

Scientific Programme

Wednesday, 1st September

IPEM MRSIG / BC-ISMRM Joint Workshop: “It’s a risky business: the use of off-label and non CE marked software and hardware in the research and clinical setting”

- 11.00 – 11.05 **Dr Dan Wilson**
Leeds Teaching Hospitals NHS Trust
Introductory remarks
- 11.05 – 11.25 **Mr David Grainger**
MHRA
“MHRA perspective on the use of non CE marked / off-label devices in the clinical and research setting”
- 11.25 – 11.45 **Dr Donald McRobbie**
Charing Cross Hospital, London
“Use of off-label software in the clinical setting”
- 11.45 – 12.05 **Dr Philip Cosgriff**
United Lincolnshire Hospitals NHS Trust
“Production and distribution of in-house software – a nuclear medicine viewpoint”
- 12.05 – 12.50 MR Manufacturers’ Viewpoint
Siemens: Dr Craig Buckley
Philips: Dr Matthew Clemence
GE: Dr Derek Shaw
- 12.50 – 13.00 Discussion Session
- 13.00 Lunch in A42

Workshop: Hyperpolarisation Strategies and ^{13}C spectroscopy

- 13:30 - 14:15 **Dr Jun Shen**
National Institute of Mental Health, Bethesda, USA
“Energetics, neurotransmission and enzyme reactions by in vivo ^{13}C MRS”
- 14:15 - 15:00 **Professor Kevin Brindle**
University of Cambridge, UK
“Detecting tumour responses to treatment with hyperpolarized ^{13}C MRSI”
- 15:00 – 15:20 Coffee break
- 15:20 - 16:05 **Professor Thomas Meersmann**
University of Nottingham, UK
“Krypton Hyperpolarization”
- 16:05 - 16:50 **Dr Jim Wild**
University of Sheffield, UK
“Hyperpolarised ^3He and ^{129}Xe MRI Methods”
- 17:00 7T tour - Please book at registration desk.
- 18:30 **Opening Drinks Reception** at University Staff Club
sponsored by
-  *Now a part of*  **Agilent Technologies**
VARIAN
- Music played by Andre Antunes (guitar) and Yana Lin (traditional Chinese instrument)
- 20:00 Dinner in Hugh Stewart hall of residence (Prior booking required)
- 21:00 – 24:00 Bar open in Hugh Stewart hall of residence

Thursday, 2nd September

08:00 – 09:00 Registration for BC-ISMRM
09:00 – 09:15 Opening by Professor Chris Rudd, Pro-Vice-Chancellor for Knowledge Transfer at the University of Nottingham

Morning Oral session 1: Multi-Nuclear and Spectroscopy

Session chairs: Penny Hubbard (University of Manchester) and Peter Morris (University of Nottingham)

- 09:15 – 09:55 **Bill Moore Lecture: Professor David Gadian**
Institute of Child Health, UCL
“MR Spectroscopy - A View from Midfield”
- 09.55 O1 “In vivo assessment of metabolism in the hypertensive rat heart using hyperpolarized 1-13C and 2-13C pyruvate”
M.S. Dodd^{1,2}, D.Ball¹, H. J. Atherton¹, M.A. Schroeder¹, L. Le Page, H.Ashrafian², H.Watkins², G.K. Radda¹, K. Clarke¹, D. J. Tyler
¹Cardiac Metabolism Research Group, ²Cardiovascular Medicine, University of Oxford, Oxford, UK
- 10.05 O2 “Hyperpolarized pyruvate and fumarate may detect early response to the anti-angiogenic drug Bevacizumab”
S.E. Bohndiek, M. I. Kettunen, D. Hu, K. M. Brindle
Department of Biochemistry, University of Cambridge and Cancer Research UK Cambridge Research Institute
- 10.15 O3 “Two-dimensional amide proton spectroscopy using exchange-modulated PRESS (EXPRESS)”
S. Walker-Samuel¹, M.F. Lythgoe¹, Xavier Golay²
¹UCL Centre for Advanced Biomedical Imaging, London, UK ²Institute of Neurology, UCL, London, UK
- 10.25 O4 “Novel MRI detection of the ischaemic penumbra: direct assessment of metabolic integrity”
W.M. Holmes¹, M.R. Lopez-Gonzalez², L. Gallagher¹, G.A. Deuchar¹, I.M.Macrae¹, C. Santosh³
¹ Glasgow Experimental MRI Centre, University of Glasgow. ²Department of Clinical Physics, SINAPSE, University of Glasgow ³ Institute of Neurological Sciences, Southern General Hospital, Glasgow
- 10.35 O5 “3D ventilation imaging of hyperpolarised 3He combined with MR measurement of inert gas washout”
M.H. Deppe¹, J. Parra-Robles¹, S. Ajraoui¹, J.M. Wild¹
¹Academic Unit of Radiology, University of Sheffield, Sheffield, UK
- 10:45 – 11:05 Coffee break

