ISMRM | EXTENDING VISION, EXPANDING MINDS & IMPROVING LIFE THROUGH MR

International Society for Magnetic Resonance in Medicine • www.ismrm.org

ISMRM Workshop on **Cancer Imaging: From Discovery to Diagnosis**

01-04 November 2022
Asilomar Conference Grounds
Pacific Grove, CA, USA

www.ismrm.org

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ORGANIZING COMMITTEE

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Chang Gung Memorial Hospital
Linkou, Taiwan

Janine P. Wijnen, Ph.D.
University Medical Centre Utrecht
Utrecht, The Netherlands

OVERVIEW

This workshop, organized by the ISMRM MR of Cancer Working Group, will focus on the development and application of novel MRI/MRS acquisition and analysis technologies for cancer. At this bi-annual workshop, we will address and highlight strategies for successfully traversing the translational pipeline. Topics will include development and validation of new cancer imaging methods, analysis tools and probes, preclinical application, first-in-human studies, image-guided therapies, clinical trial evaluation, quality assurance and benchmarking, and clinical best practices.

The program will feature invited scientific presentations from a diverse group of experts in technical innovation and clinical practice (physicians and ISMRT members), in addition to proffered papers and poster sessions. The Bill Negendank Young Investigator Awards, for which students, trainees, and post-doctoral fellows are eligible, will also be awarded based on the quality of the presented work.

TARGET AUDIENCE

The workshop is designed for basic scientists, physicians, regulators, technologists, students, trainees, and postdoctoral fellows with an interest in cancer MRI/MRS.

EDUCATIONAL OBJECTIVES

Upon completion of this activity, participants should be able to:

- Describe novel cancer imaging methods and contrast mechanisms;
- Describe advancements in clinical biomarker development;
- Identify opportunities for image-guided adaptive therapy;
- Recognize the role and challenges of using machine learning, artificial intelligence and mathematical modeling in cancer imaging applications;
- Explain the role of quality assurance, standardization and benchmarking in clinical cancer imaging; and
- Identify best practices for translation of cancer imaging methods into the clinic.

SPEAKER UPLOAD INFORMATION (Audiovisual Preview)

The audio-visual staff will be located in the back of the meeting room.
Uploading presentations is available on a first-come, first-served basis. Hours are:

- Tuesday, 01 November 2022: 16:00-18:00
- Wednesday-Friday, 2-4 November 2022: 7:30-8:30

Please see program for additional times (breaks & lunch).

PROGRAM CREDIT DESIGNATION

The International Society for Magnetic Resonance in Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. This workshop does not offer CME credits.

The International Society for MR Radiographers & Technologists (ISMRT), A Section of the ISMRM, is recognized by the American Registry of Radiologic Technologists (ARRT) as a Recognized Continuing Education Evaluation Mechanism (RCEEM). This workshop does not offer CE credits.

CERTIFICATE OF PARTICIPATION

To claim your credit or Certificate of Participation for this workshop, log into the ISMRM membership portal at www.ismrm.org, then click on "My Meeting Evaluations" on the menu, select "View Meeting Evaluation" by the appropriate meeting name, and follow the instructions provided.

DECLARATION OF FINANCIAL RELATIONSHIPS

The ISMRM is committed to:

1. Ensuring balance, independence, objectivity, and scientific rigor in all Continuing Medical Education programs; and
2. Presenting CME activities that promote improvements or quality in healthcare and are independent of commercial interests.

Therefore, it is the policy of the Society that any person who has influence over the content of a program designated for *AMA PRA Category 1 Credits*™ must disclose any real or apparent financial interest or other relationship (i.e., grants, research support, consulting fee, royalty, honorarium for promotional speakers' bureau, ownership interest) that they or their spouse/partner have had in the last 12 months with "any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients."

The ISMRM does not imply that such financial interests or relationships are inherently improper or that such interests or relationships would prevent the speaker or organizer from making an objective contribution. However, it is imperative that such financial interests or relationships be identified so that potential conflicts can be resolved before the program, and participants at the CME activity may have these facts fully disclosed in advance. It then remains for the audience to determine whether an individual's outside interests may reflect a possible bias in either the exposition or the conclusions presented.

Following are the names of all presenters, committee members, and other organizers who had influence upon program content. If individuals have disclosed real or apparent financial interests or relationships, the interests or relationships are described.

