

— INTERNATIONAL SOCIETY FOR —
ISMRRM
MAGNETIC RESONANCE IN MEDICINE

ONE
COMMUNITY
FOR CLINICIANS
AND SCIENTISTS

ISMRRM WORKSHOP ON MR Spectroscopy: Frontiers in Molecular & Metabolic Imaging

15-18 OCTOBER 2024

Mass General Brigham
Assembly Row
Boston, MA, USA



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OVERVIEW

Magnetic resonance spectroscopy (MRS) can simultaneously image up to 20 metabolites in the brain and assess their concentration and the dynamic change of their concentrations under functional tasks. MRS is capable of measuring intrinsic metabolism non-invasively without the need of contrast agents and can probe metabolic enzymatic rates that are not accessible by other imaging techniques. Numerous studies have demonstrated the considerable value of MRS for clinical applications. Great progress has been realized over the last few years in the performance of MRS resulting in fast and high-resolution imaging methods with robust performance in clinical and research investigations.

The ability to probe metabolic alterations is important to understand disease mechanisms and for patient management, including diagnosis, treatment planning, and treatment response assessment. In addition, MRS allows to probe metabolism in healthy individuals and in healthy tissues of patients providing important information about normal function.

The program will combine lecture sessions provided by experts in the field and abstract sessions to present the work of attendees. This meeting will provide a forum to share best practices, disseminate knowledge and methodology, and create consensus and standardization through panel discussions and practical demonstrations.

TARGET AUDIENCE

Scientists and clinicians interested in learning the state of the art of in-vivo MRS to image metabolism under healthy and disease conditions.

LEARNING OBJECTIVES

This workshop will present the state of the art in technical performance and clinical applications of MRS, which will be relevant to a broad audience of scientists and clinicians. In particular, the topics of interest include: the fundamentals of MRS methodology; biological and clinical relevance of metabolism; advanced MRS methodology; and clinical and pre-clinical applications in healthy conditions and diseases such as cancer, neuropsychiatric disorders, and inborn errors of metabolism. Practical sessions of MRS imaging protocols and data analysis will be demonstrated during this workshop as well.

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

- Describe metabolism in healthy state and metabolic alterations in disease pathology;
- Describe acquisition and processing steps of MRS, including pulse sequences and processing software;
- Summarize state-of-the-art advanced 1H-MRSI methodology;
- Describe X-nuclei MRS imaging;
- Describe hyperpolarization techniques; and
- Explain complementary modalities of metabolic and molecular imaging.

SPEAKER UPLOAD INFORMATION (Audiovisual Preview)

Uploading presentations is available on a first-come, first-served basis. Hours are:

- Tuesday, 15 October 2024 07:30-08:00
- Wednesday, 16 October 2024 07:30-08:30
- Thursday, 17 October 2024 07:30-08:30
- Friday, 18 October 2024 07:30-08:30

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. The International Society for Magnetic Resonance in Medicine designates this live activity for a maximum of *10.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

The American Medical Association has an agreement of mutual recognition of Continuing Medical Education (CME) credits with the European Union of Medical Specialists (UEMS), the accreditation body for European countries. Physicians interested in converting *AMA PRA Category 1 Credits™* to UEMS-European Accreditation Council for Continuing Medical Education CME credits (ECMECs) should contact the UEMS at mutualrecognition@uems.eu.

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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.

CLAIMING CREDIT

To obtain your credit for the workshop, log in to the ISMRM membership portal at www.ismrm.org, click the "Session Evaluations for Certificates" menu option, 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.

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Christoph Juchem, Ph. D.Research Agreement: SRA with Merck; Research Support: General Electric

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Day 1: TUESDAY, 15 OCTOBER 2024 (5.75 CME AVAILABLE)

07:30	Registration & Speaker Upload Available	
Session 1: Basics of MRS(I) Part I: Acquisition & Reconstruction		
<i>Moderators: Fei Du, Ph.D. & Alexander Lin, Ph.D.</i>		
08:00	<i>Opening Statements</i>	Ovidiu C. Andronesi, M.D., Ph.D. Chao Ma, Ph.D. Bruce Rosen, Ph.D.
08:30	<i>Metabolism & MRS</i>	Douglas Rothman, Ph.D. Yale University School of Medicine New Haven, CT, USA
08:50	<i>MRS Data Acquisition</i>	Ulrike Dydak, Ph.D. Purdue University School of Health Services West Lafayette, IN, USA
09:10	<i>MRS Data Processing</i>	William Clarke, D.Phil. University of Oxford Oxford, England, UK
09:30	<i>Spectral Fitting & Quantification</i>	Georg Oeltzschner, Ph.D. Johns Hopkins University Baltimore, MD, USA
09:50	<i>Standardization</i>	Dinesh Deelchand, Ph.D. University of Minnesota Minneapolis, MN, USA
10:10	Break & Speaker Upload Available	
Proffered Papers - Oral Session		
<i>Moderators: Erin MacMillan Ph.D. & Diana Georgiana Rotaru Ph.D.</i>		
10:40	<i>Chronological Age & Sex Effects on Brain Neurochemistry in Adolescents</i>	Anjali Balaganesh, Diploma Georgia Institute of Technology Atlanta, GA, USA
10:50	<i>Linear Combination Modelling of High-Resolution Magic-Angel Spinning (HR-MAS) NMR Spectra from Human Cerebral Organoids</i>	Alejandra Castilla Bolanos, Ph.D. Student University of Toronto Toronto, ON, Canada
11:00	<i>Denosing for Physical Fidelity: Feature Enhancement via Spatial Conditioning on Multi-Coil Transients Improves Metabolite Quantification of Noisy Spectra</i>	John LaMaster, M.Sc. Munich Institute of Biomedical Engineering, Technical University of Munich Munich, Germany
11:10	<i>Metabolite T1 Relaxation Times Across the Adult Lifespan in a Large Multi Site Cohort</i>	Saipavitra Murali-Manohar, Ph.D. Johns Hopkins University School of Medicine Baltimore, MD, USA
11:20	<i>FID-A on FIRE: Online Reconstruction of MRS & MRSI Data Using the FID-A Toolkit via the Siemens FIRE WIP</i>	Peter Truong, M.Sc. Sunnybrook Research Institute Toronto, ON, Canada
11:30	<i>Keynote Address: MRS Historical Perspective</i>	Ivan Tkac, Ph.D. University of Minnesota Minneapolis, MN, USA