Morning Oral session 2: fMRI Methods and Applications

Session chairs: David Atkinson (University College London) and Sue Francis (University of Nottingham)

- 11:05 – 11.35 **Invited Speaker: Professor Steve Smith,**
fMRIB, University of Oxford
“Brain networks from resting and activation data: Methods and results”
- 11.35 O6 *“The first simultaneous intracranial EEG and fMRI recordings in the active human sensorimotor cortex show fMRI is strongly correlated with high gamma frequency power.”*
D. W. Carmichael¹, S. Vulliemoz^{1,2}, R. Rodionov¹, K. Rosenkranz¹, M.C. Walker¹, J. Thornton³, A.W. McEvoy⁴, L. Lemieux¹
¹UCL. Dept. of Clinical and Experimental Epilepsy, UCL Institute of Neurology. ²Epilepsy Unit, Neurology Dept., University Hospital and University of Geneva. ³Lysholm Dept. of Neuroradiology, National Hospital for Neurology and Neurosurgery. ⁴Victor Horsley Dept. of Neurosurgery, National Hospital for Neurology and Neurosurgery, London
- 11.45 O7 *“Diffusive Models of the BOLD Mechanism”*
J.D. Dickson¹, D.A. Yablonskiy², A.L. Sukstanskii², T.W.J. Ash³, G.B. Williams³, R.E. Ansorge¹
¹Cavendish Laboratory, Cambridge University, ²Mallinckrodt Institute of Radiology, Washington University in St Louis, ³Wolfson Brain Imaging Centre, Cambridge University
- 11.55 O8 *“Investigating the neural basis of fcMRI”*
M.J. Brookes¹, J.R. Hale¹, J.M. Zumer¹, S.T. Francis¹, C.M. Stevenson¹, G.R. Barnes², S.S. Nagarajan³, P.G. Morris¹
¹Sir Peter Mansfield Magnetic Resonance Centre, School of Physics and Astronomy, University of Nottingham, UK ²Wellcome Trust Centre for Neuroimaging, University College London, London, UK. ³Biomagnetic Imaging Laboratory, Department of Radiology, University of California, San Francisco, USA
- 12.05 O9 *“Concurrent 7T fMRI and 2D Optical Imaging Spectroscopy: Methods and Applications of”*
A.J. Kennerley¹, D.K. Johnston¹, Y. Zheng¹ and J. Berwick¹
¹SPiNSN, University of Sheffield, Sheffield, UK
- 12.15 O10 *“Letting your brain do the talking: a real-time fMRI communication channel”*
T.W.J. Ash¹, T.A. Carpenter¹, and G.B. Williams¹
¹Wolfson Brain Imaging Centre, University of Cambridge
- 12.25 Lunch
- 13.20 Poster Session

Afternoon Oral session 1: Quantitative Methods in Translational MRI

Session chairs: David Thomas (University College London) and Penny Gowland (University of Nottingham)

14:20 – 14:50 **Invited Speaker: Professor Xavier Golay**

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Institute of Neurology, UCL

“Quantitative MRI methods as biomarkers: how far are we?”

