

Scholarship Project Title	Patient Informed Therapeutic Development for Ophthalmic Diseases of Oxidative Stress
Advert Reference number	WD_2025_15_SPONS
Supervisor(s)	Laurence Fitzhenry (SETU Waterford) Martina Gooney (SETU Waterford) Evan Matthews (SETU Waterford) Marcos Mariano (SETU Waterford) Advisors: Tess Ames (SETU Waterford)
Research Group	Ocular Therapeutics Research Group (OTRG) Pharmaceutical and Molecular Biotechnology Research Centre (PMBRC)
Department /School/Faculty	Department of Science, Faculty of Science and Computing
Duration	48 months
Status: Full-time / part-time	Full Time
Value of the scholarship per year for four years	Stipend to be confirmed, a minimum of €22,500 per annum will apply. Fees of €5,750 per annum
Closing date and time	Tuesday, 30 June 2025 at 4pm Irish Time
Interview date	To be confirmed
PhD commencement date	To be confirmed
<p>Project Key Words: Polymer Synthesis, nanotechnology, ocular drug delivery.</p> <p>Post summary</p> <p>Dry Eye Disease (DED) affects >350m people and is the most common reason that patients visit eye-care providers. Treatments for this chronic disease range from over-the-counter artificial tears to anti-inflammatory medications. However, current treatments are sub-optimal, leaving patients with significant symptoms. As such, DED represents a substantial unmet clinical need and growing societal burden with Health-Related Quality of Life (QOL) Scores similar to those for dialysis treatment. The Ocular Therapeutics Research Group (OTRG) has a strong track record in ocular drug delivery, with focus on the development of nanoparticle-based therapies for DED. Previous studies within the group have demonstrated the potential of lipid-based nanosystems to alleviate disease symptoms in both in vitro and in vivo models. Building on this expertise, the present PhD project aims to explore a new generation of active platforms (i.e. nanozymes), for ocular applications. The project will focus on the design and development of functional formulations capable of reducing oxidative stress associated with dry eye disease. The successful candidate will work at the interface of nanotechnology, polymer sciences, and ocular therapeutics, bridging these scientific aspects with significant</p>	

public and patient involvement, contributing to the development of next-generation, patient-centred eye drop formulations.

Nanozymes, nanomaterials with intrinsic enzyme-like catalytic activity, represent a particularly exciting frontier in this space. Unlike conventional antioxidant therapeutics, which are often limited by poor stability, rapid clearance, and low ocular bioavailability, nanozymes offer the potential for sustained, tunable catalytic activity within the tear film and ocular surface. Their multifunctional nature, combining the structural advantages of nanoparticles with the reactive capabilities of enzymes, positions them as powerful candidates for addressing the oxidative imbalance that underpins DED pathology. This project will investigate the rational design, physicochemical characterisation, and functional evaluation of nanozyme-based formulations tailored for topical ocular delivery.

The successful PhD candidate will be based within SETU's Faculty of Science and Computing, benefiting from access to state-of-the-art facilities in formulation science, advanced materials characterisation, and preclinical ocular research. The project is strongly interdisciplinary in nature, and the candidate will have the opportunity to collaborate with clinical and patient partners, ensuring that research outputs are grounded in real-world therapeutic need. This is an exciting opportunity for a motivated graduate with a background in pharmacy, pharmaceutical sciences, chemistry, materials science, or a related discipline to make a meaningful contribution to a field that directly impacts millions of lives worldwide.

Person specification

The ideal candidate will hold a minimum 2.1 honours degree in Pharmacy, Pharmaceutical Sciences, Chemistry, Materials Science, or a closely related discipline, with a Master's degree considered an advantage. They will have a strong foundation in laboratory-based research and a genuine interest in working at the interface of nanotechnology and therapeutic development. The successful candidate will be a motivated, independent thinker who is comfortable working within a multidisciplinary team and engaging with translational, patient-centred research goals. Excellent written and verbal communication skills, along with a passion for addressing real-world clinical challenges, are essential.

Qualifications

Essential

- Honours Degree (minimum 2:1) in the specific area or related area including: Chemistry, Materials Science, and Pharmaceutical Sciences.

Desirable

- A first-class honours or Master's degree in the above areas

Knowledge & Experience

Essential

- Previous hands-on experience with polymer science, pharmaceutical science and/or nanotechnology.
- Research project carried out in one of the above disciplines.
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Desirable

- A demonstrated knowledge of at least three of the following: organic/polymer synthesis, drug delivery, nanotechnology, materials characterisation, cell culture, ex vivo analysis, microfluidics.
- Work placement/internship undertaken in an industry or research lab related to the above disciplines.
- Prior experience with the use and maintenance of cell culture lines for use in *in vitro* cellular assays.

Skills & Competencies

Essential

- Applicants whose first language is not English must demonstrate on application that they meet [SETU's English language requirements](#) and provide all necessary documentation. See Page 7 of the Code of Practice
- In order to be [shortlisted for interview](#), you must meet the SETU English speaking requirements so please provide evidence in your application.
- Proficiency in the use of Microsoft® Office.
- Skilled in data analysis and interpretation.
- Self-motivation and an ability to demonstrate their own initiative to fulfil the outlined goals of the research project.
- Strong interpersonal and communication skills, with a proven ability to work within multi-disciplinary teams.

Desirable

- Evidence of interest, aptitude and research experience in the above disciplines
If applicable, an IELTS score of 7 or equivalent
- Prior experience in scientific academic writing.
- A working knowledge of statistical analytical software.
- Prior experience in the dissemination scientific knowledge to both small and large interdisciplinary audiences (written or verbal).

Further information

For any informal queries, please contact Dr Laurence Fitzhenry on email Laurence.Fitzhenry@setu.ie

Application procedure

Complete the online Application Form from the [SETU website](#) quoting the advert reference number from above.

Please ensure that you upload all supporting documents as part of your submission.

Please note that applications must be submitted by this route.

For queries relating to the application and admission process please contact the Postgraduate Admissions Office via email researchadmissions@setu.ie or telephone +353 (0)51 302883.
University Website: <https://www.setu.ie>

The University will short-list and interview those applicants who provide the most suitable information in terms of experience, qualifications and other requirements relevant to the scholarship.

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