12:10	Power Pitches	
Poster No. 19	<i>Contributions of Visual Cortex Metabolism to Visual Field Loss Patterns in Glaucoma using Archetypal & Information Gain Analyses</i>	Ivan Tkac, Ph.D. University of Minnesota Minneapolis, MN, USA
Poster No. 25	<i>Data-Driven Determination of Optimal Basis Set Composition Using Group-Based Model Selection</i>	Christopher Davis-Jenkins, Ph.D. John Hopkins University Baltimore, MD, USA
Poster No. 43	<i>Functional Magnetic Resonance Spectroscopy at 7 Tesla: Examining Processing Speed & Glutamate Dynamics in Cognitive Function</i>	Antonia Kaiser, Ph.D. Center for Biomedical Imaging Lausanne, Switzerland
Poster No. 71	<i>A Water Relaxation Atlas for Age- & Region-Specific Metabolite Concentration Correction</i>	Gizeaddis Simegn, Ph.D. Johns Hopkins University Baltimore, MD, USA
Poster No. 86	<i>Measurement of T1 & T2 Relaxation Time Constants of NAD+ & NR/NMN in Skeletal Muscle at 7T</i>	Neil Wilson, Ph.D. University of Pennsylvania Philadelphia, PA, USA
Poster No. 88	<i>Q-MRS: A Deep Learning Framework for Quantitative Magnetic Resonance Spectra Analysis</i>	Christopher Wu M.Sc. Columbia University New York, NY, USA
12:25	Lunch & Speaker Upload Available Poster Viewing	
Session 2: Basics of MRS(I) Part II: Auxiliary Techniques		
<i>Moderators: Robert Frost, Ph.D. & Christoph Juchem, Ph.D.</i>		
14:00	<i>B0 Shimming</i>	Chathura Kumaragamage, Ph.D. Yale University School of Medicine New Haven, CT, USA
14:20	<i>Motion Correction</i>	Andre van der Kouwe, Ph.D. Massachusetts General Hospital, Harvard Medical School Charlestown, MA, USA
14:40	<i>Water & Lipid Suppression</i>	Brian Soher, Ph.D. Duke University Medical Center Durham, NC, USA
15:00	<i>Spectral Editing & 2D MRS</i>	In-Young Choi, Ph.D. University of Kansas Medical Center Kansas City, KS, USA
15:20	<i>Functional & Diffusion-Weighted MRS</i>	Silvia Mangia, Ph.D. University of Minnesota Medical School Minneapolis, MN, USA
15:40	Break & Speaker Upload Available	
Proffered Papers - Oral Session		
<i>Moderators: Bruce Jenkins Ph.D. & Antonia Susnjar Ph.D.</i>		
16:10	<i>Reduced Cortical Glutamate During Inhibitory Control with Emotional Face Stimuli in Trauma-Exposed Adolescents</i>	John France, Ph.D. Candidate Wayne State University Detroit, MI, USA
16:20	<i>Altered Brain Energy Metabolism Related to Astrocytes in Alzheimer's Disease</i>	Kosei Hirata, M.D., Ph.D. National Institutes for Quantum Science & Technology Chiba, Japan

16:30	<i>Evidence for Macromolecular Signal Contributions in the Downfield Region of 1H MR Brain Spectra Using Metabolite Cycled Diffusion-Weighted SPECIAL</i>	Jessie Mosso, Ph.D. Center for Biomedical Imaging Lausanne, Switzerland
16:40	<i>GABA & Glutamate MRS in ASD: Addressing Discrepancies in the Literature with Larger N</i>	Muhammad Saleh, Ph.D. Children's Hospital of Philadelphia Philadelphia, PA, USA
16:50	<i>Effects of Ketosis on Neural Metabolite Concentrations Measured Using Ultra-High-Field 1H MR Spectroscopy</i>	Helena van Nieuwenhuizen, M.Sc. Stony Brook University Stony Brook, NY, USA
Session 3: Preclinical MRS		
<i>Moderators: Henk de Feyter, Ph.D. & Christian Farrar, Ph.D.</i>		
17:00	<i>Experimental Techniques for Preclinical MRS</i>	Basavaraju Sanganahalli, Ph.D. Yale University School of Medicine New Haven, CT, USA
17:20	<i>Targeted Metabolomics to Understand How Environmental Nutrients Influence Cancer Metabolism & Tumor Progression</i>	Matthew van der Heiden, Ph.D. Koch Institute for Integrative Cancer Research at MIT Cambridge, MA, USA
17:40	<i>Metabolic Flux by MRS</i>	Pavithra Viswanath, Ph.D. University of California, San Francisco San Francisco, CA, USA
18:00	<i>Pharmacological MRS</i>	Corin Miller, Ph.D. Merck Research Labs West Point, PA, USA
18:20	<i>Collaborative Multi-Center Pre-Clinical MRS Study (CoMP-MRS)</i>	Cristina Cudalbu, Ph.D. Swiss Federal Institute of Technology Lausanne Lausanne, Switzerland
18:50	Adjourn	

Day 2: WEDNESDAY, 16 OCTOBER 2024 (1.75 CME Available)

07:30	Registration & Speaker Upload Available	
Session 4: Advanced MRSI (No CME Available)		
<i>Moderators: Borjan Gagoski, Ph.D. & Fan Lam, Ph.D.</i>		
08:30	<i>Spectral-Spatial Encoding</i>	Claudiu Schirda, Ph.D. University of Pittsburgh Medical Center Pittsburgh, PA, USA
08:50	<i>Undersampling Techniques</i>	Wolfgang Bogner, Ph.D. Medical University Vienna Vienna, Austria
09:10	<i>Ultra-High Field MRSI</i>	Malgorzata Marjanska, Ph.D. University of Minnesota Minneapolis, MN, USA
09:30	<i>Special Hardware for MRSI</i>	Jason Stockmann, Ph.D. Massachusetts General Hospital, Harvard Medical School Cambridge, MA, USA