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Masako Kataoka, M.D., Ph.D. — No relevant relationships to disclose
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Peter S. LaViolette, Ph.D. — No relevant relationships to disclose
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Simon P. Robinson, Ph.D. — No relationships to disclose
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Junzhong Xu, Ph.D. — No relationships to disclose

SPEAKERS

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Henk M. De Feyter, Ph.D. — No relationships to disclose
Mary Ellen Giger, Ph.D. — Grants & Research Support: Qlarity Imaging; Editor-in-Chief: Journal of Medical Imaging, SPIE; Honoraria
Kristine Glunde, Ph.D. — No relationships to disclose
Saumya Gurbani, Ph.D. — No relationships to disclose
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ISMRM & ISMRT ANNUAL MEETING & EXHIBITION

03-08 JUNE **2023** | TORONTO

ABSTRACT DEADLINE: **09 NOVEMBER 2022**

Registration & Setup: Tuesday, 01 November 2022		
14:00-18:00	Registration	
16:00-18:00	Speaker Upload Available	
18:00	Dinner for attendees staying at Asilomar	
Day 1: Wednesday, 02 November 2022		
07:30	Registration & Speaker Upload Available Breakfast for attendees staying at Asilomar	
08:30	Welcome & Opening Statements	
Session 1: Emerging Cancer Imaging Methods & Probes: Preclinical Validation		
Moderators: Joel R. Garbow, Ph.D. & Chengyue Wu, Ph.D.		
08:40	*Theranostic MRI of Cancer Using Chemical Exchange Saturation Transfer*	Kristine Glunde, Ph.D. Johns Hopkins University Baltimore, MD, USA
09:10	Invited Young Scientist	Pavithra Viswanath, Ph.D. University of California, San Francisco San Francisco, CA, USA
Proffered Papers - Oral Session		
09:25	*Characterizing Tumor Microenvironment in Mouse Models of Pancreatic Ductal Adenocarcinoma Using Quantitative Multiparametric MRI*	Ramesh Paudyal, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
09:40	*MT218: A Targeted Contrast Agent for Diagnostic & Prognostic MRI of Cancer*	Zheng-Rong Lu, Ph.D. Case Western Reserve University Cleveland, OH, USA
09:55	*Imaging Intra-Tumoral Heterogeneity Using Diffusion MRI*	Xiaohong Joe Zhou, Ph.D. University of Illinois College of Medicine at Chicago Chicago, IL, USA
10:10	Break & Speaker Upload Available	
Session 2: Emerging Cancer Imaging Methods & Probes: First-in-Human Studies		
Moderators: Samuel Bobholz, B.Sc. & Masako Kataoka, M.D., Ph.D.		
10:30	*Imaging Metabolism of Deuterated Glucose in Patients with Brain Tumors*	Henk M. De Feyter, Ph.D. Yale University of Medicine New Haven, CT, USA
11:00	*Saturation Transfer MRI of Brain Tumor*	Hye Young Heo, Ph.D. Johns Hopkins University Baltimore, MD, USA
Proffered Papers - Oral Session		
11:15	*Whole-Body MRI for Noninvasive Detection & Therapy Response Assessment: Application in Multiple Myeloma*	Sheng-Qing Lin, B.Sc. University of Texas Southwestern Medical Center Dallas, TX, USA
11:30	*Whole-Brain Multi-Parametric Mapping & Lesion Segmentation of Contrast Enhancing Gliomas Without the Injection of Contrast Agent*	Jing Liu, Ph.D. University of California, San Francisco San Francisco, CA, USA

11:45	*Application of Ultrafast DCE-MRI to Distinguish Benign & Malignant Breast Lesions in a Clinical Setting*	Anum Kazerouni, Ph.D. University of Washington Seattle, WA, USA
12:00	Lunch & Speaker Upload Available	
Session 3: Clinical Applications of Cancer Imaging: Early Detection, Stratification, Genotyping & Phenotyping		
	Moderator: Peter S. LaViolette, Ph.D.	
13:30	*Radiogenomic Characterization of mpMRI Habitats for Effective Management of Prostate Cancer*	Radka Stoyanova, Ph.D. University of Miami Miami, FL, USA
14:00	*Precision Oncology with MR Spectroscopic Imaging: 2HG Imaging of Mutant IDH Glioma & Beyond*	Ovidiu Andronesi, M.D., Ph.D. Massachusetts General Hospital Charlestown, MA, USA
Proffered Papers - Oral Session		
14:15	*mpMRI Radiomic Features of the Prostate Predict for Radiation Sensitivity Genomic Signature*	Mohammad Alhusseini, Ph.D. University of Miami Miami, FL, USA
14:30	*Pre-Treatment Diffusion Kurtosis Imaging for Predicting Locoregional Failure in Nasopharyngeal Cancer*	Ramesh Paudyal, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
14:45	*Radio-Pathomic Maps of Glioblastoma Cellularity Highlight Regions Outside Contrast Enhancement That Recur Early*	Aleksandra Winiarz, B.Sc. Medical College of Wisconsin Milwaukee, WI, USA
15:00	Break & Speaker Upload Available	
15:30	Power Pitch Session *(No CME Available)* See page 12 &13 for poster list	
16:30	Poster Viewing Session *(No CME Available)* Drinks	
18:00	Adjournment Dinner for attendees staying at Asilomar	

