



Waterford Institute of Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

## ESR Project Information Sheet

<b>Project title</b>	Development of a bioadhesive ocular drug delivery system
<b>Reference number</b>	ORBITAL_ESR_2019_Project 4
<b>Host Institution/University</b>	Waterford Institute of Technology
<b>Supervisor(s)</b>	Helen Hughes (PI), Wayne Cummins, Larry Fitzhenry, Fernando Huete, Vanessa Andrés, Mark Byrne
<b>Research Group</b>	Ocular Therapeutics Research Group (OTRG), PMBRC
<b>Department / School</b>	Department of Science, School of Science and Computing
<b>Duration</b>	36-month employment contract provided and ESR enrolled on 4-year structured PhD. ESR will be required to self-fund after the initial 36 months
<b>Status: Full-time / part-time</b>	Full time
<b>Funding information</b>	Funding agency: H2020-MSCA-ITN-2018
<b>Early Stage Researcher Allowances:</b>	Living allowance: €45,361 p/a + mobility allowance of €7,200 p/a + family allowance where applicable ( <b>all values before tax and social security payments</b> ) Fees: € 4,500 - 6,500 (paid from funding for 36 months)
<b>Closing date and time</b>	5 p.m. (CET) Tuesday 26 <sup>th</sup> November, 2019
<b>Commencement date</b>	Immediate start

### Post summary

There is a clear unmet clinical need for efficient, safe, non-invasive and patient-friendly strategies for the treatment of prevalent diseases of the posterior segment of the eye. With a uniquely qualified, and outstanding collaborative network of European and global experts, from academic, clinical and industrial sectors, the ORBITAL project is an integrated and complementary network of expertise in materials science, nanotechnology, animal modelling, enhanced *in-vitro* testing, *in-vivo* ocular modelling, analytical chemistry and drug discovery. ORBITAL will target the growing challenge of posterior segment diseases (PSD) of the eye, such as Age Related Macular Degeneration (AMD) and Diabetic Retinopathy (DR), by building an intersectoral consortium with extensive experience in generating innovative technologies. This project aims to contribute to these challenges through the development of polymers suitable for the preparation of permeation enhancing nanoparticle-loaded bioadhesive / bioresponsive (such as mucoadhesive) tabs which will then will be studied for their bioadhesion, drug-loading, biodegradability and nanoparticle release capabilities. These polymers will undergo physical and chemical characterisation and a range of materials will be tested for suitability. As part of the network, industrial clinical and medical expertise is available so that drugs to assist in the definition of the target drug release profiles. Secondments to Rowan University, Ocupharm (an industrial placement) and Department of Pharmaceutics at Complutense University of Madrid, in Spain.

The main phases of the research can be summarised as follows:

- Formulation and characterisation of bioadhesive / bioresponsive tabs for incorporation of nanoparticles.

Permeation enhancing nanoparticles will be formulated into a bioadhesive / bioresponsive tab which will encapsulate the specific model drug compounds. Formulations will be designed with components which will give adequate properties to the final formulation to be administered in the eye.

- Safety and efficacy of the novel platforms and nanomaterials.

The resultant formulations will be fully characterised and biological evaluation of these nanomaterials will be carried out on ocular cell lines and cytotoxicity evaluation will be fully determined. Safety profiles will be determined and the sustained and controlled release of the nanoparticles from the bioadhesive / bioresponsive tab evaluated.

### **Standard duties and responsibilities of the ESR**

For the 36 months of employment contract the ESR will be required to work exclusively on the MSCA programme.

**In all cases, all duties and responsibilities will be clearly outlined in the researchers Personal Career Development Plan, as determined in the early stages of the project between the ESR and their supervisory committee.**

### **Person specification**

#### **Qualifications**

Essential

Applicants should hold or expect to attain, as a minimum a 2:1 Honours degree, or equivalent, in Chemistry, Materials Science, Analytical Chemistry, Organic Chemistry, Biomedical Science, Polymer Chemistry, Pharmaceutics or related area.

#### **Knowledge & Experience**

Essential

- Research project carried out in at least one of the above disciplines.
- A demonstrated knowledge of at least three of the following: pharmaceutical formulation development, drug delivery, cell culture/molecular biology, nanotechnology, polymerisation techniques.

Desirable

Work placement undertaken in an industry related to the above disciplines

#### **Skills & Competencies**

Essential

- Applicants whose first language is not English must submit evidence of competency in English, please see [WIT's English Language Requirements](#) for details.
- Evidence of interest, aptitude and research experience in the above disciplines.

### **Further information**

For any informal queries, please contact Dr. Helen Hughes by email at [hhughes@wit.ie](mailto:hhughes@wit.ie)

For queries relating to the application and admission process please contact Dr Laurence Fitzhenry at [orbital@wit.ie](mailto:orbital@wit.ie) or by telephone at +353 (0)51 302624.

Website: [www.orbital-itn.eu](http://www.orbital-itn.eu)

**The Institute may decide to interview only those applicants who appear from the information available, to be the most suitable, in terms of experience, qualifications and other requirements of the position.**



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