09:50	<i>Deep Learning in MRSI: Towards AI-Powered Ultrafast MRSI</i>	Yudu Li, Ph.D. University of Illinois at Urbana-Champaign Urbana, IL, USA
10:10	Break & Speaker Upload Available	
	Proffered Papers - Oral Session	
	<i>Moderators: Bruce Jenkins Ph.D. & Antonia Susnjar Ph.D.</i>	
10:40	<i>Accelerated Navigator for Real-Time Motion & Shim Array Correction of Whole-Brain MR Spectroscopic Imaging</i>	Nutandev Bikkamane Jayadev, Ph.D. Siemens Medical Solution, USA Malvern, PA, USA
10:50	<i>Bridging the Gap Between Preclinical-Clinical-Metabolomics-MRI-MRS Methods via PETALUTE MRI</i>	Uzay Emir, Ph.D. University of North Carolina Chapel Hill, NC, USA
11:00	<i>MR Spectra Quality Control in Neurological Disease with Stacked Transformer Representation & Convolutional Network</i>	Jenny Lee, M.A. University of California, San Francisco San Francisco, CA, USA
11:10	<i>Reproducibility of Downfield MRSI in the Human Brain at 3T</i>	Ipek Ozdemir, Ph.D. Johns Hopkins University Baltimore, MD, USA
11:20	<i>Fast, High-Resolution, Volumetric Diffusion-Weighted MRSI of the Brain</i>	Zepeng Wang, B.Sc. University of Illinois Urbana-Champaign Urbana, Illinois, USA
11:30	<i>Keynote Address: MRS(i) State of the Art/New Horizons</i>	Xin Yu, D.Sc. Case Western Reserve University Cleveland, OH, USA
12:10	Power Pitches	
Poster No. 13	<i>Assessment of Tissue-Specific Relaxation Times of Deuterium Labeled Resonances in the Human Brain Using Dynamic Inversion Recovery & Hahn Spin-Echo Acquisitions with Fast Concentric Ring Trajectory Sampling at 7T</i>	Viola Bader, M.Sc. Medical University of Vienna Vienna, Austria
Poster No. 23	<i>A Manifold Learning-Based Approach to Denoising for Deuterium Metabolic Imaging</i>	Didi Chi, Ph.D. Yale University New Haven, CT, USA
Poster No. 68	<i>Design & Evaluation of a BrainPET Insert for UHF_MR Systems & Metabolic Marker Imaging Exploiting OEF Measures</i>	N. Jon Shah, Ph.D. Institute of Neuroscience & Medicine, Forschungszentrum Juelich GmbH Juelich, Germany
Poster No. 80	<i>Characterization of NAD+ & Tryptophan Cross-Relaxation in the Human Brain at 7T</i>	Sophia Swago, B.Sc. University of Pennsylvania Philadelphia, PA, USA
Poster No. 84	<i>Deep-ERv2: Metabolically Trained Deep Learning Reconstruction of Whole-Brain Non-Cartesian Compressed-Sensing MR Spectroscopic Imaging</i>	Paul Weiser, M.Sc. Massachusetts General Hospital Cambridge, MA, USA
Poster No. 87	<i>Whole Cerebrum Quantitative Metabolite Mapping of the Human Brain at 9.4 T</i>	Andrew M. Wright, M.Sc. University of Texas Southwestern Medical Center Dallas, TX, USA

12:25	Lunch & Speaker Upload Available Poster Viewing (No CME Available)	
Session 5: X-Nuclei & Hyperpolarized MRS/MRSI4 (1.75 CME Available)		
<i>Moderators: Jerome Ackerman, Ph.D. & Yi-Fen Yen, Ph.D.</i>		
14:00	<i>31P MRS/MRSI</i>	Jeanine Prompers, Ph.D. University Medical Center Utrecht Utrecht, The Netherlands
14:20	<i>Deuterium Metabolic Imaging</i>	Fabian Niess, Ph.D. Medical University Vienna Vienna, Austria
14:40	<i>13C MRS/MRSI</i>	Anke Henning, Ph.D. University of Texas South Western Dallas, TX, USA
15:00	<i>Hyperpolarized 13C Imaging</i>	Kayvan Keshari, Ph.D. Memorial Sloan-Kettering Cancer Center New York, NY, USA
15:20	<i>A World Of Weird: NMR & MRI at 6.5 mT</i>	Matthew Rosen, Ph.D. Athinoula A. Martinos Center for Biomedical Imaging Charlestown, MA, USA
15:40	Break & Speaker Upload Available	
Proffered Papers - Oral Session		
<i>Moderators: Didi Chi Ph.D. & Bernhard Strasser Ph.D.</i>		
16:10	<i>Towards High Resolution 3D Deuterium Metabolic Imaging of the Human Brain Using Balanced Steady State Free Precession & Concentric Ring Trajectory Readout (bSSFP-CRT) at 7T</i>	Sabina Frese, M.Sc. Medical University of Vienna Vienna, Austria
16:20	<i>Dynamic 3D Deuterium Metabolic Imaging in the Stomach, Portal Vein, & Liver at 7T</i>	Maaïke Konig, M.Sc. UMC Utrecht Utrecht, The Netherlands
16:30	<i>Co-Polarized HP [1-13C]pyruvate & [1-13C]dehydroascorbate Reveals Compartmentalized Brain Metabolism</i>	Paolo Porcari, Ph.D. Memorial Sloan Kettering Cancer Center New York, NY, USA
16:40	<i>Creatine Kinase Imaging (CKI) for In-Vivo 3D Mapping of Creatine Kinase Kinetics with 31P Magnetization Transfer MRF</i>	Mark Stephan Widmaier, M.Sc. Swiss Federal Institute of Technology Lausanne Lausanne, Switzerland
16:50	<i>A High Spatiotemporal Resolution Method for 2H Metabolic Imaging Based on Dynamic Undersampling bSSFP Chemical Shift Imaging & Multi-Scale Low Rank Reconstruction</i>	Jinrui Zhao, B.Sc. Huazhong University of Science & Technology Wuhan, China
Industry/Sponsor Presentations (No CME Available)		
<i>Moderators: Ovidiu C. Andronesi, M.D., Ph.D. & Chao Ma, Ph.D.</i>		
17:00	<i>Doing R&D Together</i>	Ralph Noeske, Ph.D. GE HealthCare
17:20	<i>Tesla Dynamic Coils, New Partner in RF Technology</i>	Jiying Dai, M.Sc. Tesla Dynamic Coils