Day 2: Thursday, 03 November 2022

07:30	Registration & Speaker Upload Available Breakfast for attendees staying at Asilomar	
08:30	The Negendank Lecture *Magnetic Resonance Metabolic Imaging of Brain Tumors: Detecting Drivers of Gliomagenesis*	Sabrina Ronen, Ph.D. University of California, San Francisco San Francisco, CA, USA
Session 4: Preclinical Applications: Novel Therapeutic Paradigms		
	Moderators: Jonghyun Bae, M.Sc. & Harish Poptani, Ph.D.	
09:00	*Monitoring Cancer Immunotherapy with Molecular MRI*	Heike E. Daldrup-Link, M.D., Ph.D. Stanford University Stanford, CA, USA
09:30	*Metabolic Modulation Towards Improved Outcome in Cancer Therapy*	Kavindra Nath, Ph.D. University of Pennsylvania Philadelphia, PA, USA
Proffered Papers - Oral Session		
09:45	*Changes in Cell Size Measured by Diffusion MRI Indicate Chemotherapy Response in Breast Cancer*	Xiaoyu Jiang, Ph.D. Vanderbilt University Institute of Imaging Science Nashville, TN, USA

ISMRM RESEARCH & EDUCATION FUND

The **ISMRM Research & Education Fund** was established to support the next generation of specialists in the field of magnetic resonance regardless of scientific disclipline, geography, country of origin and resources available.

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AT TODAY'S WORKSHOP!

Collin Buelo, M.Sc.

Anum Kazerouni, Ph.D.

Annemarie Knill, B.Sc.

Sheng Qing Lin, B.Sc

Calin Nicolescu, B.Sc.

Kyu-Ho Song, Ph.D.

Chengyue Wu, Ph.D.

Limin Zhou, B.Sc.

10:00	*Targeting M2-like Tumor Associated Macrophages for Cancer Imaging & Theranostics*	Yuancheng Li, Ph.D. Emory University School of Medicine Atlanta, GA, USA
10:15	Break & Speaker Upload Available	
Session 5: Clinical Applications of Cancer Imaging: Biomarkers for Predicting & Monitoring Therapy Response		
	Moderators: E. James Delikatny, Ph.D. & Eddy Solomon, Ph.D.	
10:45	*MRI Markers in Multicenter Breast Cancer Therapy Trials: Past, Present & Future*	Savannah Partridge, Ph.D. University of Washington Seattle, WA, USA
11:15	Invited Young Scientist	Viola Rieke, Ph.D. University of Utah Salt Lake City, UT, USA
Proffered Papers - Oral Session		
11:30	*Compartmental Analysis of Glioblastoma Cellularity Using Autopsy-Based Radio-Pathomic Maps Identifies IDH1 Mutation Status*	Samuel Bobholz, Ph.D. Medical College of Wisconsin Milwaukee, WI, USA
11:45	*MRI-Based Digital Twins Forecast Patient-Specific Treatment Responses to Neoadjuvant Chemotherapy in Triple-Negative Breast Cancer*	Chengyue Wu, Ph.D. The University of Texas at Austin Austin, TX, USA
12:00	*Longitudinal Multi-Parametric WB-MRI Can Be Used to Quantify the Effects of Immunotherapy on Normal Tissues in Patients with Metastatic Melanoma*	Annemarie Knill, B.Sc. The Institute of Cancer Research, London London, England, UK
12:15	Lunch & Speaker Upload Available	
13:30	Break / Activities (until 16:00)	
Session 6: Clinical Applications of Cancer Imaging: Image-Guided & Adaptive Therapy		
	Moderator: C. Chad Quarles, Ph.D. & Junzhong Xu, Ph.D.	
16:00	*Cancer Imaging: From Prognostic & Predictive Imaging Biomarkers to Image-Guided Adaptive Therapy*	Yue Cao, Ph.D. University of Michigan Ann Arbor, MI, USA
16:30	*A Multi-Institutional Pilot Study of Spectroscopy-Guided Radiation Dose Escalation in Patients with Glioblastoma*	Saumya Gurbani, Ph.D. Emory University Atlanta, GA, USA
Proffered Papers - Oral Session		
16:45	*Longitudinal Changes of Multiparametric MRI Features Are Associated with Radiation Therapy Outcome for Prostate Cancer Patients Treated with MRI-Guided Lattice Extreme Ablative Dose (LEAD) Boost Radiotherapy*	Ahmad Algohary, Ph.D. University of Miami Miami, FL, USA
17:00	*Incorporating Predictions of Tumor Recurrence for Radiation Target Volume Definition Using Pre-Treatment Metabolic & Physiologic MRI & Machine Learning in Patients with Glioblastoma*	Nate Tran, M.Sc. University of California, San Francisco San Francisco, CA, USA
17:15	*Pathways for Clinical Translation: Clinical Best Practices*	Brandy Reed, M.B.A.,R.T.(R)(MR) University of Texas MD Anderson Cancer Center Houston, TX, USA
17:30	Adjournment	
18:00	Dinner for attendees staying at Asilomar	

