

## Thursday, February 28<sup>th</sup>, 2019

7:00 – 7:50 am	<b>Continental Breakfast and Registration</b>
7:50 – 8:00 am	<b>Introductory Remarks</b> Rahim R. Rizi, Ph.D. University of Pennsylvania
8:00 – 8:10 am	<b>Welcome Remarks</b> Mitchell D. Schnall, M.D., Ph.D. University of Pennsylvania
<b>Session I: Keynote Lectures – Part I</b> Moderator: Rahim R. Rizi, Ph.D.	
8:10 – 8:25 am	<b>Advances in Pulmonary Imaging: An NHLBI Perspective</b> Lisa Postow, Ph.D. National Institutes of Health
8:25 – 8:45 am	<b>COPD – Functional Imaging for the Surgeon</b> Joel D. Cooper, M.D. University of Pennsylvania
8:45 – 9:05 am	<b>To Enable Artificial Intelligence, Don't Forget the Human</b> Geoffrey D. Rubin, M.D. Duke University
9:05 – 9:25 am	<b>Advances in CT Serving to Provide Lung Structure-Function Relationships with High Resolution and Ultra-low Dose</b> Eric Hoffman, Ph.D. University of Iowa
9:25 – 9:40 am	<b>Discussion</b>
9:40 – 9:55 am	<b>Break</b>
<b>Session II: Keynote Lectures – Part II</b> Moderators: John Mugler, Ph.D. and Sean B. Fain, Ph.D.	
9:55 – 10:15 am	<b>PET/CT Approaches to Guide Lung Cancer Treatment – FDG and Beyond</b> David Mankoff, M.D., Ph.D. University of Pennsylvania
10:15 – 10:35 am	<b>3D Confocal Microscopic Imaging in Mouse Models of Emphysema</b> Wayne Mitzner, Ph.D. Johns Hopkins University
10:35 – 10:55 am	<b>AI in CT Analysis of New Emphysema Sub-types</b> R. Graham Barr, M.D., Ph.D. Columbia University
10:55 – 11:15 am	<b>Emerging Role of Machine Learning in Evaluation of Pulmonary Nodules: Opportunities and Challenges</b> Warren B. Geftter, M.D. University of Pennsylvania
11:15 – 11:35 am	<b>Native Airway Tree Structure and Chronic Obstructive Pulmonary Disease</b> Benjamin M. Smith, M.D. McGill University, Canada

11:35 – 11:55 am	<b>CT and MRI of Mucous Plugs in Asthma: Consequences for the Small Airways</b> Mark L. Schiebler, M.D. University of Wisconsin
11:55 am – 12:10 pm	<b>Discussion</b>
12:10 – 1:00 pm	<b>Lunch</b>
<b>Session III: Graduate Student and Postdoctoral Presentations – Part I</b> Moderator: Kai Ruppert, Ph.D.	
1:00 – 1:10 pm	<b>Imaging Ventilation Inhomogeneity Using Hyperpolarized Gas MRI</b> Hooman Hamedani University of Pennsylvania
1:10 – 1:20 pm	<b>Accelerated MRI Approaches for Gas Exchange Mapping</b> Brandon Zanette, Ph.D. The Hospital for Sick Children (SickKids), Canada
1:20 – 1:30 pm	<b>Hyperpolarized <sup>3</sup>He MRI for Lung Ventilation Imaging in Asthmatic Subjects: Calculating the Temporal Effect of Inhaled Beta-agonists and Inter-user Variability</b> Ummul A. Shammi, Ph.D. University of Missouri
1:30 – 1:40 pm	<b>Quantification of Neonatal Dynamic Tracheal Collapse Via UTE MRI, with Correlation to Later Tracheostomy in Bronchopulmonary Dysplasia</b> Nara S. Higano, Ph.D. Cincinnati Children's Hospital
1:40 – 1:50 pm	<b>Imaging Bronchoconstriction Using Oxygen Enhanced Proton MRI – A Quantitative Biomarker for Asthma</b> Rui Carlos Sa, Ph.D. University of California, San Diego
1:50 – 2:00 pm	<b>Iterative Static Motion Compensated (IS-MoCo) Reconstruction: Application to High Resolution Lung Imaging</b> Xucheng Zhu University of California, San Francisco
2:00 – 2:10 pm	<b>Discussion</b>
2:10 – 2:20 pm	<b>Break</b>
<b>Session IV: Quantitative Lung Imaging and Its Therapeutic Application</b> Moderator: Jim Wild, Ph.D.	
2:20 – 2:40 pm	<b>Quantitative Imaging Parameters from Hyperpolarized-gas MRI: Where Do We Stand with Validation?</b> John Mugler, Ph.D. University of Virginia
2:40 – 3:00 pm	<b>Quantitative Imaging of Lung Function with Proton MRI in Normal Subjects and Patients with Lung Disease</b> Susan Hopkins, M.D., Ph.D. University of California, San Diego
3:00 – 3:20 pm	<b>Delivering on the Promise of Regional Functional Lung Imaging</b> Andreas Fouras, Ph.D. Monash University, Australia