17:40	<i>United Imaging MR Technologies</i>	Abram Voorhees, Ph.D. United Imaging
17:55	<i>Versatile, High-Throughput Metabolic Imaging with d-DNP</i>	James Kempf Bruker
18:05	<i>New Horizons in Hyperpolarized Metabolic MRI</i>	Sella Brosh, M.D. NVision Imaging Technologies GmbH
18:15	Adjourn	
18:30	Networking Reception	

Day 3: THURSDAY, 17 OCTOBER 2024 (1.50 CME Available)

07:30	Registration & Speaker Upload Available	
Session 6: Clinical Applications of MRS		
<i>Moderators: Otto Rapalino, Ph.D. & Eva Ratai, Ph.D.</i>		
08:30	<i>Clinical Applications of MRS/MRSI of Cancer</i>	Esin Ozturk-Isik, Ph.D. Bogaziçi University Istanbul, Turkey
08:50	<i>MRS in Neuropsychiatric Diseases</i>	Dost Ongur, M.D. McLean Hospital, Harvard University Belmont, MA, USA
09:10	<i>MRS in Metabolic & Neurodegenerative Diseases</i>	Gulin Oz, Ph.D. University of Minnesota Minneapolis, MN, USA
09:30	<i>MRS of the Body: Liver, Cardiac, Muscle, etc.</i>	Ladislav Valkovic, Ph.D. University of Oxford Oxford, England, UK
09:50	<i>Clinical Integration of 3D Spectroscopic MRI in Radiation Therapy</i>	Hyunsuk Shim, Ph.D. Emory University Atlanta, GA, USA
10:10	Break & Speaker Upload Available	
Proffered Papers - Oral Session		
<i>Moderators: Gerald Hefferman M.D. & Gulnur Semahat Ungan, Ph.D.</i>		
10:40	<i>Simultaneous Brain [11C]PBR28 Positron Emission Tomography & 1H-MRS Imaging of Inflammation in People with HIV & HIV-Related Neuropathic Pain</i>	Keenan Byrne, B.Sc. Massachusetts General Hospital Boston, MA, USA
10:50	<i>Global Metabolic & Ionic Changes in Mild Traumatic Brain Injury May Not Share a Common Pathophysiological Origin: A Combined 1H MRSI & 23Na MRI Study</i>	Anna Chen, M. Phil New York University Langone Health New York, NY, USA
11:00	<i>Analysis of 31P Chemical-Shift Signatures of High-Energy Phosphates in Glioma Patients Measured at 7T</i>	Vanessa L. Franke, Dr. rer. nat German Cancer Center Heidelberg, Germany
11:10	<i>Parallel 1H MRSI & DMI in Patients with a Brain Tumor</i>	Yanning Liu, Ph.D. Yale University New Haven, CT, USA
11:20	<i>The Potential Utility of Spectroscopic MRI & Belinostat for Radiotherapy Guidance in Newly Diagnosed Glioblastoma</i>	Abinand Rejimon, B.Sc. Emory University School of Medicine Atlanta, GA, USA

11:30	<i>Keynote Address: Molecular Imaging: Breaking Barriers</i>	Shadi Abdar Esfahani, M.D., M.P.H. Massachusetts General Hospital Boston, MA, USA
12:10	Power Pitches	
Poster No. 62	<i>Longitudinal Analysis of Spectroscopic MRI-Guided Proton Therapy in Pediatric High-Grade Glioma</i>	Abinand Rejimon, B.Sc. Emory University School of Medicine Atlanta, GA, USA
Poster No. 66	<i>Study of Neurometabolic Alterations in Tuberous Sclerosis Complex Using Multi-Slice MRSI at 3T</i>	Dillip K. Senapati, Ph.D. Johns Hopkins University Baltimore, MD, USA
Poster No. 69	<i>A Clinical Trial of 3D Whole Brain Spectroscopic MRI To Guide Proton Radiation Therapy in Recurrent Glioblastoma: Results in the First Ten Patients</i>	Sulaiman Sheriff, B.Sc. University of Miami Miami, FL, USA
Poster No. 75	<i>Myo-Inositol Levels in the Dorsal Anterior Cingulate Cortex Predict Anxiety-To-Eat in Anorexia Nervosa</i>	Yulu Song, M.D. Johns Hopkins University Baltimore, MD, USA
Poster No. 82	<i>Differentiating mIDH Astrocytomas & Oligodendrogliomas Using Unsupervised Analysis of 3D MRSI</i>	Gulnar Semahat Ungan, Ph.D. Athinoula A. Martinos Center for Biomedical Imaging Boston, MA, USA
Poster No. 85	<i>Increased GABA in Cingulate Cortex After One Night of Total Sleep Deprivation</i>	Stephanie Williams, B.Sc. Massachusetts Institute of Technology Cambridge, MA, USA
12:25	Lunch & Speaker Upload Available Poster Viewing (No CME Available)	
Session 7: Molecular Imaging (No CME Available)		
<i>Moderators: Susie Huang, M.D., Ph.D. & Yan Li, Ph.D.</i>		
14:00	<i>Chemical Exchange Saturation Transfer</i>	Daniel Paech, M.D., Ph.D. Mass General Brigham Boston, MA, USA
14:20	<i>Positron Emission Tomography</i>	Ciprian Catana, M.D., Ph.D. Massachusetts General Hospital, Harvard Medical School Charlestown, MA, USA
14:40	<i>Multi-Functional Molecular Imaging Through Hyperspectral Single Photon Spectroscopy</i>	Ling-Jian Meng, Ph.D. University of Illinois at Urbana- Champaign Urbana, IL, USA
15:00	<i>Near Infrared Spectroscopy</i>	Stefan Carp, Ph.D. Massachusetts General Hospital Charlestown, MA, USA
15:20	<i>Fluorescence Lifetime-Based Optical Molecular Imaging</i>	Anand Kumar, Ph.D. Massachusetts Eye & Ear Boston, MA, USA
15:40	Break & Speaker Upload Available	
16:10	<i>Special Guest: Next Generation MRI & Unmet Clinical Needs</i>	Lawrence Wald, Ph.D. A.A. Martinos Center, Massachusetts General Hospital Charlestown, MA, USA