Day 3: Friday, 04 November 2022		
07:30	Registration & Speaker Upload Available Breakfast for attendees staying at Asilomar	
Session 7: Cancer Image Analysis: Omics, Mathematical Modeling & Deep Learning		
Moderators: Wen Li, Ph.D. & Janine Lupo, Ph.D.		
08:30	Keynote	Maryellen Giger, Ph.D. University of Chicago Chicago, IL, USA
09:00	*Towards MRI-Based Digital Twins for Breast Cancer*	Thomas Yankeelov, Ph.D. University of Texas at Austin Austin, TX, USA
09:30	Invited Young Scientist	Pallavi Tiwari, Ph.D. University of Wisconsin Madison, WI, USA
Proffered Papers - Oral Session		
09:45	*Estimation of Fatty Acid Composition in Mammary Adipose Tissue Using Physics-informed Deep Learning*	Suneeta Chaudhary, Ph.D. Cornell University New York, NY, USA
10:00	*Spatial Mapping of Treatment-Induced Effects in Recurrent Glioblastoma with Multi-parametric MRI & Deep Learning*	Jacob Ellison, B.Sc., M.Sc. University of California, San Francisco San Francisco, CA, USA
10:15	Break & Speaker Upload Available	
Session 8: Pathways for Clinical Translation: Quality Assurance, Standardization & Benchmarking		
Moderators: Savannah Duenweg, B.Sc., & Alexey Samsonov, Ph.D.		
10:40	*Challenges & Opportunities in Clinical Translation of Quantitative MRI*	Amita Shukla-Dave, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
11:10	*How Should We Do Quantitative MRI Quality Assurance?*	Kathryn Keenan, Ph.D. National Institute of Standards & Technology Boulder, CO, USA
Proffered Papers - Oral Session		
11:25	*Qualitative & Quantitative Performance Evaluation of Synthetic MRI: An Emerging Rapid Method for Head & Neck Imaging*	Amaresha Konar Shridhar, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
11:40	*Digital Reference Object (DRO) Toolkit for Evaluation of Quantitative Breast Dynamic Contrast-Enhanced (DCE)-MRI Methods*	Jonghyun Bae, M.Sc. Weill Cornell Medicine New York, NY, USA
11:55	Closing Remarks	
12:00	Adjournment Lunch available at Asilomar Cafeteria (until 13:00)	

Take the 5-minute on-site survey!
See the registration desk for questions. *This survey is not for CME credits.*

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Upcoming **ISMRM** Workshops

ISMRM Workshop on Data Sampling & Image Reconstruction

08-11 January 2023 | Sedona, AZ, USA

SCMR-ISMRM Co-Provided Workshop on Cutting-Edge Metabolic & Endogenous Contrast CMR

25-26 January 2023 | San Diego, CA, USA

ISMRM Workshop on MR Imaging of X-Nuclei (23Na & Friends): From Controversies to Potential Clinical Applications, Part II

27-30 March 2023 | Marseille, France

**Dates and locations subject to change.*

Visit **www.ismrm.org** for more information.

