

# Division of Neuroradiology and Neurophysics

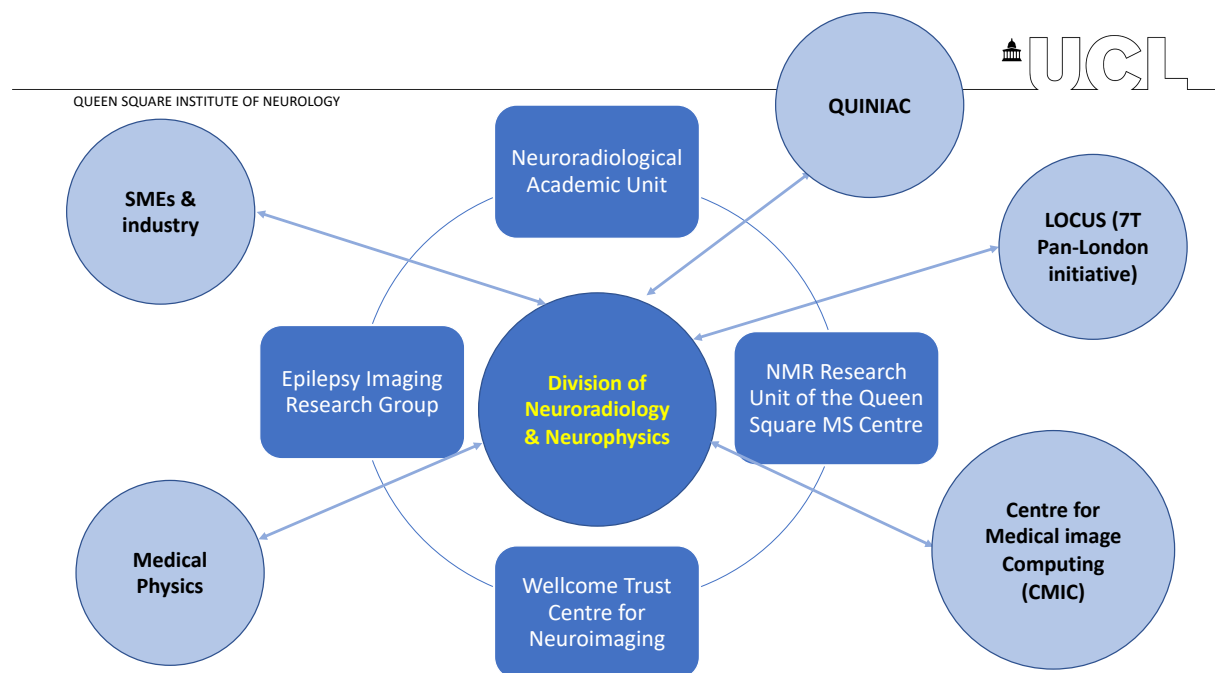
Professor Tarek Yousry  
Professor Claudia Wheeler-Kingshott

## MISSION STATEMENT

*The Division of Neuroradiology and Neurophysics (DNN) promotes academic neuroradiology and neuroimaging physics at Queen Square. Since its inception, its core objectives have been to support its members in all aspects of their professional career, to provide an environment for the academic and clinical members to interact and to ensure an open and constructive engagement between MR groups across the IoN. It therefore functions effectively as a cross-cutting theme spanning activities ranging from basic scientific developments through to clinical implementation.*

**Membership.** The DNN brings together Academic Neuroradiologists, Physicists, Computer Scientists and Radiographers at the UCL Institute of Neurology, and research-oriented Clinical Neuroradiologists, Clinical Scientists and Radiographers at the NHNN.

The imaging groups represented in the Division are: the Neuroradiological Academic Unit, the NMR Research Unit of the Queen Square MS Centre, the Epilepsy Imaging research group and the Wellcome Centre for Human Neuroimaging; furthermore there is representation and involvement of the Faculty of Engineering Centre for Medical Imaging Computing (CMIC).