3:20 – 3:40 pm	<b>Molecular Imaging-guide Intratumoral Radiofrequency Hyperthermia-enhanced Direct Gene Therapy for NSCLC</b> Xiaoming Yang, M.D., Ph.D. University of Washington
3:40 – 3:50 pm	<b>Discussion</b>
3:50 – 4:05 pm	<b>Break</b>
<b>Session V: Pulmonary Fibrosis: Biology and Imaging</b> Moderators: Warren B. Gefter, M.D. and Michael F. Beers, M.D.	
4:05 – 4:25 pm	<b>Idiopathic Pulmonary Fibrosis: Diffuse Lung Injury Modified by Lung Mechanics</b> Jeffrey Galvin, M.D. University of Maryland
4:25 – 4:40 pm	<b>New Insights and Emerging Paradigms for Better Understanding Idiopathic Pulmonary Fibrosis: Lessons from Rare Human Mutations and Novel Preclinical Models</b> Michael F. Beers, M.D. University of Pennsylvania
4:40 – 4:55 pm	<b>Type I Collagen Targeted Imaging of Pulmonary Fibrosis: Initial Human Experience</b> Peter Caravan, Ph.D. Massachusetts General Hospital
4:55 – 5:10 pm	<b>Functional and Structural Hyperpolarized Gas and <sup>1</sup>H MRI in the Assessment of Disease Progression and Change in IPF</b> Jim Wild, Ph.D. Sheffield University, United Kingdom
5:10 – 5:25 pm	<b>Imaging Dissolved Phase Hyperpolarized <sup>129</sup>Xe MRI: Applications in Pulmonary Fibrosis</b> Sean B. Fain, Ph.D. University of Wisconsin, Madison
5:25 – 5:40 pm	<b>Tracking CCR2 Monocytes in Lung Fibrosis with PET/CT</b> Delphine L. Chen, M.D. St. Louis Children's Hospital
5:40 – 5:55 pm	<b>Micro CT of <i>Ex-vivo</i> Whole Lungs in IPF</b> John McDonough, Ph.D. Leuven University, Belgium
5:55 – 6:10 pm	<b>Discussion</b>
6:10 – 8:00 pm	<b>Poster Session and Reception</b>
<b>Friday, March 1<sup>st</sup>, 2019</b>	
7:00 – 7:45 am	<b>Continental Breakfast</b>
<b>Session VI: Genetics and Omics of COPD &amp; Risk of Rapid Progression in COPD</b> Moderator: James D. Crapo, M.D.	
7:45 – 8:00 am	<b>Introduction to COPD Gene</b> James D. Crapo, M.D. National Jewish Health

