents** Warren S. Warren, Ph.D. Duke University
9:50 – 10:10 am	**Using SABRE to Hyperpolarize Pyruvate, Urea and Nicotinamide: Progress Towards *In vivo* Assessment** Simon Duckett, Ph.D. University of York, United Kingdom
10:10 – 10:30 am	***In Vivo* and in Cells Metabolic Studies Using PHIP-SAH Hyperpolaried [1-^{13}C] Pyruvate** Silvio Aime, Ph.D. University of Torino, Italy
10:30 – 10:40 am	**Discussion**
10:40 – 10:50 am	**Break**
	Session VIII: Maximizing the Information Harvest **Moderator: Matthew Merritt, Ph.D.**
10:50 – 11:10 am	**A Dual Metabolomics/Hyperpolarization Approach Identifies Profound TCA Cycle Disruption as a Consequence of B-Lapachone Treatment of Pancreatic Cancer Cells** Matthew Merritt, Ph.D. University of Florida
11:10 – 11:25 am	**Development of Hyperpolarized ^{13}C Metabolic Biomarkers of Prostate Cancer Aggressiveness – from Cells to Patient Derived Tissues** Renuka Sriram, Ph.D. University of California, San Francisco
11:25 – 11:40 am	**Methods for Examining Perfused Cancer Cells with Hyperpolarized Substrates Under Hypoxic Conditions** Anthony Mancuso, Ph.D. University of Pennsylvania
11:40 – 11:55 am	**Excitation and Encoding in Hyperpolarized ^{13}C MRI** Charles Cunningham, Ph.D. Sunnybrook Research Institute, Canada
11:55 am – 12:05 pm	**Discussion**
12:05 – 1:00 pm	**Lunch**
	Session IX: Graduate Student and Postdoctoral Presentations – Part II **Moderator: Cornelius von Morze, Ph.D.**
1:00 – 1:10 pm	**Metal-Free Hyperpolarized Metabolites Produced via Rapid Catalyst Capture** Danila Barskiy, Ph.D. University of California, Berkeley
1:10 – 1:20 pm	**Quantum Monte Carlo Simulations to Explore the Limits of SABRE** Jacob R. Lindale, Ph.D. Duke University
1:20 – 1:30 pm	**Hyperpolarized ^{13}C Imaging of Treatment Responses on Prostate Cancer Patients Using 3D Dynamic CS-EPSI Techniques** Hsin-Yu Chen, Ph.D. University of California, San Francisco

1:30 – 1:40 pm	**Hyperpolarized MRI Visualizes Warburg Effects and Predicts mTOR Inhibitor Treatment Response in Patient-Derived ccRCC Xenograft Models** Roozbeh Eskandari, Ph.D. Memorial Sloan Kettering Cancer Center
1:40 – 1:50 pm	**Parametric Measurement of Acute Myocardial Infarction in a Large Preclinical Model – Metabolism and Perfusion Quantified** Esben S. Hansen, Ph.D. Aarhus University, Denmark
1:50 – 2:00 pm	**Monitoring Lung Cancer in Rodents Using Hyperpolarized Carbon-13** Tahmina Achekzai University of Pennsylvania
2:00 – 2:10 pm	**Break**
	Session X: Cancer Detection and Monitoring with PET **Moderator: David Mankoff, M.D., Ph.D.**
2:10 – 2:30 pm	**NCI's Vision/Initiatives Funding Opportunities in Cancer Biology** Nancy Boudreau, Ph.D. National Institutes of Health
2:30 – 2:50 pm	**Translating PET Cancer Metabolism Imaging to Patients: Beyond FDG** David Mankoff, M.D., Ph.D. University of Pennsylvania
2:50 – 3:10 pm	**PET Tracers to Guide Metabolically-targeted Therapy** Charles Manning, Ph.D. Vanderbilt University
3:10 – 3:30 pm	**Fluoroglutamine PET/CT: First in-Human Trial** Mark Dunphy, M.D. Memorial Sloan Kettering Cancer Center
3:30 – 3:50 pm	**Imaging Cancer Glutamine Metabolism by PET and MRI** Rong Zhou, Ph.D. University of Pennsylvania
3:50 – 4:00 pm	**Discussion**
4:00 – 4:15 pm	**Break**
	Session XI: Metabolism and Pathways – Part I **Moderator: Douglas Rothman, Ph.D.**
4:15 – 4:35 pm	**Multi-scale Platform for Combined Magnetic Resonance Spectroscopy and Optical Imaging of Metabolism in 3D Cell Cultures** Sean B. Fain, Ph.D. University of Wisconsin, Madison
4:35 – 4:55 pm	**Hyperpolarized ^{13}C MRI and Biomarkers of Androgen Signaling in Castrate-resistant Prostate Cancer** Mark Titus, Ph.D. University of Texas, MD Anderson Cancer Center
4:55 – 5:15 pm	**Deuterium Metabolic Imaging (DMI) – A Novel MR-based Method to Map Metabolism in 3D** Robin de Graaf, Ph.D. Yale University
5:15 – 5:35 pm	**Effects of B1 and Slice Profile Inhomogeneities on Dynamic HP ^{13}C MRI** James Bankson, Ph.D. University of Texas, MD Anderson Cancer Center

