Job Description

Magnetic Resonance Physicist

Department/Division/Faculty: Brain Sciences
Campus location: Hammersmith (East Acton)
Job Family/Level: Research/Research Assistant or Research Associate
Salary Range: £35,477 - £38,566 per annum (without a PhD) – Research Assistant
£40,215 - £47,579 per annum (with a PhD) – Research Associate
Responsible to: Dr Sudhin Thayyil
Key Working Relationships (internal): Members of the Centre for Perinatal Neuroscience, other physicists and imaging scientists throughout Imperial, Radiographers, Electrical Engineering Department, Imperial College London
Key Working Relationships (external): Research and clinical MR Radiographers at the recruiting sites in India, and MR radiographers within the 3 Tesla MARBLE MR Biomarker consortium (8 NHS hospitals, and 2 centres in USA) and the HELIX consortium (India, Sri Lanka and Dhaka) led by Dr Thayyil. MR Physics Collaborators at Wayne State University and Medical University of South Carolina, and vendors (MR physicists at Philips, Siemens and GE)
Contract type: Full time, fixed-term for 4 years in the first instance

Research Programme
Imperial College London has a long tradition of world leading research into neonatal neurology, including pioneering work into rescue hypothermic neuroprotection, and is the first hospital in the world to have 3T MR scanner in the neonatal unit.

The Centre for Perinatal Neuroscience is a multidisciplinary group including clinical fellows, research nurses, and neurologists, and is led by Dr Sudhin Thayyil. There are close links with the Robert Steiner MR unit and the Clinical Imaging Facility at Hammersmith Hospital. We lead a national and international multi-centre collaborative platform for neuroprotection trials, with a key aim to deploy quantitative MR spectroscopy techniques as routine clinical tools. Our current research program is focused on evaluating therapeutic interventions for reducing brain injury and death related to perinatal asphyxia (neonatal encephalopathy) using surrogate MR spectroscopy biomarkers and is the world’s largest clinical research program in neonatal encephalopathy.

Our recent work has shown that absolute quantification of thalamic N-acetyl aspartate [NAA] accurately predicts long term outcomes after neonatal encephalopathy and is an ideal surrogate biomarker for neonatal neuroprotection trials (Lally et al Lancet Neurology 2019). We are now conducting a number of early phase clinical trials, using thalamic [NAA] as a surrogate end point including the HELIX (Hypothermia for Encephalopathy in Low and Middle-income countries) trial, and the COMET (Cooling in Mild Encephalopathy).
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The centre has a strong track recording of nurturing and supporting early career academics including MR physicists. Our staff has been awarded two NIHR doctoral fellowships and 1 MRC doctoral fellowships in the past four years.

**Purpose of the Post**

This post is funded by a large NIHR program grant to Dr Thayyil, which involves MR imaging (including diffusion tensor and functional MR imaging) and spectroscopy in 2000 term babies with neonatal encephalopathy recruited from 3 centres in south India (Bangalore, Chennai and Calicut). We are looking for a talented and ambitious MR Physicist with in-depth knowledge and experience of MR spectroscopy and pulse programming. The primary purpose of the post is to lead MR spectroscopy and diffusion tensor imaging acquisition and post processing aspects. The post holder should be able to support and train other MR physicists, radiologists and radiographers within the consortium on advanced MR spectroscopy acquisition and post processing methods, and to maintain the competitive edge of United Kingdom in neonatal neuroprotection.

The post holder will be a HCPC registered Clinical Scientist who will take responsibility for cross-platform sequence (Siemens, Phillips and GE) development; for MR data acquisition, collection and analysis across the UK as well as in India, Bangladesh, and Sri Lanka; and will be required to undertake frequent overseas travel to support ongoing MR studies.

The post holder will be encouraged to register for a PhD program at Imperial College. In addition, the post-holder will be expected to submit publications to high impact journals and refereed to attract external research funding. The post is ideal for an academic high-flyer in MR Physics and the post holder should be committed to an academic career in MR Physics. Excellent mentoring and support will be available for the same. Candidates who have recently completed PhD are also welcome to apply.

**Key Responsibilities**

To lead and undertake research of the highest quality in the broad area of neonatal cerebral MR spectroscopy and diffusion tensor imaging.

- MR Physics lead for recruiting sites in India and the MARBLE consortium including training and support of MR physicist, and radiographers in the consortium on MR spectroscopy acquisition and post-processing.
- Maintain and optimise our in-house automated cerebral MR spectroscopy post-processing methods
- Liaise with major MR vendors (Phillips, Siemens and GE) on optimising cross platform MR spectroscopy sequences
- Work with Imperial Innovations and Imperial Business school in exploitation of intellectual property of MR post-processing methods and developing spin out companies, if appropriate.
- MR data governance and secure storage of the MR data from multicentre studies at Imperial College London in line with data protection act (UK).
- Publish research papers in peer-reviewed journals
- Attend and present work at international conferences
- Obtain research grants from national and international funding bodies, and obtain funding from industry where appropriate
- Supervise postgraduate students and undergraduate research projects

**Teaching**

- Supervision of neuroscience masters students where relevant
- Contribute to teaching on the MSc in Biomedical Engineering (Medical Physics and Imaging) and to the MRes in Bio Imaging Science at Imperial College London
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Research Duties
- Take responsibility for methodology development projects in the areas outlined above.
- Develop an independent research interest in an area aligned to the research areas listed.
- Interface with and support a variety of clinician-led imaging research programmes.
- Ensure MR research at the Imperial CPN is carried out to the highest possible standard.
- Design and implement novel MRI/MRS methods and effect improvements to existing techniques.
- Implement MRI/MRS pulse sequences described in the literature or acquired through external collaborations.
- Support a range of studies and technical systems with different rates of change and degrees of complexity.
- Take responsibility for the optimal acquisition and analysis of cross-platform MR data and assist all other aspects of data analysis.
- Use programming skills to implement novel analysis platforms, as well as those described in the literature.
- Maintain up-to-date knowledge of state of the art MR techniques.
- Present findings to colleagues and peers.
- Assist with the publication of findings.
- Attend relevant workshops and conferences as necessary.
- Develop contacts within the College and the wider community.
- Promote the reputation of the Group, the Department and the College.
- Write reports for submission to research sponsors.
- Present findings via publications to referred journals and to colleagues at conferences.
- Provide guidance to staff and students.

