

PhD Studentship in Visual Development

University College London

Institute of Ophthalmology, Dept. of Visual Neuroscience

Application Deadline: Late 2010 / early 2011 – to be announced in November 2010.

Applications are invited for a 3-year PhD studentship at UCL commencing in October 2011. The studentship is funded by the UCL Grand Challenge studentship programme, an elite PhD training programme designed to attract those researchers with the highest intellectual and scientific skills. The studentship includes an annual stipend of £18,000, Home/EU tuition fees, and £5,000 p.a. research funds. The studentship is funded by the Special Trustees of Moorfields Eye Hospital, UCL, and the IoO/MEH NIHR Biomedical Research Centre. For details of the scheme, please see <http://www.ucl.ac.uk/slms/courses/research-degrees/ucl-gc> (will be updated with 2011 scheme info in November 2010)

The Project

“New infant vision tests for studying disease mechanisms in inherited retinal dystrophies”.

Gene replacement therapy offers the exciting potential to treat many currently intractable conditions. In the world's first clinical trial of retinal gene replacement therapy, at Moorfields Eye Hospital and the UCL Institute of Ophthalmology, young adults with defects in the gene encoding the RPE65 protein had healthy copies of the missing gene inserted into the cells of the retina. This initial study has shown sight improvement in a blinding inherited disease that is otherwise incurable (see <http://tinyurl.com/iootrial>). A major goal for this and other new treatments to restore vision is to treat much younger patients, who have less advanced disease and so are most likely to benefit. However, accurate assessment of functional vision in young children is a major challenge. The focus of this PhD studentship will be on developing robust new methods for early visual assessment, using these to study structure-function relationships in inherited retinal diseases caused by specific genetic mutations, and evaluating results of ongoing trials of new treatments for young patients such as gene replacement therapy.

The studentship offers the opportunity to join a multidisciplinary research team at the UCL Institute of Ophthalmology, UCL Psychology, and Moorfields Eye Hospital, including experts in vision science, genetics, electrophysiology, and biomedical imaging. It offers a unique opportunity to study development of the visual system from the level of a single genetic mutation to a behavioural visual outcome, while also playing a key role in translational research with important implications for future therapies. The research may focus on:

- Developing new tests using state-of-the art eye-tracking technology for rapid and reliable testing of parameters of retinal and cortical vision in infants, e.g. acuity, contrast sensitivity, photoreceptor function, and sensitivity across the visual field. Major challenges are developing appropriate child-friendly tasks, and developing optimal algorithms for measurement of visual parameters.
- Studying structure-function relationships in the developing visual system by comparing psychophysical data with structural imaging or electrophysiology. For example, maps of visual sensitivity across the retina can be correlated with 3D structural scans of the retina obtained via Optical Coherence Tomography (OCT). Key questions are how structure and function change over time in inherited retinal diseases caused by different genetic mutations, and how they change in response to experimental treatments.
- Studying the extent of plasticity in the developing visual system in light of interventions to restore the function of inactive photoreceptors, potentially documenting new ‘critical periods’ revealed by such treatments with implications for tailoring new treatments to be most effective in the future.

The studentship will be supervised by Dr Marko Nardini at the UCL Institute of Ophthalmology, and by Dr John Wattam-Bell at the UCL Division of Psychology and Language Sciences. The project will also offer opportunities for collaboration with a multidisciplinary team at the UCL Institute of Ophthalmology

and Moorfields Eye Hospital (Profs Tony Moore, Gary Rubin, Robin Ali, and others), and with experts in visual development at UCL and Oxford (Janette Atkinson and Oliver Braddick).

Qualifications

The project will involve co-designing new tests and analyses, and recruiting and testing healthy infants and children, and those with inherited retinal dystrophies. Applicants should have (or expect to obtain) a good first degree in a field related to neuroscience, life sciences, vision science or experimental psychology. Technical aptitude and previous experience of vision research are desirable, as is an aptitude for testing infants and children. As the project is administered through the UCL Grand Challenge scheme, the selection criteria are those for the scheme as a whole. Prospective applicants are encouraged to contact Marko Nardini (m.nardini AT ucl.ac.uk) to discuss their suitability for the studentship.

Enquiries

Prospective applicants are welcome to contact Marko Nardini (m.nardini AT ucl.ac.uk) with any enquiries about this specific project, however enquiries about the studentship programme or the application procedure should be directed to the UCL School of Life and Medical Sciences (<http://www.ucl.ac.uk/slms/courses/research-degrees/ucl-gc>).

How to Apply

A CV, one-page statement and names of two referees are required. Please see <http://www.ucl.ac.uk/slms/courses/research-degrees/ucl-gc> for full details. **The application deadline for this year's round will be late 2010/early 2011, to be announced in November 2010.**