Postgraduate Scholarship Information Sheet

Scholarship Project Title	**Biopolymer Approval Platform for Pharmaceutical Primary Packaging**
Advert Reference number	**SETU_2024_222**
Supervisor(s)	Dr Richie Ryan (SETU Waterford Campus) Dr Wayne Cummins (SETU Waterford Campus) Dr Mike Kinsella (SETU Waterford Campus)
Research Group	PMBRC
Department /School/Faculty	Department of Science, Faculty of Science & Computing
Duration	4 Years/48 Months
Status: Full-time / part-time	Full Time
Funding information	SETU 2024 Presidents Scholarship Programme
Value of the scholarship per year for four years	Stipend: €18,500 per annum Fees of €5,750 per annum Research costs- €2,000/€3,000 per annum
Closing date and time	**14 August 2024 at 4pm Irish Time**
Interview date	**To be confirmed**
PhD commencement date	**To be confirmed**

Project Key Words: *Analytical Chemistry, Polymer Characterisation, Drug Formulation*

Post summary

The use of biopolymers in pharmaceutical primary packaging is an attractive alternative to petroleum based polymers, due to their biodegradability and reduced environmental impact. However, potential for extractables and leachables (E&L) from these materials can pose a risk to drug product quality and patient safety.

The project will investigate biopolymer synthesis/modification and develop an analytical platform to enable a regulatory assessment of biopolymers as pharmaceutical primary packaging. E&L studies will be developed for potential packaging materials to identify and quantify any components which may potentially enter the drug formulation from the packaging material in the form of leachables. Sample clean-up protocols will be developed to remove drug product interferents prior to leachable analysis. In tandem with development of analytical methods and appropriate leachate modelling from stability studies, the suitability of biopolymers as pharmaceutical packaging will include material functionality testing (strength, flexibility, moisture diffusion etc.).

The successful candidate will be trained to PhD level in the areas of analytical, synthetic and material chemistry under the overarching discipline of pharmaceutical science. They will gain experience in advanced analytical and sample pre-treatment technologies, allowing them to become an expert in design, extraction and analysis of E&L components. In addition to technical expertise they will also develop transferrable skills necessary to build a career in

industry, academia or both. The student will work within the PMBRC, with a wide range of equipment and expertise available. The student will also collaborate with other members of this group with ongoing related projects and present their work at group team meetings. The project will allow attendance at an international conference for result dissemination and networking. The student will also be required to prepare and submit research papers to high impact international journals as directed by the supervisory team.

Duties and expectations for the selected candidate

The successful candidate will be expected to conduct a combination of literature research and laboratory experimental work and consistently display independent planning and initiative. The research methodology includes:

- Development of methods suited for sample preparation and concentration prior to analysis
- Development of GC-MS and LC-MS analytical methods for leachate analysis.
- Design, synthesis and characterisation of a number of biopolymers in addition to structural modification and chemical functionalisation of existing biopolymers
- Analysis of biopolymers, stability modelling, material functionality testing using a variety of material characterisation techniques
- Complete and write literature review, reports, posters and PhD thesis outlining the research completed and analysing in full the results obtained.
- Presentation of results at conferences, meetings and symposia

Knowledge & Experience

Essential

- Applicants should hold or expect to attain, as a minimum a 2:1 Honours degree, or equivalent, in Chemistry, Analytical Chemistry, Organic Chemistry, Polymer Chemistry, Materials Characterisation or related area.
- Independent Research project carried out in at least one of the above disciplines, as well as practical hands on laboratory experience as core themes in the degree
- A demonstrated knowledge of at least three of the following: sample preparation, analytical method development, polymerisation techniques, materials characterisation, pharmaceutical formulation development, drug delivery

Desirable

- MSc project in the above related disciplines
- Work placement undertaken in an industry related to the above disciplines
- Experience in independent operation of analytical instruments (e.g. HPLC, GC)

Skills & Competencies

Essential

- The applicant must have a high level of self-motivation, be able to think and work independently.
- Good communication skills, motivation to learn, both from peers and independently.
- Excellent scientific writing skills, ability to write for different contexts (e.g. for scientific journals, websites, communicating science to the general public).

- 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.

Desirable

- Knowledge of scientific database searching, literature review writing and good scientific writing skills.
- Experience on the use of chemical drawing software packages and reference management software

Further information
For any informal queries, please contact Dr. Riche Ryan on email richie.j.ryan@setu.ie.

For queries relating to the application and admission process, please contact the Postgraduate Admissions Office researchadmissions@setu.ie or telephone +353 (0)51 302883.

For queries relating to the funding programme, please email scholarships2024@setu.ie

University Website https://www.setu.ie/

Application procedure

Download the Research Postgraduate Application Form from the SETU website and return the completed application to researchadmissions@setu.ie quoting **SETU_2024_222** in the email subject line.

Please note that paper submissions will not be accepted.

The University may decide to interview only those applicants who appear from the information they provided, to be the most suitable in terms of experience, qualifications and other requirements of the post.

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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