



**NATIONAL CANCER INSTITUTE**

Co-Clinical Imaging Research Resources Program (CIRP)

# 2019 Meeting

# BIOLOGY

# Meets

# IMAGING

NCI Shady Grove Campus

May 20, 2019

<https://nciphub.org/groups/cirphub>

Animal  
Models



Co-Clinical  
Trials



Quantitative  
Imaging



Informatics



**8:00 am Introduction**  
Huiming Zhang, PhD

**8:05 am Welcome**  
Janet Eary, MD, Associate Director DCTD

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### **Session 1 CIRP Program**

Huiming Zhang, PhD, Chair

**8:10 am *Promise and Challenges of Co-Clinical Imaging***  
Huiming Zhang, PhD

**8:30 am New CIRP investigator presentation**  
***VU PREDICT***

Charles Manning, PhD, Vanderbilt University

**8:55 am *PENN QUANTITATIVE MRI RESOURCE FOR PANCREATIC CANCER***  
Rong Zhou, PhD, University of Pennsylvania

**9:20 am CIRP team progress**  
***THE DUKE PRECLINICAL RESEARCH RESOURCES FOR QUANTITATIVE IMAGING BIOMARKERS***

Cristian Badea, PhD, Duke University

**9:45 am *WASHINGTON UNIVERSITY CO-CLINICAL IMAGING RESEARCH RESOURCE***  
Kooresh Shoghi, PhD, Washington University at St. Louis

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**10:10 am Break**

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**10:25 am Working Groups Updates**  
Kooresh Shoghi, PhD & Cristian Badea PhD, Chairs

**10:25 am Animal Model and Co-clinical Trial (AMCT) WG**  
Yvonne Mowery, MD/PhD, Duke University

**10:40 am Imaging Acquisition and Data Process (IADP) WG**  
Cristian Badea, PhD, Duke University

**10:55 am Informatics and Outreach (IMOR) WG**  
Daniel Marcus, PhD, Washington University at St. Louis

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### **Session 2 Posters, 2<sup>nd</sup> floor Atrium**

**11: 10 am**

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**12:00 pm Lunch Break**

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### **Session 3 Biology Perspective: Animal model, Translation and Co-clinical Trials**

Kooresh Shoghi, PhD & Charles Manning, PhD, Chairs

**1:00 pm**     ***The Mouse Hospital and Co-Clinical Paradigm: Propelling the development of Precision medicine***

Sean Clohessy, PhD, Harvard Medical School

**1:30 pm**     ***Patient-Derived Xenografts and Organoids as Models of Therapy Response in Breast Cancer***

Bryan Welm, PhD, University of Utah

**1:50 pm**     ***Using humanized models to study response to therapy in human tumors***

Ann Richmond, PhD, Vanderbilt University

**2:10 pm**     ***Bench Meets Bedside: Using Science to Inform Clinical Trials***

Jordan Berlin, MD, Vanderbilt University

**2:30 pm**     **Panel discussions, Challenges and Strategies Toward Best Practices**

**Chairs:** Kooresh Shoghi, PhD & Charles Manning, PhD

**Panel members:** Sean Clohessy, PhD, Bryan Welm, PhD, Ann Richmond, PhD,

Jordan Berlin, MD, Yvonne Mowery, MD/PhD, Emma Furth, MD

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**3:10 pm**     **Break**

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## **Section 4 Imaging Perspective: Quantification, Validations and Data Format**

Cristian Badea, PhD & Rong Zhou, PhD, Chairs

**3:25 pm**     ***Improving quantitative accuracy of DWI in multicenter trials: strategies & suggestions for achieve best practice***

Tom Chenevert, PhD, University of Michigan

**3:45 pm**     ***Quantitative PET imaging in clinical, pre-clinical, and co-clinical trials***

Paul, Kinahan, PhD, University of Washington

**4:05 pm**     ***Lessons learned in QIBA: Developing approaches to standardization and metrology***

Dan Sullivan, MD, Duke University

**4:25 pm**     ***DICOM for small animal pre-clinical imaging and whole slide digital pathology,***

David Clunie, PhD, PixelMed Publishing LLC

**4:45 pm**     **Panel discussions, Challenges and Strategies Toward Best Practices**

**Chairs:** Cristian Badea, PhD, & Rong Zhou, PhD

**Panel members:** Tom Chenevert, PhD, Paul Kinahan, PhD, Dan Sullivan, MD,

David Clunie, PhD, Stephen Pickup, PhD, Daniel Marcus, PhD, John Freymann, PhD

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**5:25 pm**     **Program Wrap-up**

