University of Birmingham

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About

Dr Peet is a Reader in Paediatric Oncology at the University of Birmingham and an Honorary Consultant at Birmingham Children's Hospital. His research interests are centred on developing magnetic resonance imaging for the investigation of childhood cancer. He is the lead of the Brain Tumour Research Group at the University of Birmingham which is developing functional imaging for the diagnosis, understanding and management of childhood brain tumours.

Qualifications

- Reader in Paediatric Oncology
- Fellow of Royal College of Paediatrics and Child Health 2005
- Member of Royal College of Physicians (UK) Paediatrics, February 1998
- MBBS in Medicine, St Georges Hospital Medical School, University of London, 1994
- PhD Chemistry, University of Cambridge 1987
- BA Natural Sciences, University of Cambridge 1984

Biography

Dr Peet is a Reader in Paediatric Oncology at the University of Birmingham and an Honorary Consultant at Birmingham Children's Hospital. His research interests are centred on developing magnetic resonance imaging for the investigation of childhood cancer. He is the lead of the Brain Tumour Research Group at the University of Birmingham which is developing functional imaging for the diagnosis, understanding and management of childhood brain tumours. The group has a mixture of backgrounds with physics, computing, biology and clinical medicine all represented.

He is also the research lead of the new National Institute for Health Research, 3T Magnetic Resonance Research Centre at the Birmingham Children's Hospital. Dr Peet is the principal investigator of the UK Cancer Imaging Programme for children funded by Cancer Research UK, the Engineering and Physical Sciences Research Council, the Medical Research Council and National Institute for Health Research.

He was a founder member of the Children's Cancer and Leukaemia Group's (CCLG) Functional Imaging Group and is now the Chair of this group. He is also the co-Chair and a founder member of the SIOPE (International Society of Paediatric Oncology Europe) Brain Imaging Group. He was the previous clinical manager of two large multi-centre European Union Framework 6 projects eTumour and Health Agents.

Dr Peet is closely involved in developing functional imaging within clinical trials and is a member of the National Cancer Research Institute's CCLG Brain Tumour Subgroup and New Agents Subgroup. Clinical imaging research is backed up by programme of laboratory research based at Cancer Sciences and the Henry Wellcome Building for Biomolecular NMR Spectroscopy.

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Teaching

- Lead of Paediatrics (from October 2011)
- Lecture on MSc in Clinical Oncology

Postgraduate supervision

Lead supervisor for PhDs

- 3 completed
- 1 writing up
- 2 current

Co-Supervisor for PhDs

- 4 completed
- 3 current

Research

Dr Peet and his research group are developing novel imaging techniques for the diagnosis, management and understanding of childhood cancer. Magnetic Resonance Imaging (MRI) is a crucial investigation in children with solid tumours but whilst it provides images of superb clarity, it gives little information on how aggressive a tumour is or whether it will respond to treatment. The aim is to address these issues by developing non-invasive methods which can tailor the treatment to the individual patient.

The group's research has concentrated on magnetic resonance spectroscopy, a technique which can be readily combined with MRI in the hospital but which provides a chemical profile of the tumour. These chemical profiles have been shown by the team to be useful as a diagnostic aid and this is becoming integrated into clinical practice. In addition, several biomarkers of tumour aggressiveness have been identified and evaluated. This is valuable information in making treatment decisions on patients. The expertise developed in Birmingham is being translated to other centres in the UK and beyond.

The clinical imaging is being backed up by a laboratory programme of research with groups in Cancer Sciences in which more complete chemical profiles are being measured from tumour tissue using the technique of Magic Angle Spinning NMR Spectroscopy. These more detailed chemical profiles provide an insight to the molecular pathways which are activated in the tumour which could provide targets for new therapeutic agents. Performing NMR Spectroscopy on cell lines has led to biomarkers of chemotherapy response being discovered and given a more in depth understanding of the processes which lead to the chemical profiles measured in vivo.

A key collaboration with Dr Arvanitis in Electrical, Electronic and Computer Engineering has allowed the development of novel analysis methods for both in vivo and ex vivo magnetic resonance spectroscopy data and bioinformatics. This important initiative is allowing more information to be obtained from the data and its presentation in a way which is more amenable to clinicians.

Increasingly, other novel imaging techniques such as diffusion tensor imaging and perfusion imaging are being added to the magnetic resonance spectroscopy. These complimentary techniques allow a more complete picture of tumour biology to be made from the clinical imaging.

Publications

Ladan Mirbahai, Martin Wilson, Christopher S. Shaw, Carmel McConville, Roger D. G. Malcomsonc, Julian L. Griffin, Risto A. Kauppinen, Andrew C. Peet. (2010) 1H Magnetic Resonance Spectroscopy Metabolites as Biomarkers for Cell Cycle Arrest and Cell Death in Rat Glioma Cells submitted to International Journal of Biochemistry and Cell Biology, epub July 2010.

Martin Wilson, Greg Reynolds, Risto A. Kauppinen, Theodoros N. Arvanitis and Andrew C. Peet, (2011) A constrained least-squares approach to the automated quantitation of in-vivo 1H MRS data. Magnetic Resonance in Medicine, 65(1): 1-12.

Lisa M Harris, Nigel Davies, Lesley MacPherson, Shaun Wilson, Martin English, Marie-Anne Brundler, Theodoros N Arvanitis, Richard Grundy, Andrew C Peet, (2010) Short echo time single voxel 1H Magnetic Resonance Spectroscopy in the diagnosis and characterisation of pineal region tumours, Pediatric Blood and Cancer, in press June 2010.

Martin Wilson, Nigel P Davies, Yu Sun, Kal Natarajan, Theo N Arvanitis, Risto A Kauppinen and Andrew C Peet A (2010) comparison between simulated and experimental basis sets for the analysis of short-echo in-vivo 1H MRS data at 1.5T. NMR in Biomedicine in press Feb 2010.

N. P. Davies, M. Wilson, K. Natarajan, Y. Sun, L. MacPherson, M-A. Brundler, T. N. Arvanitis, R. G. Grundy, and A. C. Peet, (2010) Non-invasive detection of glycine as a biomarker of malignancy in childhood brain tumours using in-vivo 1H MRS at 1.5 Tesla and ex-vivo high-resolution magic-angle spinning NMR, NMR in Biomed; 23(1): 80-7. PMID 19795380.

Martin Wilson, Nigel P Davies, Marie-Anne Brundler, Carmel McConville, Richard G Grundy and Andrew C Peet, (2009) High Resolution Magic Angle Spinning 1H NMR of Childhood Brain and Nervous System Tumours, Molecular Cancer, 8:6. doi:10.1186/1476-4598-8-6. PMID 19208232

Lisa M Harris, Nigel P Davies, Lesley MacPherson, Shaheen Lateef, Kal Natarajan, Marie-Anne Brundler, Spyros Sgouros, Martin W English, Theodoros N Arvanitis, Richard G Grundy and Andrew C Peet, (2008) Magnetic Resonance Spectroscopy in the assessment of Pilocytic Astrocytomas, Eur J Cancer, 44: 2640-7. PMID 18835152

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