Other Duties
- Ensure, by liaising with senior team members that all the equipment in his/her work area is maintained and working correctly.
- To liaise with equipment manufacturers in maintenance of the scanners and ancillary equipment.
- Monitor and maintain a safe working environment in accordance to Health & Safety procedures.
- Demonstrate a depth and breadth of knowledge in MRI techniques.
- Provide advice to other staff and students.
- Demonstrate MRI techniques to students, visitors and other members of the department.
- Participate in core support tasks, including data management.
- Undertake appropriate administration tasks.
- Be responsible for ensuring that data is accurate, up-to-date and complete.
- Undertake any necessary training and/or development.
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#### Person Specification

**Requirements**
Candidates/post holders will be expected to demonstrate the following:

<table>
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<tr>
<th>Education</th>
<th>Essential (E)/ Desirable (D)</th>
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<tbody>
<tr>
<td>- Undergraduate or MSc degree in physics, engineering, mathematics, computer science or related discipline</td>
<td>E</td>
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<tr>
<td>- Registered with the HCPC as a Clinical Scientist</td>
<td>D</td>
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<tr>
<td>- PhD in a relevant area of MR Physics (or with PhD thesis submitted prior to beginning in this post)</td>
<td>D</td>
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<thead>
<tr>
<th>Experience</th>
<th>Essential (E)/ Desirable (D)</th>
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<tr>
<td>- In depth understanding of MRI physics</td>
<td>E</td>
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<tr>
<td>- Experience in pulse programming with Philips, Siemens or GE</td>
<td>D</td>
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<tr>
<td>- Experience in neonatal cerebral MR spectroscopy in all the three main MR systems: Siemens, Philips and GE</td>
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<td>- Strong programming skills in a variety of languages (C/C++/Python/MATLAB)</td>
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<td>- Knowledge of research methods and statistical procedures</td>
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<td>- Practical experience within a research environment and / or publication in relevant and refereed journals</td>
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<td>- Experience in the techniques specified in the job description</td>
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<td>- Commitment to an academic career in MR Physics</td>
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<tr>
<th>Skills &amp; Abilities</th>
<th>Essential (E)/ Desirable (D)</th>
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<tr>
<td>- Ability to develop and apply new concepts</td>
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<td>- Creative approach to problem-solving</td>
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<td>- Excellent verbal communication skills and the ability to deal with a wide range of people</td>
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<td>- Excellent written communication skills and the ability to write clearly and succinctly for publication</td>
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<tr>
<td>- Ability to communicate well with scientists, engineers, health professionals and to work as part of a team</td>
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<td>- Ability to direct the work of a small research team and motivate others to produce a high standard of work</td>
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<td>- Ability to organise own work with minimal supervision</td>
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<td>- Self-motivated, able to work independently as well as be part of a multidisciplinary team, and be intellectually flexible</td>
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<td>- Ability to prioritise own work in response to deadlines</td>
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<td>- An absolute commitment to safety in an MR environment</td>
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<td>- Advanced computer skills, including word-processing, spreadsheets and the Internet</td>
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<tr>
<th>Personal Attributes</th>
<th>Essential (E)/ Desirable (D)</th>
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<tr>
<td>- Willingness to work as part of a team and to be open-minded and cooperative</td>
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<td>- Flexible attitude towards work</td>
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<td>- Discipline and regard for confidentiality and security at all times</td>
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<td>- Willingness to undertake any necessary training for the role</td>
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<td>- Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences</td>
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<td>- A meticulous approach and attention to detail</td>
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<td>- An open, flexible and positive approach to working in a constantly changing environment</td>
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- The post holder should be prepared to work unsociable hours as work demands from time to time.

Please note that job descriptions cannot be exhaustive and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to eliminating discrimination. All employees are expected to follow the [7 Imperial Expectations](#) detailed below:

1) Champion a positive approach to change and opportunity
2) Communicate regularly and effectively within and across teams
3) Consider the thoughts and expectations of others
4) Deliver positive outcomes
5) Encourage inclusive participation and eliminate discrimination
6) Support and develop staff to optimise talent
7) Work in a planned and managed way

Employees are also required to comply with all College policies and regulations paying special attention to:

- Confidentiality
- Conflict of Interest
- Data Protection
- Equal Opportunities
- Financial Regulations
- Health and Safety
- Information Technology
- Smoking
- Private Engagements and Register of Interests

They must also undertake specific training and assume responsibility for safety relevant to specific roles, as set out on the [College Website Health and Safety Structure and Responsibilities](#) page.

The College is a proud signatory to the San Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see [https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/](https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/)

The College believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes where their use is shown to be necessary for developing new treatments and making medical advances. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in the College’s care are treated with full respect, and that all staff involved with this work show due consideration at every level.[http://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-integrity/animal-research/](http://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-integrity/animal-research/)

Committed to equality and valuing diversity, we are an Athena SWAN Silver Award winner, a Stonewall Diversity Champion, a Disability Confident Employer and work in partnership with GIRES to promote respect for trans people.