8:00 – 8:15 am	<b>Genetic Findings in COPD</b> Gene Edwin K. Silverman, M.D., Ph.D. Brigham and Women's Hospital
8:15 – 8:30 am	<b>RNA-Seq Findings in COPD</b> Peter J. Castaldi, M.D. Brigham and Women's Hospital
8:30 – 8:45 am	<b>CT-Based Patterns: Relationship to Progression and Mortality</b> David Lynch, M.D. National Jewish Health
8:45 – 9:00 am	<b>Quantitative Imaging of Interstitial Abnormalities</b> Samuel Ash, M.D. Harvard University
9:00 – 9:15 am	<b>Quantitative CT in COPD: Findings from the CanCOLD Study</b> Miranda Kirby, Ph.D. Ryerson University, Canada
9:15 – 9:30 am	<b>Detecting Progression of Airway Disease in COPD</b> Jean-Paul Charbonnier, Ph.D. Radboud University, Netherlands
9:30 – 9:45 am	<b>Discussion</b>
9:45 – 10:00 am	<b>Break</b>
<b>Session VII: Machine Learning and Deep Learning – Imaging in COPD</b> Moderator: David Lynch, M.D.	
10:00 – 10:15 am	<b>Deep Learning in Characterizing Emphysema</b> Stephen M. Humphries, Ph.D. National Jewish Health
10:15 – 10:30 am	<b>Clinical Relevance of Multidimensional Diseases Axes: Application of Unsupervised Factor Analysis in COPD</b> John Hokanson, Ph.D. University of Colorado
10:30 – 10:45 am	<b>Imaging Analysis in Smoking-Related Lung Cancer</b> Jessica C. Sieren, Ph.D. University of Iowa
10:45 – 11:00 am	<b>Pulmonary Vascular Destruction in COPD</b> Farbod N. Rahaghi, M.D., Ph.D. Brigham and Women's Hospital
11:00 – 11:15 am	<b>Characterizing Air Trapping on Expiratory CT Scans</b> Craig J. Galbán, Ph.D. University of Michigan
11:15 – 11:30 am	<b>Deep Learning to Support Lung Segmentation</b> Joseph Reinhardt, Ph.D. University of Iowa
11:30 – 11:45 am	<b>Central Airway Abnormalities in COPD</b> Surya P. Bhatt, M.D. University of Alabama, Birmingham

11:45 am – 12:00 pm	<b>Parametric Response Mapping of Small Airway Disease in COPD</b> MeiLan Han, M.D. University of Michigan
12:00 – 12:15 pm	<b>Discussion</b>
12:15 – 1:05 pm	<b>Lunch</b>
<b>Session VIII: Comorbidities of COPD</b> Moderator: John Hokanson, Ph.D.	
1:05 – 1:20 pm	<b>Correlating Cardiovascular Disease in COPD</b> Greg Kinney, Ph.D. University of Colorado
1:20 – 1:35 pm	<b>Evaluation of Extrapulmonary Disease in COPD</b> Alejandro A. Diaz, M.D. Harvard University
1:35 – 1:50 pm	<b>Bone Disease in COPD</b> Elizabeth Regan, M.D., Ph.D. National Jewish Health
1:50 – 1:55 pm	<b>Discussion</b>
<b>Session IX: Graduate Student and Postdoctoral Presentations – Part II</b> Moderators: Hooman Hamedani and Faraz Amzajerian	
1:55 – 2:05 pm	<b>CT Ventilation Imaging Evaluation 2019 (CTVIE19): An AAPM Grand Challenge</b> Bilal Tahir, Ph.D. Sheffield University, United Kingdom
2:05 – 2:15 pm	<b>Voxel-wise Measurement of Lung Inflation Changes in Prone vs. Supine Positions in Pigs with Lung Injury</b> Yi Xin University of Pennsylvania
2:15 – 2:25 pm	<b>Jacobian Based Ventilation Derived from Lung Proton MRI: Correlation with Ventilation Defects on Hyperpolarized Gas MRI</b> Katherine J. Carey University of Wisconsin, Madison
2:25 – 2:35 pm	<b>Toward 4D MRI of Lung Biomechanics: Highly Accelerated Dynamic Acquisition of 3D Grid-tagged He-3 Lung Images Using Compressed Sensing</b> William J. Garrison University of Virginia
2:35 – 2:45 pm	<b>Distinguishing Cystic Fibrosis Severity Using Dynamic <sup>19</sup>F Lung MR Imaging</b> Sang Hun Chung University of North Carolina, Chapel Hill
2:45 – 2:50 pm	<b>Discussion</b>
2:50 – 3:05 pm	<b>Break</b>
<b>Session X: Imaging Pulmonary Structure and Function</b> Moderator: Susan Hopkins, M.D., Ph.D.	
3:05 – 3:20 pm	<b>Can Imaging Better Elucidate Airway Structure <i>In Vivo</i>?</b> Robert Brown, M.D.