5:35 – 5:55 pm	**Cardiac Carbon: Coils, Code and Challenges** Jack Miller, Ph.D. University of Oxford, United Kingdom
5:55 – 6:15 pm	**Quantitative Imaging of Brain Energy Metabolisms and Neuroenergetics at Ultrahigh Field** Wei Chen, Ph.D. University of Minnesota
6:15 – 6:35 pm	**Metabolic Modeling of ^{13}C Hyperpolarized Data for Studying Brain Metabolism and Neurotransmission** Graeme Mason, Ph.D. Yale University
6:35 – 6:50 pm	**Discussion**

Saturday, October 20th, 2018

7:00 – 8:00 am	**Continental Breakfast**
	Session XII: Advances in Acquisition Strategies **Moderator: Kayvan Keshari, Ph.D.**
8:00 – 8:20 am	**Hyperpolarized Functional and Metabolic Kidney Imaging** Christoffer Laustsen, Ph.D. Aarhus University, Denmark
8:20 – 8:40 am	**Optimum Acquisitions for Hyperpolarised Metabolic Imaging** Rolf Schulte, Ph.D. GE Healthcare
8:40 – 9:00 am	**Imaging of Treatment Refractory, Latent Cellular Domains in Hepatocellular Carcinoma** Terence Gade, M.D., Ph.D. University of Pennsylvania
9:00 – 9:20 am	***In Vivo* Hyperpolarization Transfer in a Clinical MRI Scanner** Cornelius von Morze, Ph.D. University of California, San Francisco
9:20 – 9:40 am	**Probing Lung Inflammatory Injury Using Hyperpolarized ^{13}C MRI** Mehrdad Pourfathi, M.S. University of Pennsylvania
9:40 – 9:55 am	**Discussion**
9:55 – 10:10 am	**Break**
	Session XIII: Metabolism and Pathways – Part II **Moderator: Christoffer Laustsen, Ph.D.**
10:10 – 10:30 am	**Imaging Superoxide Levels in Tissues with PET** Robert Mach, Ph.D. University of Pennsylvania
10:30 – 10:50 am	**Applications of Deuterium Magnetic Resonance Imaging to Gliomas** Henk de Feyter, Ph.D. Yale University
10:50 – 11:10 am	**Applications of Hyperpolarized ^{13}C MRI in Traumatic Brain Injury** Dirk Mayer, Ph.D. University of Maryland

11:10 – 11:30 am	**Extending Volumetric Coverage Using 3D Hyperpolarized C-13 EPI with Calibrationless Parallel Imaging** Jeremy Gordon, Ph.D. University of California, San Francisco
11:30 – 11:50 am	**^{13}C Hyperpolarization in Nanodiamonds: Applications to Spectroscopy and Imaging** Ashok Ajoy, Ph.D. University of California, Berkeley
11:50 am – 12:10 pm	**Noninvasive Evaluation of Metabolic Flexibility in Heart and Contracting Skeletal Muscle** Timothy R. DeGrado, Ph.D. Mayo Clinic
12:10 – 12:20 pm	**Discussion**
12:20 – 1:10 pm	**Lunch**
Session XIV: Graduate Student and Postdoctoral Presentations – Part III Moderators: Mehrdad Pourfathi and Sarmad Siddiqui	
1:10 – 1:20 pm	**Multimodal Molecular *In Vivo* Imaging Reveals Tumor Microenvironments from Integrating Hyperpolarized ^{13}C MRI, ^{18}F-FDG PET, and EPR Imaging in Pancreatic Ductal Adenocarcinoma** Kazu Yamamoto, Ph.D. National Institutes of Health
1:20 – 1:30 pm	**Quantifying Glutamine Metabolism in Pancreatic Cancer** Ilana Kotliar Memorial Sloan Kettering Cancer Center
1:30 – 1:40 pm	**Iterative Joint Spatial-Spectral Reconstruction for Hyperpolarized ^{13}C Imaging with Prior Knowledge** Minjie Zhu University of Maryland
1:40 – 1:50 pm	**Increasing ^{13}C Relaxation Times with D_2O Solvation** Andrew Cho Memorial Sloan Kettering Cancer Center
1:50 – 2:00 pm	**Terminal Diazirines Enable Reverse Polarization Transfer from ^{15}N Singlets** Guannan Zhang, Ph.D. Duke University
2:00 – 2:10 pm	**Design of Molecular Probes with Long T_1 for Hyperpolarized MRI** Yohei Kondo University of Tokyo, Japan
2:10 – 2:20 pm	**Break**
Session XV: Metabolism and Pathways – Part III Moderator: Jerry Glickson, Ph.D.	
2:20 – 2:40 pm	**Taking Advantage of Orthogonal Metabolic Pathways for Targeted Infection Imaging** Mark Sellmyer, M.D., Ph.D. University of Pennsylvania
2:40 – 3:00 pm	**Metabolic Imaging of Targeted Therapy in Preclinical Cancer Models** Sui Seng Tee, Ph.D. Memorial Sloan Kettering Cancer Center
3:00 – 3:20 pm	**Stable Isotope Tracing and Quantification of Compartmentalized Metabolism** Nathaniel Snyder, Ph.D. Drexel University

3:20 – 3:40 pm	**^{13}C Tracer Studies Using MIMOSA – A New Window on Quantitative Fluxomic** Richard Kibbey, M.D., Ph.D. Yale University
3:40 – 4:00 pm	**Metabolic Network Analysis in Cancer: Quantification of Flux** Alexander Shestov, Ph.D. University of Pennsylvania
4:00 – 4:10 pm	**Final Remarks** Stephen Kadlecek, Ph.D. University of Pennsylvania