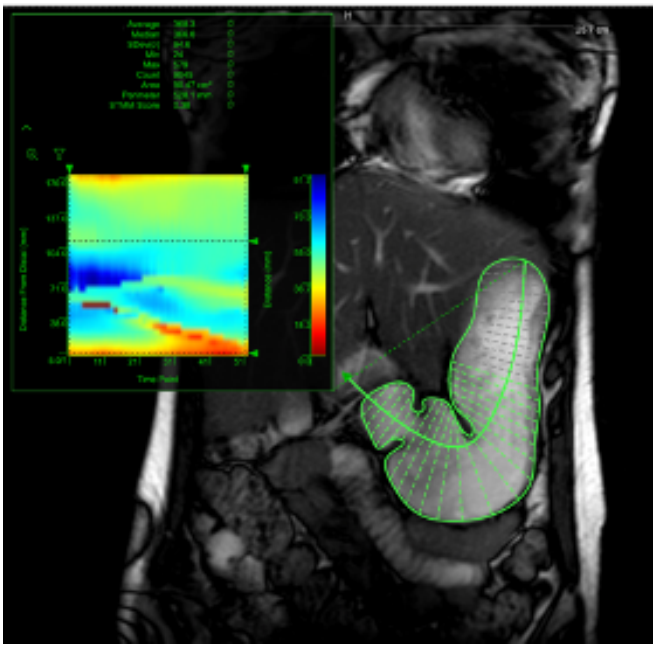
We are seeking a Post Doctoral Research Fellow to drive forward the development of MRI sequences for imaging motility of the gastrointestinal (GI) tract. The work is funded by the Michael J Fox Foundation and the application is to patients with Parkinson's disease where symptoms may become apparent in the gut before the more classic neurological symptoms



The successful applicant will be part of a team spanning UCL Centre for Medical Imaging, Clinical and Movement Neurosciences, Liver and Digestive Health, Cardiovascular Science and Motilent – a SME that develops software for quantifying gut motility. The grouping has extensive expertise in running MR imaging trials, developing new MR sequences, MR image reconstruction and the quantitative analysis of MR images

The postholder will help conduct a high-quality programme of research that centres on the development and application of new and emerging gastrointestinal MRI techniques. The optimal technique will then be selected and used as part of a clinical trial. The postholder will form a key part of the technique development and set-up and they will be expected to help and advise in the running of the clinical trial.

This post is funded for 2 years in the first instance.

Key requirements

- The post holder will have previous experience with MRI research and sequence development.
- Experience with pulse programming and MR image reconstruction is highly desirable.

To apply:

- Register with UCL Jobs (https://www.ucl.ac.uk/work-at-ucl/search-jobs)
- Link to application will be posted on
    - https://www.ucl.ac.uk/medical-imaging/ucl-centre-medical-imaging
    - https://twitter.com/CMI_UCL
    - Or email uclcentreformedicalimaging@gmail.com to be notified when job goes live

LONDON'S GLOBAL UNIVERSITY

Job Description

Research Fellow

Grade: 7

Division of Medicine - Imaging

Location: Charles Bell House & Zayad Centre for Research

Duration 2 years.

Reports to:

Professor David Atkinson and Dr Jennifer Steeden

Context

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The Centre for Medical Imaging (CMI) has expertise in multimodality gastrointestinal, oncological, musculoskeletal and neurological imaging as well as medical physics, statistical methodology, health economics, modelling, and health behaviour. The academic department is co-located with other UCL Engineering and Surgery groups and works closely with University College London Hospitals NHS Foundation Trust (UCLH), one of the largest NHS trusts in the United Kingdom.

Our group aims to develop new and non-invasive magnetic resonance imaging (MRI) techniques to assess the function of the gastrointestinal tract. Recent work has focused on quantification of small bowel motility in Crohn's disease in collaboration with UK and European partners. However, the application of these methods will extend to the upper and lower gastrointestinal tract and beyond inflammatory bowel diseases such as Crohn's. Further development and validation of these techniques will provide an essential tool for understanding gastrointestinal physiology. We are committed to the transfer of knowledge and expertise between academic institutions and with commercial enterprises.

About the Department of Clinical and Movement Neurosciences

The UCL Queen Square Institute of Neurology Department of Clinical and Movement Neurosciences is a world-leading group that brings together expertise across the clinical and basic science spectrum of the physiology and pathology of human movement and movement disorders. The Department incorporates groups from the Queen Square and Royal Free campuses of the Institute and includes the Reta Lila Weston Institute and the Movement Disorders Centre.

The Department is in a unique position of pursuing research in basic neuroscience that is of direct translational benefit to neurological disorders such as Parkinson's disease, dystonia, stroke, motor neurone disease, peripheral nerve disorders and spinal cord injury. Our Research Groups use a powerful combination of

modern non-invasive research technology, theoretical and computational approaches and a variety of cellular, animal and human models to explore how the brain controls normal movement, and how disease leads to disordered control of movement. Current clinical research programmes involve TMS, repetitive TMS, EEG, MEG, fMRI and structural MRI (VBM, DTI), while translational programmes include use of cell culture, molecular biology and transgenic approaches. We have a strong interest in the cognitive aspects of motor control, including brain mechanisms of decision making and response selection. This is supported by sophisticated neurophysiological techniques for the monitoring of large populations neurons in active brain networks. We have numerous collaborative scientific and clinical research links across the Institute of Neurology, UCL and particularly strong links with the National Hospital for Neurology and Neurosurgery.