	Johns Hopkins University
3:20 – 3:35 pm	<b>Potential of Hyperpolarized Gas MRI: What Has this Field Achieved so Far?</b> Talissa A. Altes, M.D. University of Missouri
3:35 – 3:50 pm	<b>Observing Pulmonary Function in Real Time Using Hyperpolarized <sup>129</sup>Xe MRI</b> Kai Ruppert, Ph.D. University of Pennsylvania
3:50 – 4:05 pm	<b>Deterioration of Regional Lung Strain and Inflammation during Mechanical Ventilation Studied with PET/CT</b> Marcos Vidal Melo, Ph.D. Massachusetts General Hospital
4:05 – 4:20 pm	<b>Unstable Inflation and Personalized Care in ARDS</b> Maurizio Cereda, M.D. University of Pennsylvania
4:20 – 4:35 pm	<b>Inhaled Gas MR Imaging of Severe Asthma</b> Sarah Svenningsen, Ph.D. McMaster University, Canada
4:35 – 4:45 pm	<b>Discussion</b>
4:45 – 5:00 pm	<b>Break</b>
<b>Session XI: Assessment of Pediatric Pulmonary Disorders</b> Moderators: Giles Santyr, Ph.D., and Joseph Piccione, M.D.	
5:00 – 5:15 pm	<b>Pediatric Pulmonary Imaging with <sup>1</sup>H MRI: Initial Experience</b> Peder Larson, Ph.D. University of California, San Francisco
5:15 – 5:30 pm	<b>The Role of Lung Imaging in Cystic Fibrosis</b> Jennifer Goralski, M.D. University of North Carolina
5:30 – 5:45 pm	<b>Pulmonary MRI in the Neonate: Phenotyping and Outcomes Prediction</b> Jason Woods, Ph.D. Cincinnati Children's Hospital
5:45 – 6:00 pm	<b>Hyperpolarized <sup>129</sup>Xe MRI of Pediatric CF Lung Disease</b> Marcus Couch, Ph.D. The Hospital for Sick Children (SickKids), Canada
6:00 – 6:15 pm	<b>Spatial Identification and Longitudinal Monitoring of Lung Abnormalities with Proton MRI in Adults with Cystic Fibrosis</b> Rebecca Theilman, Ph.D. University of California, San Diego
6:15 – 6:30 pm	<b>Fourier Decomposition MRI in CF</b> Sylvia Nyilas, Ph.D. University of Bern, Switzerland
6:30 – 6:45 pm	<b>Discussion</b>
<b>Saturday, March 2<sup>nd</sup>, 2019</b>	

7:00 – 8:00 am	<b>Continental Breakfast</b>
<b>Session XII: Imaging of Lung Transplant and Cell Therapy</b> Moderator: Joel D. Cooper, M.D.	
8:00 – 8:15 am	<b>Clinical and Experimental Approaches to Improving Outcomes in Lung Transplantation</b> Wayne Hancock, Ph.D. University of Pennsylvania
8:15 – 8:30 am	<b>Lung Transplantation: Donor Risk Assessment and Therapies</b> Edward Cantu, M.D. University of Pennsylvania
8:30 – 8:45 am	<b>Improved Early Detection and Classification of CLAD with Integrated Imaging Approach</b> Rahim R. Rizi, Ph.D. University of Pennsylvania
8:45 – 9:00 am	<b>Limitations and Opportunities for Improvement in Diagnosing Chronic Rejection After Lung Transplantation</b> Joshua Diamond, M.D. University of Pennsylvania
9:00 – 9:15 am	<b>Imaging of Stem Cell Therapies for Lung Injury Using Novel Hyperpolarized MRI Approaches</b> Giles Santyr, Ph.D. The Hospital for Sick Children (SickKids), Canada
9:15 – 9:30 am	<b>Early Lung Ventilation Abnormalities in Pediatric Hematopoietic Stem-cell Transplantation</b> Laura Walkup, Ph.D. Cincinnati Children's Hospital
9:30 – 9:45 am	<b>Discussion</b>
9:45 – 10:00 am	<b>Break</b>
<b>Session XIII: MRI-Based Approaches: Which Nuclei is Best?</b> Moderator: Rahim R. Rizi, Ph.D.	
10:00 – 10:15 am	<b>Correlating Lung Function from Hyperpolarized <math>^{129}\text{Xe}</math> MRI with Underlying Biomolecular Perturbations</b> Y. Michael Shim, M.D. University of Virginia
10:15 – 10:30 am	<b>Using Hyperpolarized <math>^{129}\text{Xe}</math> MRI to Diagnose and Monitor Pulmonary Vascular Disease</b> Bastiaan Driehuys, Ph.D. Duke University
10:30 – 10:45 am	<b>Phase Resolved Functional Lung (PREFUL) MRI: Technique and Clinical Application</b> Jens Vogel-Claussen, M.D. Hannover Medical School, Germany
10:45 – 11:00 am	<b>Assessing Lung Structural and Functional Properties with <math>^{19}\text{F}</math>-MRI of Inhaled Fluorocarbon Gas</b> Pete Thelwall, Ph.D. Newcastle University, United Kingdom
11:00 – 11:15 am	<b>Pulmonary MRI Using Hyperpolarized and Inert Gases and Xenon Biosensor MRI</b>