## STRATEGIC OBJECTIVES

- **Strategic involvement**

The Division provides strategic advice and support exemplified by leading the *IoN MR Review and Recommendations* to the 2017 External Review Panel (2018), developing the rationale for the *GIR Research Infrastructure: Requirement for 3T and 7T MRI* in 2021 and providing strategic depth by reaching across faculties to establish structural links with CMIC and conceiving the Quantitative Neuroradiology Innovation and Adoption Centre (QUINIAC) as a cross-faculty and cross-institution (UCL/UCLH) initiative.

In particular, members of the Division have leadership roles in all existing and planned London-based 7T facilities: the FIL, the London Ultra-high Collaborative Scanner (LOCUS) at St. Thomas's, as well as the GIR MR Facility. Indeed, Profs Callaghan, Golay, Wheeler-Kingshott, Thornton, & Yousry are all involved with either or both 7T scanners.

### **Gray's Inn Road (GIR) MRI facility**

The Division has taken a leading role in the development of the GIR MRI facility, where UCL and UCLH scanners will offer the perfect opportunity to achieve a timely and world-leading translation of novel imaging methods to clinical practice

**Academic Radiography** Building on the existing expertise the GIR facility will offer the perfect opportunity to further expand academic radiography

### **Knowledge Transfer**

Strategically significant has been the early assessment of commercial avenues which led to the launch of 2 spinouts (Gold Standard Phantoms & QS Analytics).

- **Education**

Education has been a central theme of the DNN, including:

1. MSc in Advanced Neuroimaging A complete portfolio is now available, with an increasing number of students (13 in 2008 to 31 in 2021).
2. UK 7T users meeting in London in June 2019, at the time when both London 7Ts were just going through installation and acceptance. A follow-up Clinical 7T meeting is currently being arranged.
3. Deliver Physics short course on Devices and MR Compatibility, developing to be world leading, initiated 2017 & planned again for 2022
4. Expand Applied MR Physics courses to other divisions
5. Establish with the Division of Neuropathology a Brain-cutting course
6. Expand the International Academic Neuroradiological Fellowship programme for overseas Neuroradiologists.

- **Communication and Collaborative Research**

Open and constructive communication has been key to the success of the DNN, enabled through bi-monthly meetings of the Steering Group, Annual Meetings of all members and regular workshops. Successful examples, which we will continue to develop, are

1. Aligned governance structures including MR safety frameworks
2. Harmonised MRI protocols and quality control frameworks, within and external to the Division and FBS across UCLH BRC sites, and aligned with national initiatives such as the Dementias Platform UK.

3. Collaborative research projects based on specific expertise in one team shared with the other teams such as Sodium imaging, & multi-platform multi-parametric mapping (MPM)
4. Provision of neuroradiology and MR Physics support to MRI research groups (Dementia, MS, Neuromuscular, Epilepsy, Neuroscience)

- **Supporting People's career**

Over the years, highlights include the successful promotion of members of the Division to grade 10 professor status, such as Prof Claudia Wheeler-Kingshott, Prof Martina Callaghan and Prof John Thornton, as well as the establishment of new academic and clinical posts, including a) the creation of the 1<sup>st</sup> Academic Clinical Scientist post as a joint appointment between CMIC and the Lysholm Department of Neuroradiology, reflecting a strategic alliance between the faculties of Brain Sciences and Engineering; b) the appointment of Dr David Thomas to a new grade 9 Academic post to the GIR Facility and QUINIAC. These developments are critical to the validation and clinical adoption of new imaging tools.

- **Partnering with QS Divisions**

Neuropathology: The DNN has a long history of collaboration on the level of education and research, the latter focusing on imaging post-mortem tissue. It is planned to develop reciprocal educational activities which will include basics of neuropathology & brain morphology and basic MR physics and clinical imaging.

Neurology, Neurophysiology, Neurosurgery, Neuropsychiatry: Once the above is established the educational framework will be expanded to include all QS Divisions.

The activities and successes of the Division and its leadership in a number of developments, such as the GIR imaging facility, are central to the success of neuroimaging research at Queen Square and the Faculty of Brain Sciences.