14.50 O11

“Vessel-Encoded Dynamic Angiography: Initial Experience in Healthy Volunteers and Patients”

T.W. Okell¹, M.A. Chappell^{1,2}, U.G. Schulz³, P. Jezzard¹
¹FMRIB Centre, University of Oxford, ²Institute of Biomedical Engineering, University of Oxford, ³Stroke Prevention Research Unit, University of Oxford

15.00 O12

“A Potential Method for Investigating Local Dynamics and Relative Regional Compliance of the Lung using Proton MRI and Image Registration Techniques”

A.R. Morgan^{1,2}, G.J.M. Parker^{1,2}, M.L.J. Scott³, T.F. Cootes^{1,2}, J.H. Naish^{1,2}
¹Imaging Science and Biomedical Engineering, University of Manchester, ²Biomedical Imaging Institute, University of Manchester, ³AstraZeneca, Alderley Park, Macclesfield

15.10 O13

“Parameterised optimised gradient waveform spin-echo sequence for diffusion weighted MR in a microstructure phantom”

B. Siow^{1,2}, I. Drobnjak¹, M.F. Lythgoe² and D.C. Alexander¹
¹Microstructure Imaging Group, Centre for Medical Image Computing, UCL. ²Centre for Advanced Biomedical Imaging, UCL

15.20 O14

“High resolution susceptibility mapping of multiple sclerosis lesions: a post mortem study”

S.J. Wharton¹, A. Blazejewska¹, J. Dixon¹, N. Mistry², N. Evangelou², J. Lowe³, P. Gowland¹, R. Bowtell¹
¹Sir Peter Mansfield Magnetic Resonance Centre, University of Nottingham, ²Clinical Neurology, Queens Medical Centre, Nottingham, ³Department of Pathology, Queens Medical Centre, Nottingham

15.30 O15

“Cardiac synchronisation with fixed frame rate for reducing physiologic instabilities in 3D brainstem FMRI”

R.H. Tijssen¹, K.L. Miller¹
¹FMRIB Centre, Oxford University

15.40 -16.00

Coffee Break

Afternoon Oral session 2: MR Physics

Session chairs: Ian Marshall (University of Edinburgh) and Richard Bowtell (University of Nottingham)

- 16.00 O16 “Shortened modified look-locker inversion recovery (ShMOLLI): Bypassing the requirement for complete recovery of longitudinal magnetisation for cardiac T1 mapping”
S.K. Piechnik¹, V.M. Ferreira¹, E.Dall’Armellina¹, L.E. Cochlin², S. Neubauer¹, M.D.Robson¹
¹Dept. Cardiovascular Medicine, ²Dept. of Physiology, Anatomy and Genetics, University of Oxford, Oxford, UK
- 16.10 O17 “Gating of multiple respiratory phases for 3D whole heart MRI using Golden-Radial phase encoding”
C. Kolbitsch¹, C. Prieto¹, J. Smink², T. Schaeffter¹
¹King’s College London, Division of Imaging Sciences, London, ²Philips Healthcare, Best, Netherlands, KCL
- 16.20 O18 “Multi-parametric evaluation of mild traumatic brain injury patients using support vector machine”
B.S. Aribisala¹, C.J.A. Cowie¹, J. He¹, J. Wood¹, A.D. Mendelow^{1,2}, P. Mitchell^{1,2}, A.M. Blamire¹
¹Institute of Cellular Medicine, Newcastle University, ²Dept of Neurosurgery, Newcastle University, Newcastle
- 16.30 O19 “Finite element simulations of short range diffusion of ¹²⁹Xe in models of acinar airways”
J. Parra-Robles, S.R. Parnell J. M. Wild
Unit of Academic Radiology, University of Sheffield, UK
- 16.40 O20 “Brain Temperature Mapping Using MR Spectroscopic Imaging”
J. Parikh^{1,2}, I. Marshall^{1,2}
¹SFC Brain Imaging Centre, Dept of Clinical Neurosciences (part of SINAPSE collaboration), ²Dept of Medical Physics, University of Edinburgh
- 16.50 O21 “Spider MRI: Spinning New Biomedical Webs”
G.D. Merrifield¹, J. Mullin², L. Gallagher², W.M. Holmes²
¹Preclinical MRI Small Research Facility, Medical Physics, University of Edinburgh, ²Glasgow Experimental MRI Centre, Clinical Neuroscience, Glasgow University
- 17.00 – 17:30 British Chapter AGM
- 17.30 – 18:00 **Commercialisation Adventures: Professor David Hawkes**
CMIC, UCL
- 18.30 Buses to Dinner (departing from the main visitors’ car park)
- 19.15 **Conference Dinner, City Council House**
- 23.00 – 23.30 Buses depart from ‘Tales of Robin Hood’ (returning to Hugh Stewart hall of residence)