	Mitchell Albert, Ph.D. Thunder Bay Regional Research Institute, Canada
11:15 – 11:30 am	<b>Quantifying Hyperpolarized <math>^{129}\text{Xe}</math> Dynamics in the Lungs with 3D Radial Keyhole Imaging</b> Zackary I. Cleveland, Ph.D. Cincinnati Children's Hospital
11:30 – 11:45 am	<b>Validation of Accelerated Lung Morphometry Using Single and Multi-breath <math>^{129}\text{Xe}</math> MRI</b> Alexei Ouriadov, Ph.D. Western University, Canada
11:45 am – 12:00 pm	<b>Quantitative Imaging of Gas Uptake and Delivery to Tissues in the Free-Breathing Animal</b> Stephen Kadlecek, Ph.D. University of Pennsylvania
12:00 – 12:15 pm	<b>Discussion</b>
12:15 – 1:05 pm	<b>Lunch</b>
<b>Session XIV: Graduate Student and Postdoctoral Presentations – Part III</b> Moderators: Sarmad Siddiqui and Mehrdad Pourfathi	
1:05 – 1:15 pm	<b>Association Between CT-derived Emphysema/Small Airway Disease and MRI-derived Assessments of Lung Functionality in Advanced COPD Subjects</b> Ryan Baron University of Pennsylvania
1:15 – 1:25 pm	<b>Dynamic Contrast-enhanced (DCE) MRI of Patients with Idiopathic Pulmonary Fibrosis</b> Iris Y. Zhou, Ph.D. Massachusetts General Hospital
1:25 – 1:35 pm	<b>Finite Element Simulations of Hyperpolarised Gas Diffusion MRI in Micro CT Models of the Lung – Linking Imaging and Models at Different Length Scales</b> Fung Chan University of Sheffield, United Kingdom
1:35 – 1:45 pm	<b>A Diagnostic Algorithm for Detecting Pulmonary Arterial Hypertension Using Hyperpolarized <math>^{129}\text{Xe}</math> MRI</b> Ziyi Wang Duke University
1:45 – 1:55 pm	<b>Theoretical Model of the Effect of Superparamagnetic Iron-oxide Nanoparticles on the Apparent Relaxation of <math>^{129}\text{Xe}</math> in the Lungs</b> Vlora Riberdy The Hospital for Sick Children (SickKids), Canada
1:55 – 2:05 pm	<b>Discussion</b>
2:05 – 2:15 pm	<b>Break</b>
<b>Session XV: Producing Hyperpolarized Gas</b> Moderator: Stephen Kadlecek, Ph.D.	
2:15 – 2:30 pm	<b>New Developments in <math>^{129}\text{Xe}</math> and <math>^{131}\text{Xe}</math> Hyperpolarization via Clinical-Scale Stopped-Flow Spin-Exchange Optical Pumping</b> Boyd Goodson, Ph.D. Southern Illinois University



2:30 – 2:45 pm	<b>Hyperpolarized Propane: Clinical-scale Production of Long Lived Spin States, Condensation, and Imaging</b> Eduard Chekmenev, Ph.D. Wayne State University
2:45 – 3:00 pm	<b>Current Status of Commercial HP Xenon Technology, Dissemination and Regulatory Approval</b> Kiarash Emami, Ph.D. Polarean Imaging PLC
3:00 – 3:15 pm	<b>Recent Innovations in Hyperpolarized Xenon Production</b> F. William Hersman, Ph.D. Xemed LLC
3:15 – 3:30 pm	<b>High Throughput <sup>129</sup>Xe SEOP Polarizer</b> Graham Norquay, Ph.D. University of Sheffield, United Kingdom
3:30 – 3:40 pm	<b>Discussion</b>
3:40 – 3:45 pm	<b>Final Remarks</b> Stephen Kadlecek, Ph.D. University of Pennsylvania