POSTERS

POSTER	TITLE	AUTHOR
1	*Identification of a Single-Dose, Low-Flip Angle Based CBV Threshold for Fractional Tumor Burden Mapping in Recurrent Glioblastoma*	Aliya Anil, M.Sc. Barrow Neurological Institute Houston, TX, USA
2	*Hypocellular Regions on Radio-Pathomic Maps of Glioma Pathology are Associated with Bevacizumab Treatment Response*	Samuel Bobholz, Ph.D. Medical College of Wisconsin Wauwatosa, WI, USA
3	*Longitudinal Characterization of Anatomic & Functional MRI Changes Following Hemi-Gland High Intensity Focused Ultrasound (HIFU) Therapy & Implications for Prostate Cancer Surveillance*	Adrian Breto, B.Sc. University of Miami Miami, FL, USA
4	*Reproducibility of Liver Iron Quantification Using Quantitative Susceptibility Mapping*	Collin Buelo, M.Sc. University of Wisconsin-Madison Madison, MI, USA
5	*Discriminating Pseudoprogression from true Progression in Glioblastomas Using Multiparametric MRI & MGMT Methylation Status*	Sanjeev Chawla, Ph.D., DABMP Perelman School of Medicine at the University of Pennsylvania Philadelphia, PA
6	*T2-Weighted Image Intensity Normalization Methods Comparison in Prostate Cancer MRI with & Without the use of an Endorectal Coil*	Savannah Duenweg, B.Sc. Medical College of Wisconsin Milwaukee, WI, USA
7	*Multi-Scanner T2-Weighted Imaging Normalization Methods Comparison in Prostate Cancer MRI*	Savannah Duenweg, B.Sc. Medical College of Wisconsin Milwaukee, WI, USA
8	*Quantitative Relaxometry of Brain Metastases & Normal Tissues Using an Emerging Rapid MR Fingerprinting Method*	Amaresha Konar Shridhar, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
9	*Evaluation of Tumor Metabolism in Recurrent Lower-Grade Glioma Patients*	Yan Li, Ph.D. University of California San Francisco San Francisco, CA, USA
10	*Chemical Exchange Saturation Transfer (CEST) MRI for Differentiating Radiation Necrosis from Tumour Progression in Brain Metastasis – Application in a Clinical Setting*	Leedan Murray, B.Sc. Sunnybrook Research Institute Toronto, ON, Canada
11	*Molecular MR Image-Guided Therapy for Breast Cancer Using Targeted SiRNA Nanoparticles*	Calin Nicolescu, B.Sc. Case Western Reserve University Cleveland, OH, USA
12	*Shining New light on a Familiar Target: ChoKa-Targeted NIR Fluorophore for Optical Surgical Navigation in Canine Patients with Spontaneous Lung Cancer*	Sofya Osharovich, B.Sc. University of Pennsylvania Philadelphia, PA, USA
13	*Fitting Kinetic Rate Constants in Metabolite-Specific bSSFP Hyperpolarized [1–13C]Pyruvate MRI for Renal Cell Carcinoma*	Sule Sahin, B.Sc. University of California, San Francisco San Francisco, CA, USA
14	*Time-Dependent Diffusivity & Kurtosis in Phantoms & Patients with Head & Neck Cancer*	Eddy Solomon, Ph.D. Weill Cornell Medicine New York, NY, USA
15	*Distinguishing Radiation Necrosis vs. Recurrent Brain Tumor – 1H MTR & 2H MRS*	Kyu-Ho Song, Ph.D. Washington University in St. Louis St. Louis, MO, USA
16	*SOX2 Positive Glioblastoma Invasion Beyond Contrast Enhancement Detected with Radio-Pathomic Maps of Cell Density*	Margaret Stebbins, B.Sc. Medical College of Wisconsin Milwaukee, WI, USA

POSTERS

POSTER	TITLE	AUTHOR
17	*Tumor Probability Maps Derived from Conventional MRI & Machine Learning Predict the Location of Glioblastoma Invasion Beyond Contrast Enhancement Confirmed with 5-ALA-Guided Resection*	Aleksandra Winiarz, B.Sc. Medical College of Wisconsin Milwaukee, WI, USA
18	*Non-Contrast Arterial Spin Labeling & Dynamic Susceptibility Contrast Perfusion-Weighted MR Imaging: Are They Competitive or Complementary in Glioblastoma?*	Limin Zhou, B.Sc. University of Texas, Southwestern Medical Center Dallas, TX, USA
19	*Time-Dependent Diffusion MRI in Evaluating Recurrent High-Grade Glioma Versus Treatment Effect: Technique Feasibility*	Ante Zhu, Ph.D. General Electric Research Niskayuna, NY, USA

The ISMRM wishes to thank the following supporters for their contribution to the ISMRM Workshop on Cancer Imaging: From Discovery to Diagnosis:

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