16:50	Awards (No CME Available)
17:20	Shark-Tank Session (No CME Available)
Moderators: Bastien Guerin Ph.D., Ralph Noeske Ph.D., Matthew Rosen Ph.D., Anthony Samir MBBCH. & Abram Voorhees Ph.D.	
18:00	Tour of the Martinos Center (No CME Available)
18:30	Adjourn

Day 4: FRIDAY, 18 OCTOBER 2024 (No CME Available)

07:30	Registration & Speaker Upload Available	
Session 8: Metabolomics		
Moderators: Candace Fleischer, Ph.D. & Mioara Larion, Ph.D.		
8:30	NMR Spectroscopy of Tissue Extracts	Robin de Graaf, Ph.D. Yale University School of Medicine New Haven, CT, USA
8:50	High-Resolution Magic Angle Spinning (HR-MAS)	Jamie Near, Ph.D. University of Toronto Toronto, ON, Canada
9:10	Machine-Learning Powering the Quantitative, Automated Deconvolution & Quantitation of 1D & 2D NMR Spectra of Complex Mixtures at Arbitrary Magnetic Fields	Rafael Brüsweiler, Ph.D. Ohio State University Columbus, OH, USA
9:30	Mass Spectrometry & In Vivo Microdialysis	Lingjun Li, University of Wisconsin-Madison Madison, WI, USA
9:50	Multimodal Imaging Platform for Drug Development	Nathalie Agar, Ph.D. Brigham & Women's Hospital Boston, MA, USA
10:10	Infrared & Raman Spectroscopy	Lingyan Shi, Ph.D. University of California, San Diego San Diego, CA, USA
10:30	Break & Speaker Upload Available	
11:00	Code & Data Sharing Committee (No CME Available)	Antonia Kaiser, Ph.D. & Dennis van de Sande, M.Sc.
11:30	MRS Challenge	
12:00	Conclusions	
12:30	Boxed Lunch & Adjourn	

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Anna Chen, M. Phil.

Rena Kono, Ph.D.

Sneha Vaishali Senthil, M.Sc.

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John LaMaster, M.Sc.

Jun-Wei Xu, M.Sc.

Vanessa L. Franke, Dr. rer. nat

Jessie Mosso, Ph.D.

Julia Zickus, B.Sc.

Posters

Tuesday, 15 October 2024

POSTER	TITLE	AUTHOR
25	<i>Data-Driven Determination of Optimal Basis Set Composition Using Group-Based Model Selection</i>	Christopher Davies-Jenkins, Ph.D. Johns Hopkins University Baltimore, MD, USA
43	<i>Functional Magnetic Resonance Spectroscopy at 7 Tesla: Examining Processing Speed & Glutamate Dynamics in Cognitive Function</i>	Antonia Kaiser, Ph.D. Centre d'Imagerie Biomedicale Lausanne, Switzerland
71	<i>A Water Relaxation Atlas for Age- & Region-Specific Metabolite Concentration Correction</i>	Gizeaddis Simegn, Ph.D. Johns Hopkins University Baltimore, MD, USA
86	<i>Measurement of T1 & T2 Relaxation Time Constants of NAD+ & NR/NMN in Skeletal Muscle at 7T</i>	Neil Wilson, Ph.D. University of Pennsylvania Philadelphia, PA, USA
85	<i>Increased GABA in Cingulate Cortex After One Night of Total Sleep Deprivation</i>	Stephanie Williams, B.A. Massachusetts Institute of Technology Cambridge, MA, USA
19	<i>Contributions of Visual Cortex Metabolism to Visual Field Loss Patterns in Glaucoma Using Archetypal & Information Gain Analyses</i>	Kevin Chan, Ph.D. New York University Grossman School of Medicine New York, NY, USA
72	<i>2D Linear-Combination Modeling for Frequency-&-Phase Correction of In Vivo MRS Data</i>	Dunja Simicic, Ph.D. Johns Hopkins University School of Medicine Baltimore, MD, USA
16	<i>Noise Decorrelation Results in Optimal SNR for GABA-Edited MRS Data: A Comparison of RF Coil Combination Methods</i>	Amy Bouchard, Ph.D. Weill Cornell Medicine New York, NY, USA
28	<i>Evidence of Differential Glutamate Modulation During Inhibitory Motor Control in the dACC Among Healthy Adults Utilizing 1H fMRS with a Novel Interleaved Control Condition</i>	Jillian Eichstaedt, B.Sc. Wayne State University School of Medicine Detroit, MI, USA
47	<i>Vendor Neutral Magnetic Resonance Spectroscopy</i>	Simon Konstandin, Ph.D. Fraunhofer Institute for Digital Medicine MEVIS Bremen, Germany
91	<i>Optimization of Brain Glucose & Lactate Measurement Using Ultrashort-TE STEAM at 7T: Feasibility & Preliminary Results</i>	Ying Xiao, M.Sc. Centre d'Imagerie Biomedicale, École Polytechnique Fédérale de Lausanne Lausanne, Switzerland
3	<i>In Vivo Detection of GSH & GABA in Glioblastoma Using MEGA-sLASER Spectral Editing at 3 T</i>	Seyma Alcicek, Ph.D. University Hospital Frankfurt, Goethe University Frankfurt, Germany
8	<i>Assessment of LR-TGV Reconstruction on Preclinical Compressed Sensing 1H-FID-MRSI at 14.1T</i>	Brayan Alves, M.Sc. CIBM Lausanne, Switzerland
20	<i>Echo Time Optimization of 2HG-Edited MRS at 3T</i>	Kimberly Chan, Ph.D. University of Texas Southwestern Dallas, TX, USA
52	<i>Increased SNR of InVivo MR Spectra Acquired at 7T Using OpTIMUS Coil Combination</i>	Eva Martinez Luque, B.Sc. Emory University & Georgia Institute of Technology Atlanta, GA, USA
57	<i>Comparison of Human Brain Downfield MRSI at 3 & 7 Tesla</i>	Ipek Ozdemir, Ph.D. Johns Hopkins University Baltimore, MD, USA