**5:30 pm**     **End of first day**

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## **Posters, 11:10 am -12:00 pm, 2<sup>nd</sup> floor Atrium**

1. A "Mouse Hospital" for Preclinical Testing of Diagnostic and Treatment Modalities in Pancreatic Ductal Adenocarcinoma

Cynthia Clendenin, Rina Sor, et al., University of Pennsylvania

- 2. Humanized Mouse Models for Oncology Co-Clinical Trials**  
Anna Vilgelm, Ann Richmond, Tennessee Valley Healthcare System, Vanderbilt University
- 3. NCI's Patient Derived Models Repository**  
MG Hollingshead, YA Evrard, et al. Frederick National Laboratory for Cancer Research, NCI
- 4. Metabolic Imaging Comparisons of Patient-derived Models of Renal Cell Carcinoma**  
Renuka Sriram, Hongjuan Zhao, et al., UCSF, Stanford University
- 5. Biomimetic phantoms for evaluation of radiomic and AI-based analysis of multiparametric MRI**  
Stephen E. Russek, Samuel D. Oberdick, et al., National Institute of Standards and Technology
- 6. Quantitative Dynamic Contrast Enhanced MRI in Pre-clinical Models of Pancreatic Cancer: Methods Development**  
Stephen Pickup, Hee Kwon Song, et al., University of Pennsylvania
- 7. Optimization and Test-Retest Performance of a One-Hour Multi-Parametric MR Image Acquisition Pipeline of Orthotopic Triple Negative Breast Cancer Patient-Derived Tumor Xenografts.**  
Xia Ge, James D. Quirk, et al., Washington University at St. Louis
- 8. To gate or not to gate: an evaluation of respiratory gating techniques to improve volume measurement of murine lung tumors in micro-CT imaging**  
S.J. Blocker, M. D. Holbrook, et al., Duke University
- 9. Washington University Co-Clinical Imaging Research Resource (WU-C2IR2)**  
Kooreh I Shoghi, Joseph Ackerman, et al., Washington University at St. Louis
- 10. Quantitative FDG-PET/CT Imaging of Response to Docetaxel/Carboplatin Therapy in Orthotopic Triple Negative Breast Cancer Patient-Derived Tumor Xenografts**  
Madhusudan Savaikar, Timothy Whitehead, et al., Washington University at St. Louis
- 11. Multi-platform preclinical magnetic resonance imaging to identify and characterize tumor heterogeneity**  
S.J. Blocker, C.T. Badea, etc., Duke University
- 12. Elucidating Mechanism of Action in Cancer Drug Discovery: Role of PET Imaging in Co-Clinical Imaging Trials**  
Allison S. Cohen, Ann Richmond, Vanderbilt University
- 13. Dynamic contrast-enhanced MRI detects responses to stroma-directed therapy in mouse models of pancreatic ductal adenocarcinoma**  
Jianbo Cao, Stephen Pickup, et al., University of Pennsylvania
- 14. Multi-modal MRI segmentation of sarcoma tumors using convolutional neural networks**  
M. D. Holbrook, S.J. Blocker, et al., Duke University
- 15. Patient Derived Models Repository (PDMR) and DICOM Supplement 187**  
Joseph D. Kalen, L.A. Riffle, et al., Frederick National Laboratory for Cancer Research, National Cancer Institute, PixelMed Publishing, LLC,
- 16. An Open Source PET Imaging Analysis Tool**  
Charles Dupont, Dan Ayers, et al., Vanderbilt University
- 17. Quantitative Image Analysis Tools for Co-Clinical Trials**  
Jayashree Kalpathy-Cramer, Harvard Medical School
- 18. Applying Machine/Deep Learning in Cancer Imaging Studies**  
Yong Fan, PhD, Hongming Li, et al., University of Pennsylvania
- 19. Data and Services Provided by NCI's Cancer Imaging Archive**  
John Freymann<sup>1</sup>, Bill Bennett<sup>2</sup>, <sup>1</sup>Frederick National Laboratory for Cancer Research, <sup>2</sup>University of Arkansas
- 20. Expansion of XNAT to Support Preclinical Imaging Workflows: Towards an Integrated Co-Clinical Imaging Informatics Platform**  
Ehsan Mahmoudzadeh, Jenny Gurney, et al., Washington University at St. Louis
- 21. Informatics Architecture within VU PREDICT: Status and Plans**  
Gregory D. Ayers, Lena Hussain, et al., Vanderbilt University



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