Friday, 3rd September

08:00 – 09:00 7T tour (Please book at registration desk)

Morning Oral session 1: Clinical MRI

Session chairs: Nadeem Saeed (Pfizer) and Tim Jaspan (University of Nottingham)

- 09.00 – 09.30 **Invited Speaker: Professor Thierry Huisman**
John Hopkins University
“MR imaging of the pediatric brain: what outcome does it predict?”
- 09.30 O22 *“Texture analysis of T1 and T2 weighted magnetic resonance images and probabilistic neural network discriminates medulloblastomas, pilocytic astrocytomas and ependymomas of the posterior fossa in children”*
N. Vlachos^{1,2}, E. Orphanidou-Vlachou^{1,2}, N.P. Davies^{1,2,3}, T.N. Arvanitis^{1,2}, R.G. Grundy^{4,5}, A.C. Peet^{1,2}
¹University of Birmingham, ² Birmingham Children’s Hospital, ³University Hospital Birmingham, ⁴University of Nottingham ⁵University Hospital Nottingham
- 09.40 O23 *“Serial dissection of the human oculomotor efference copy circuit using DTI tractography”*
R. Rafal, P. Mullins, J. Bultitude
Wolfson Centre for Clinical and Cognitive Neuroscience, Bangor University
- 09.50 O24 *“Investigating brain development in childhood using TBSS”*
K. K. Seunarine¹, J. D. Clayden¹, S. Jentschke¹, M. Muñoz¹, J. Cooper¹, M. J. Chadwick^{1,2}, T. Banks³, F. Vargha-Khadem¹ C. A. Clark¹
¹ Institute of Child Health, University College London, ² Wellcome Trust Centre for Neuroimaging, Institute of Neurology, University College London, ³ Great Ormond Street Hospital for Children, London
- 10.00 O25 *“Probabilistic tractography of the optic radiation in children: an anatomical and quantitative study”*
M. Dayan¹, K. Riney¹, T. Banks², C.A. Clark¹
¹Radiology and Physics Unit, UCL Institute of Child Health, ²Radiology Department, Great Ormond Street Hospital, UCL
- 10.10 O26 *“Contrast-enhanced micro-Diffusion Tensor Imaging for Mouse Embryo Phenotyping”*
J. O. Cleary^{1,2*}, B. Siow^{1,3*}, N. D. E. Greene⁴, P. Daga³, M. Modat³, R. J. Ordidge², S. Ourselin³, D.C. Alexander³, M. F. Lythgoe¹
¹Centre for Advanced Biomedical Imaging, Department of Medicine and Institute of Child Health, UCL, ²Department of Medical Physics and Bioengineering, UCL, ³Centre for Medical Image Computing, UCL, ⁴Neural Development Unit, Institute of Child Health, UCL, UCL, * equal contribution

10.20 O27 *“Probing oxygen delivery in the kidney using dynamic oxygen-enhanced MRI”*
K.F. Holliday¹, G.J.M. Parker¹, J.J. Tessier² and J.H. Naish¹
¹Biomedical Imaging Institute, University of Manchester, ²AstraZeneca, Alderley Park, Macclesfield

10:30 – 10:50 Coffee break

Morning Oral session 2: Molecular Imaging

Session chairs: David Buckley (University of Leeds) and John Owers Bradley (University of Nottingham)