Liver and Digestive Health has expertise in ….

UCL Institute of Cardiovascular Science has a multi-disciplinary group of MR physicists based in the Centre for Cardiovascular Imaging group. The team has vast experience in development of non-Cartesian 2D and 3D MRI techniques, for rapid imaging. We have experience in undersampled image reconstruction methods, including parallel imaging and compressed sensing reconstruction and more recently, have become leaders in the use of Machine Learning reconstruction of non-Cartesian MRI data. We have significant experience in translating these novel technologies into real world clinical practice, with online reconstructions (in the Siemens ICE environment, or Gadgetron). This has enabled us to reduce cardiac MRI scans from 1 hours to 15 minutes in some children, and more than double the number of patients scanned per year at Great Ormond Street hospital, with no additional costs. This group is recognised as international leaders in real-time imaging for Cardiovascular applications (including during active exercise and interventions) and are excited to translate these fast technologies into the gut.

The successful candidate will have the opportunity to further develop these in multi-nuclear imaging. They will develop MR sequences and reconstruction methods with the aim of improving the information we can get about gut motility. This is likely to include the use of cine imaging, methods for rapid non-Cartesian undersampled imaging and reconstruction, using techniques from Compressed Sensing and Deep Learning. Sited within UCLH, a UCL-owned Philips Ingenia MRI scanner with dedicated, day-time research access is available for pulse sequence development, and at the Institute of Cardiovascular Science, Siemens scanners are available for pulse sequence development. An aim of the project is to transfer some of our successful rapid cardiac imaging to the imaging of the gut. Seamless translation of these techniques into the clinical environment is necessary to enable imaging of patient populations.

Main purpose of the job

- To develop novel MRI techniques for imaging motility of the gastrointestinal tract
- To apply the techniques to a cohort of individuals at different stages of Parkinson's disease
- To contribute to the development and technical validation of novel quantitative biomarkers of gastrointestinal function

Duties and responsibilities:

- To help conduct a high-quality programme of research that centres on the development and application of new and emerging gastrointestinal MRI techniques
- To acquire and analyse medical imaging data and assist with ongoing trials.
- To scan participants according to ethically approved protocols and Good Clinical Practice
- To help obtain ethical and NHS permission for imaging studies and fulfil reporting requirements
- To draft scientific presentations and publications.
- To attend all research group meetings, as directed by the PI.
- Help in further grant writing.
- In consultation with the PI, to contribute to the training of junior staff.

- Contribute to the management/maintenance of the laboratory.
- Maintain accurate records of experimental work.
- To attend seminars and other departmental meetings as required.
- To participate in any laboratory duties commensurate with the grade as required.
- To be aware of and act upon:
    - Disciplinary procedure and Disciplinary rules.
    - Grievance procedure.
    - Section 7 and 8 of the Health and Safety at Work Act.
    - Departmental Fire Guidelines.
    - Equal Opportunities Policy.
    - To comply with the Health & Safety regulations of the department

Person specification

Criteria	Essential or Desirable	Assessment method (Application/Interview)
Qualifications, experience and knowledge		
PhD in MRI, or related discipline (completed or writing up)	Essential	A/I
Skills and abilities		
Experience in gut imaging using MRI	Desirable	A/I
Experience in MRI sequence development	Essential	A/I
Experience in development of MRI reconstructions	Desirable	A/I
Experience in Machine Learning	Desirable	A/I
Experience in MRI non-Cartesian trajectories	Desirable	A/I
Translation of novel MRI technologies into the clinical environment	Desirable	A/I
Experience in programming C/C++ language	Essential	A/I
Experience of working with MRI images (DICOM format)	Essential	A/I
Proven track record of publishing in peer reviewed journals	Desirable	A/I
Understanding of information governance, privacy and security issues	Essential	A/I
Presentation of research through conferences or lectures	Essential	A/I
Experience in scientific software development: unit tests, revision control, open source releases	Desirable	A/I
Working in multi-disciplinary teams and international collaborations	Desirable	A/I
Personal attributes		
Ability to manage own time and prioritise workload to meet project deadlines	Essential	A/I
Ability to debug code	Essential	A/I
Ability to communicate with science-based and clinical audiences	Essential	A/I
Desire to develop and extend the role	Essential	A/I
Self-motivated and ability to work on own initiative	Essential	A/I
Willingness and ability to work collaboratively with colleagues	Essential	A/I
Commitment to high quality academic research	Essential	A/I

Criteria	Essential or Desirable	Assessment method (Application/Interview)
Commitment to continuous professional development	Essential	I
Commitment to fostering a positive work/learning environment	Essential	A/I