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POSTER	TITLE	AUTHOR
59	<i>An Accelerated Multiparametric Protocol for Molecular MRI at 9.4 Tesla</i>	Justyna Platek, M.Sc. German Cancer Research Center Heidelberg, Germany
65	<i>Metabolite Cycled Semi-LASER Localization for MR Spectroscopy of the Human Skeletal Muscle</i>	Manoj Kumar Sarma, Ph.D. University of Texas Southwestern Dallas, TX, USA
10	<i>Isolation of Homocarnosine C2-Proton at 7T in Healthy Volunteers</i>	Ryan Armbruster, B.Sc. University of Pennsylvania Philadelphia, PA, USA
34	<i>Improved Spectral Fitting & Repeatability of Glutamine Quantification in the Human Brain at 7T</i>	Rachel Goldberg, Diploma Emory University Atlanta, GA, USA
30	<i>Background Handling with New Automated jMRUI Quest-MM NLLS Algorithm: In Silico & a Circulatory Arrest Study Using Neonatal Pigs</i>	Polina Emeliyanova, Ph.D. Candidate University of Manchester Manchester, England, USA
49	<i>Highly Accurate Monitoring of Temperature Profiles by 1H MRS: A Novel Line Shape Deconvolution Type Compatible with the Temperature Dependence of Water Proton T2</i>	Norbert Lutz, Ph.D Aix-Marseille University Marseille, France
61	<i>Normative Tract Profiles of White Matter Microstructure & Metabolite Ratios Along the Superior Longitudinal Fasciculus in Healthy Human Brain</i>	Archith Rajan, Ph.D. University of Pennsylvania Philadelphia, PA, USA
64	<i>An Updated Spectral Fitting Strategy for Magnetic Resonance Spectroscopic Imaging</i>	Yeison Rodriguez, Ph.D. University of Texas Southwestern Medical Center Dallas, TX, USA
74	<i>FID Backward Linear Prediction with Two Autoregressive Algorithms for Full Compensation of Acquisition Delays</i>	Alessio Siviglia, M.Sc. Centre d'Imagerie Biomedicale Lausanne, Switzerland
21	<i>ProFit-1D for Quantifying J-Difference Edited Data at 3T</i>	Kimberly Chan, Ph.D. University of Texas Southwestern Dallas, TX, USA
44	<i>A Pre-Registered Report on the Assessment of Myelination in the Cingulum Bundle & Levels of Myo-Inositol & N-Acetyl Aspartate by Magnetic Resonance Spectroscopy Imaging (MRSI) in Adulthood & Late Life</i>	Ella Kelly, Diploma Hendrix College Conway, AK, USA
50	<i>Quantifying Intravoxel Heterogeneity with qhMRS: Multiparametric Line Shape Evaluation of MRS Resonances with Chemical Shifts Sensitive to Physicochemical Tissue Parameters</i>	Norbert Lutz, Ph.D Aix-Marseille University Marseille, France
55	<i>Evaluating the Impact of Manganese on Brain Metabolite Relaxation & Quantification Using Magnetic Resonance Spectroscopy</i>	Gianna Nossa, D.Phil. Purdue University West Lafayette, IN, USA
53	<i>MRS Post-Processing for Metabolites with Low Concentrations</i>	Dale Mugler, Ph.D. Medical University of South Carolina Columbia, SC, USA
39	<i>In Vivo Detection of Metabolites in Human Skeletal Muscle Using 1H-MRS at 7T</i>	Maya Hioki, Ph.D. Teikyo Heisei University Chiba, Japan
73	<i>NMRbox: A Unified Platform for Reproducible & High Performance Computation</i>	Bernd Simon, Ph.D. UConn Health Farmington, CT, USA
92	<i>MRspecLab-A Graphical Pipeline Environment for MRS/MRSI Data Processing & Analysis</i>	Ying Xiao, M.Sc. Swiss Federal Institute of Technology Lausanne Lausanne, Switzerland