10.50 – 11.20 **Invited Speaker: Professor Silvio Aime**
University of Turin
“Routes to improved MR-Molecular Imaging Probes”

11.20 O28 *“Experimental Methods and Data Analysis For Studying Diffusion in The Lung Using Hyperpolarized 3He MRI”*
I.K. Ball¹, K.S. Panesar¹, J.R. Owers-Bradley¹, M. Narayanan², C. Beardsmore², M. Silverman²
¹School of Physics & Astronomy, University of Nottingham, ²Department of Infection, Immunity, and Inflammation, University of Leicester

11.30 O29 *“MRS of a mouse model of Alzheimer's Disease - comparison of in vitro and in vivo spectroscopy”*
D.M. Forster¹, M.F. James², J.C. Richardson³, S.R. Williams¹
¹Imaging Science and Biomedical Engineering, University of Manchester, ²The Nineveh Charitable Trust, ³GlaxoSmithKline, Harlow

11.40 O30 *“Modified gadolinium labelled liposomes for increased uptake in tumour cells for enhanced drug delivery”*
T. L. Kalber¹, N. Mitchell², S. Walker-Samuel¹, H.C. Hailes², A. B. Tabor², Sam M. Janes³, M.F. Lythgoe¹
¹Centre of Advanced Biomedical Imaging, UCL, London, ²Department of Chemistry, UCL, London, ³Centre for Respiratory Research, UCL

11.50 O31 *“The size of cytoplasmic lipid droplets is a critical factor to the visibility of NMR lipid signal”*
X Pan^{1,2}, M Wilson^{1,2}, C.M. McConville¹, M Brundler², T.N. Arvanitis^{1,2}, J Griffin³, R.A. Kauppinen⁴, A.C. Peet^{1,2}
¹University of Birmingham, UK ²Birmingham Children's Hospital NHS Foundation Trust, UK ³University of Cambridge, UK ⁴Dartmouth College, Hanover, New Hampshire, USA

12.00 O32 *“MRI detection of axonal transport via tetanus neurotoxin bound iron oxide nanoparticles”*
S. Richardson¹, G. Menendez³, B. Siow¹, J. Wells¹, E.M.C. Fisher², G Schiavo³, M. F. Lythgoe¹
¹ UCL Centre for Advanced Biomedical Imaging; ² UCL Institute of Neurology; ³ Cancer Research UK

12.10 O33 *“A simplified model for targeted magnetic delivery of cells with an MRI scanner”*
J. Riegler^{1,2}, Q. A. Pankhurst³ and M. F. Lythgoe¹
¹Centre for Advanced Biomedical Imaging, Department of Medicine, University College London (UCL), London ²Centre for Mathematics and Physics in the Life Sciences and Experimental Biology (CoMPLEX), UCL ³Davy-Faraday Research Laboratory, The Royal Institution of Great Britain, London

12:20 Lunch
13.10 Poster Session

Afternoon Oral session 1: MR in Cancer

Session chairs: Harry Parkes (Institute of Cancer Research) and Dorothee Auer (University of Nottingham)

