**PhD Scholarship Advertisement**

Fully Funded PhD Scholarship in Gene Therapy and Biomaterials for Spinal Cord Injury

College of Medicine and Nursing Health Science

Applications are invited from suitably qualified candidates for full-time funded PhD scholarship(s) starting in September 2024 affiliated to the College of Medicine, Nursing and Health Sciences at the University of Galway.

**University of Galway**

Located in the vibrant cultural city of Galway in the west of Ireland, the University of Galway has a distinguished reputation for teaching and [research excellence](https://www.universityofgalway.ie/our-research/)

For information on moving to Ireland please see [www.euraxess.ie](http://www.euraxess.ie)

**Detailed Project Description**

This position is funded by Science Foundation Ireland (SFI) and is available from 1st September 2024 for four years. In line with the National Framework for Doctoral education, the successful candidate will participate in a structured PhD education and training programme, providing a well-developed monitoring and mentoring support structure. Funding includes a fixed stipend of €22,000 per year along with payment of fees, and laboratory consumables for up to four years.

This study aims to provide proof of principle for a gene therapy to improve repair and function after Spinal Cord Injury (SCI). Following SCI a glial scar is produced which contains specific proteoglycans that inhibit axon growth and impede regeneration. This project aims to disrupt proteoglycan biosynthesis using short hairpin RNAs (shRNAs) delivered via lentiviral vectors (LV). This disruption will be assessed using in vitro, ex vivo and in vivo models of SCI. In parallel a hydrogel LV delivery system will be optimised to improve LV stability and localisation.

Over the course of this project is anticipated that the Ph.D. student will

1. Culture mammalian cells (cell lines and primary cells).

2. Prepare and test LV to deliver short hairpin RNAs and fluorescent proteins.

3. Assess changes in protein and proteoglycan levels by techniques including Western Blotting, immunocytochemistry, and fluorescence microscopy.

4. Assess functional changes using in vitro, ex vivo and in vivo SCI models.

5. In collaboration with researchers at the Mayo Clinic, develop a hydrogel-based delivery system for LV.

6. Actively participate in research group meetings.

7. Contribute to presentations at scientific meetings and to writing of scientific papers.

8. Contribute to undergraduate and M.Sc student project supervision and laboratory-based teaching. Participate in outreach to school students and the public.

Selected Reading:

Patar, A., Dockery, P., McMahon, S. & Howard, L. Ex vivo rat transected spinal cord slices as a model to assess lentiviral vector delivery of neurotrophin-3 and short hairpin RNA against NG2. Biology (Basel). 9 (3) 54 (2020).

Shortiss, C., Howard, L. & McMahon, S. S. Lentiviral Vectors Delivered with Biomaterials as Therapeutics for Spinal Cord Injury. Cells 10, 2102 (2021).

Abu-Rub, M. T, Newland B., Naughton M., Wang W., McMahon S. and Pandit A. Non-viral xylosyltransferase-1 siRNA delivery as an effective alternative to chondroitinase in an in vitro model of reactive astrocytes. Neuroscience 339, 267–275 (2016).

Bradbury, E. J. & Burnside, E. R. Moving beyond the glial scar for spinal cord repair. Nature Communications vol. 10 (2019).

**Living allowance (Stipend):** €22, 000 per annum, a tax-exempt scholarship award.

**University fees**: Included

**Start date**: September 1st 2024

**Academic Entry Requirements:** A 2:1 degree or equivalent in a biological or biomedical science related topic. Candidates should have a high level of spoken and written English.

**To Apply for the Scholarship:**

Expressions of interest comprising submission of a CV, a covering letter with a statement of personal research interests and the contact details of two referees, to be submitted via e-mail to.

**Contact Name:** Dr Linda Howard

**Contact Email:** linda.howard@universityofgalway.ie

**Application Deadline:** 22/07/2024 at 18:00 Irish time

**Primary Supervisor name** Dr Linda Howard