Posters

Wednesday, 16 October 2024

POSTER	TITLE	AUTHOR
13	<i>Assessment of Tissue-Specific Relaxation Times of Deuterium Labeled Resonances in the Human Brain Using Dynamic Inversion Recovery & Hahn Spin-Echo Acquisitions with Fast Concentric Ring Trajectory Sampling at 7T</i>	Viola Bader, M.Sc. Medical University of Vienna Vienna, Austria
84	<i>Deep-ERv2: Metabolically Trained Deep Learning Reconstruction of Whole-Brain Non-Cartesian Compressed-Sensing MR Spectroscopic Imaging</i>	Paul Weiser, M.Sc. Massachusetts General Hospital Cambridge, MA, USA
80	<i>Characterization of NAD+ & Tryptophan Cross-Relaxation in the Human Brain at 7T</i>	Sophia Swago, B.Sc. University of Pennsylvania Philadelphia, PA, USA
68	<i>Design & Evaluation of a BrainPET Insert for UHF_MR Systems & Metabolic Marker Imaging Exploiting OEF Measures</i>	N. Jon Shah, Ph.D. University of Neuroscience & Medicine Juelich, Germany
87	<i>Whole Cerebrum Quantitative Metabolite Mapping of the Human Brain at 9.4T</i>	Andrew M. Wright, M.Sc. UT Southwestern Medical Center Dallas, TX, USA
23	<i>A Manifold Learning-Based Approach to Denoising for Deuterium Metabolic Imaging</i>	Didi Chi, Ph.D. Yale University New Haven, CT, USA
14	<i>Effects of Stress & CD5L Levels on Brain Metabolite Levels in Mice</i>	Colleen Bailey, Ph.D. Sunnybrook Research Institute Toronto, ON, Canada
31	Withdrawn	
78	<i>FID-MRSI at 7T in the Human Brain Using Density-Weighted Rosette Trajectories</i>	Bernhard Strasser, Ph.D. Medical University of Vienna Vienna, Austria
97	<i>Effects of Water-Based Estimation of Gaussian Line Broadening on Accuracy, Precision & Speed of MRSI Linear-Combination Modeling (LCM)</i>	Helge Zöllner, Ph.D. Johns Hopkins University School of Medicine Baltimore, MD, USA
1	<i>Stability of Glutamate & GABA Quantification Using Concurrent fMRI-fMRS at 7T</i>	Shahrokh Abbasi-Rad, Ph.D. Massachusetts General Hospital Charlestown, MA, USA
11	<i>In Vivo Brain Lac+ Flux Measured in the Healthy Human Brain After Intense Exercise at 3T</i>	Ryan Armbruster, B.Sc. University of Pennsylvania Philadelphia, PA, USA
29	<i>Weight Loss Predicts the Modulation of dACC Glutamate During Inhibitory Control with the Influence of Food-Cues: Evidence from 1H fMRS</i>	Jillian Eichstaedt, B.Sc. Wayne State University School of Medicine Detroit, MI, USA
7	<i>Diffusion Models Based Super-Resolution MR Spectroscopic Imaging for Mapping Tumor Metabolism</i>	Mohammed Alsubaie, M.Sc. Florida Institute of Technology Melbourne, FL, USA
18	<i>In Vivo Whole-Slice Spin-Echo Rosette MR-Spectroscopic Imaging (MRSI) for Human Brain Metabolic Mapping at 3T</i>	Lubna Burki, M.Sc. University of Toronto Toronto, ON, Canada
4	<i>MR Spectroscopic Imaging for Glioma-Associated Epilepsy</i>	Seyma Alcicek, Ph.D. University Hospital Frankfurt, Goethe University Frankfurt, Germany
38	<i>3D-Density-Weighting for Concentric Ring Trajectories: An Analytical Solution</i>	Lukas Hingerl, Ph. D. Medical University of Vienna Vienna, Austria

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9	<i>An End-to-End Guide for Simulating an MRS Metabolite Basis Set</i>	Jessica Archibald, Ph.D. Weill Cornell Medicine New York, NY, USA
60	<i>On Multi-Region Shimming in High-Speed MR Spectroscopic Imaging</i>	Stefan Posse, Ph.D. University of New Mexico Albuquerque, NM, USA
83	<i>Deep-Learning-Based Spectral Noise Reduction with Synthetic Data for 7T Proton MRSI</i>	Tianyu Wang, M.Sc. University of Texas Southwestern Medical Center Dallas, TX, USA
93	<i>Exploring the Impact of Loss Functions on k-Space Reconstruction for MRSI Data Using Complex Convolution Networks</i>	Jun-Wei Xu, M.Sc. National Sun Yat-Sen University Kaohsiung, Taiwan
40	<i>Rosette Spectroscopic Imaging for Whole-Brain Metabolite Mapping at 7T: Acceleration Potential & Reproducibility</i>	Zhiwei Huang, M.Sc. École Polytechnique Fédérale de Lausanne Lausanne, Switzerland
42	<i>Spectral Quality Enhancement of Lower Brain 1H MRSI at 7T by Localized B0 Shimming Tool</i>	Mahrshi Jani, M.Sc. University of Texas Southwestern Medical Center Dallas, TX, USA
63	<i>Towards the Suppression of Lipid Contamination in Whole Brain Slice Magnetic Resonance Spectroscopic Imaging Using Two-Dimensional Selective Excitation</i>	Jason Rock, B.Sc. University of Toronto Toronto, ON, Canada
76	<i>(Metabolic Activity Diffusion Imaging) MADI Informs In Vivo MRS Interpretation: Tissue Cell Density</i>	Charles Springer, Ph.D. Oregon Health & Science University Portland, OR, USA
48	<i>Synthetic 2HG-Targeted MR Spectroscopy for Optimising Quality Control Measures & Data Analysis in Clinic</i>	Michael Langsen, M.Sc. University of Edinburgh Edinburgh, Scotland, UK
5	Withdrawn	
6	Withdrawn	
54	<i>ADC Assessment as a Function of the B Value Parameter in a Diffusion Weighted Imaging Context, As Applied to Human Brain Imaging</i>	Ruben Nechifor, Ph.D. Babes-Bolyai University Cluj, Romania
88	<i>Q-MRS: A Deep Learning Framework for Quantitative Magnetic Resonance Spectra Analysis</i>	Christopher Wu, M.Sc. Columbia University New York, NY, USA
12	<i>Comparison of Compartment-Based Reconstruction Techniques for the Measurement of Creatine-Kinase (CK) Reaction Rates in the Human Heart Using 31P-MPR at 3T</i>	Aaron Axford, M.Bc., B.Sc. & Ph.D. University of Oxford Oxford, England, UK
70	<i>Healthy Brain Metabolite Map Under Acute Hypoxia</i>	Xianfeng Shi Ph.D. University of Utah Salt Lake, UT, USA
17	<i>Comparison of MRI/MRS Hepatic Fat Fraction Quantification Methods</i>	Marissa Brown, B.Sc. The University of Texas Health Science Center at Houston Houston, TX, USA