- 13.45 – 14.15 **Invited Speaker: Professor Nandita deSouza**
Institute of Cancer Research
“Diffusion weighted imaging--applications in the pelvis”
- 14.15 O34 *“Pre-clinical assessment of metastatic colorectal carcinoma progression and response to treatment”*
S.P. Johnson¹, S. Walker-Samuel², V. Rajkumar¹, M.P. Robson¹, M. Pule¹, R.B. Pedley¹, M.F. Lythgoe²
¹UCL Cancer Institute, London, ²UCL Centre for Advanced Biomedical Imaging, Dept of Medicine, London
- 14.25 O35 *“Baseline tumour edge characteristics in contrast-enhanced MRI predict survival in glioblastoma multiforme”*
G. Thompson¹, E. Darley¹, J.R. Cain¹, S.J. Mills¹, A. Jackson¹
¹Biomedical Imaging Institute, University of Manchester
- 14.35 O36 *“Pharmacokinetic modelling of DCE-MRI at moderate temporal resolution: dealing with tumours which wash out extremely rapidly”*
D.J. Manton, M.D. Pickles, M. Lowry, L.W. Turnbull
YCR Centre for MR Investigations, Hull-York Medical School, Hull, East Yorkshire
- 15.45 O37 *“Bimodal iron oxide nanoparticles for MR imaging and hyperthermia therapy in cancer”*
K. L. Parcell^{*1}, T Kalber^{*1}, S. Walker-Samuel¹, P. Southern³, Q. A. Pankhurst³, S. M. Janes², and M. F. Lythgoe¹
¹UCL Centre for Advanced Biomedical Imaging, ²Centre for Respiratory Research, UCL, ³Davy-Faraday Research Laboratories, The Royal Institution of Great Britain, London, *equal contribution
- 15.55 O38 *“Monitoring tumour oxygenation with hyperpolarised pyruvate”*
S. Reynolds¹, S. Kazan², L. Williams², A. Kennerley³, J. Berwick³, G. M. Tozer², M. Paley¹
¹Radiology, ²Oncology, Medical School; ³Psychology, Sheffield University

15.05 O39 *“A multi centre study of 1H magnetic resonance spectroscopy in the diagnosis and prognosis of brain stem tumours in children”*
S.K. Gill^{1,2}, L.M. Harris^{1,2}, N.P. Davies^{1,2}, Y. Sun^{1,2}, K. Natarajan^{1,2}, L. MacPherson^{1,2}, T.N. Arvanitis^{1,2}, D. Hargrave^{3,4}, G.S. Payne^{3,4}, M.O. Leach^{3,4}, F.A. Howe⁵, P.Morgan⁶, D. Saunders⁷, D.P. Auer⁶, T. Jaspán⁶, R.G. Grundy⁶, A.C. Peet^{1,2}
¹Cancer Sciences, University of Birmingham, Birmingham, ²Birmingham Children’s Hospital, Birmingham, ³Royal Marsden Hospital, Sutton, ⁴Institute of Cancer Research, Sutton, ⁵St. Georges, University of London, ⁶Children’s Brain Tumour Research Centre, Nottingham University Hospitals, ⁷Great Ormond Street Hospital, London, United Kingdom

15:15- 15:45 Coffee Break

Afternoon Oral session 2: MR Hardware

Session chairs: Pete Thelwall (Newcastle University) and Paul Glover (University of Nottingham)

15.45 – 16.15 **Invited Speaker: Professor Klaas Prüssmann**
Swiss Federal Institute of Technology, Zurich
“Dynamic Magnetometry during MRI”

16.15 O40 *“Automated tuning and matching of transmit arrays with a piezoelectric motor”*
C.T. Rodgers^{1,2}, C.J. Snyder¹, L. DelaBarre¹, J. Tian¹, C. Akgun¹, M.D. Robson², J.T. Vaughan¹
¹CMRR, University of Minnesota (USA), ²OCMR, University of Oxford

16.25 O41 *“SAR as a function of position and power concerns for travelling wave MRI”*
D.J. Lee¹, P.M. Glover¹
¹SPMMRC, University of Nottingham

16.35 O42 *“Spin exchange polariser incorporating an external cavity diode laser for 129Xe MRI of the lung”*
S.R.Parnell, S.Ajraoui, M.H.Deppe, H.Marshall, G.Norquay, J.Parra-Robles, P.Xu and J.M.Wild
Academic Unit of Radiology, University of Sheffield

16.45 O43 *“Spatially uniform excitations using parallel transmission for 3D MP-RAGE at 3T”*
S.J. Malik, J.V. Hajnal
Robert Steiner MRI Unit, Imaging Sciences Department, MRC Clinical Sciences Centre, Hammersmith Hospital, Imperial College London

16.55 O44 *“Methods for the spatial localisation of field-cycling relaxometric data”*
K.J. Pine¹, F. Goldie², D.J. Lurie¹
¹Aberdeen Biomedical Imaging Centre, University of Aberdeen, ²Tesla

17:05 Adjourn

17:05 – 17:15 Awards of Prizes and Close