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82	<i>Differentiating mIDH Astrocytomas & Oligodendrogliomas Using Unsupervised Analysis of 3D MRSI</i>	Gulnur Semahat Ungan, Ph.D. Athinoula A. Martinos Center for Biomedical Imaging Boston, MA, USA
66	<i>Study of Neurometabolic Alterations in Tuberous Sclerosis Complex Using Multi-Slice MRSI at 3T</i>	Dillip K. Senapati, Ph.D. Johns Hopkins University Baltimore, MD, USA
69	<i>A Clinical Trial of 3D Whole Brain Spectroscopic MRI To Guide Proton Radiation Therapy in Recurrent Glioblastoma: Results in the First Ten Patients</i>	Sulaiman Sheriff, B.Sc. University of Miami Miami, FL, USA
45	<i>A Metabolic Index for Whole-Brain Imaging of Mutant IDH Metabolism in Glioma Patients</i>	Sanghoon Kim, M.D. Massachusetts General Hospital Boston, MA, USA
32	<i>What Do Metabolite Changes in the Cerebellum of Welders Exposed to Manganese Tell Us About Their Motor Changes Using Edited MRS</i>	Jessica George, M.Sc. Purdue University West Lafayette, IN, USA
51	<i>Declining Myo-Inositol in MS Patients Treated with Ocrelizumab Over 2 Years</i>	Erin MacMillan, Ph.D. University of British Columbia Vancouver, BC, Canada
81	<i>Spectroscopic MRI Biomarkers Predict Survival in A Glioblastoma Clinical Trial</i>	Anuradha Trivedi, B.Sc. Emory University Atlanta, GA, USA
96	<i>Increased ml/tNAA in Normal-Appearing WM & Glu/tCr in Cortical GM of RRMS Patients Over Two Years: 7T Ultra-High-Resolution MRSI Follow-Up Study</i>	Anna Zöchner, M.Sc. Medical University of Vienna Vienna, Austria
2	<i>Altered Amino Acid Metabolism in Glioma: In Vivo MR-Spectroscopic Detection of Alanine as a Potential Biomarker of Poor Survival in Glioma Patients</i>	Seyma Alcicek, Ph.D. University Hospital Frankfurt, Goethe University Frankfurt, Germany
36	<i>Effect of Physical Exertion on Central Nervous System Oxidative Stress & Glycolytic Metabolism in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)</i>	Nicholas Hampilos, M.D. Weill Cornell Medicine New York, NY, USA
56	<i>Oral Administration of Deuterated Choline as a New Approach to Provide High Tumor-to-Brain Image Contrast in Deuterium Metabolic Imaging (DMI)</i>	Victor Osoliniec, B.Sc. Yale University New Haven, CT, USA
94	<i>Molecular Mechanisms Underlying Abnormal Brain Networks in Psychotic Disorders</i>	Shuqin Zhou, Ph.D. McLean Hospital Belmont, MA, USA
95	<i>Interrogating Aging Progression & Early Detection of Alzheimer's Disease Using Metabolic Imaging</i>	Julia Zickus, B.Sc. University of Texas MD Anderson Cancer Center Houston, TX, USA

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67	<i>Assessment of Region-Specific Oxidative Stress in Relapsing Remitting Multiple Sclerosis</i>	Sneha Vaishali Senthil, M.Sc. McGill University Montreal, QC, Canada
77	<i>Evidence of Impaired dACC Glutamate Modulation Under Task-Specific Motor Control in Obsessive Compulsive Disorder Using 1H fMRS</i>	Jeffrey Stanley, Ph.D. Wayne State University School of Medicine Detroit, MI, USA
79	<i>Characterization of GABA Quantification at 3T MRI for Study in People with HIV</i>	Bragi Sveinsson, Ph.D. Massachusetts General Hospital Boston, MA, USA
89	<i>Optimizing IDH Mutation Diagnostic Efficiency in Gliomas with Combined Metabolites Using 1H MRS</i>	Yao Xiao, M.Sc. Wuhan Union Hospital Wuhan, China
90	<i>Optimizing Preprocessing Pipelines for 2-Hydroxyglutarate Detection in IDH-Mutant Gliomas with Long-TE 1H MRS</i>	Yao Xiao, M.Sc. Wuhan Union Hospital Wuhan, China
33	<i>Age Is Associated with Myo-Inositol in Survivors of Pediatric Hodgkin Lymphoma (HL)</i>	Kyla Gibney, Ph.D. St. Jude Children's Research Hospital Memphis, TN, USA
37	<i>Exploring the Effects of Phospholipase A2 Inhibition on Brain Metabolism & Pathology in a Rat Model of Alzheimer's Disease</i>	Emily Hiles, B.Sc. University of Toronto Toronto, ON, Canada
58	<i>Associations Between Brain Metabolites & Tissue Microstructure in Children: A Multimodal Imaging Study</i>	Meaghan Perdue, Ph.D. University of Calgary Calgary, AB, Canada
35	<i>Addressing the Understudied via MRS: Repetitive Neurotrauma in Women Survivors of Intimate Partner Violence</i>	Atila Gonenc, Ph.D. Massachusetts General Hospital Boston, Massachusetts
15	<i>Evaluation of Repeated Magnetic Resonance Spectroscopy Data Acquired In Vivo Using a Hybrid PET/MRI Scanner Compared to a Standalone MRI Scanner</i>	Aditya Bhattacharya, Diploma Georgia Institute of Technology Atlanta, Georgia, USA
24	<i>The Effects of Fetal Cannabis Exposure on Neurometabolic Profile of the Amygdala</i>	Ophelia Dalkiriadis, M.D. Université de Montréal Montreal, QC, Canada
27	<i>Hyperpolarized [1-13C] Pyruvate & [2-13C] Pyruvate for Differentiating Hepatocellular Carcinoma Subtypes</i>	Qiahui Dou, M.D., Ph.D. Massachusetts General Hospital Boston, MA, USA
41	<i>Dorsal Anterior Cingulate Cortex Glutamate Concentrations & its Association with Social Difficulties in Youth with Autism Spectrum Disorder Compared to Early-Onset Psychosis</i>	Rhideeta Jalal, M.A. Loma Linda University Loma Linda, CA, USA
26	<i>Hyperpolarized [1-13C] Pyruvate MRSI Reveals Alterations in Cardiac Metabolism in a Preclinical Model of Heart Failure with Preserved Ejection Fraction</i>	Karen Dos Santos, Ph.D. Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Harvard Medical School Charlestown, MA, USA

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