



<b>Research Centre</b>	Fraunhofer Project Centre for Embedded Bioanalytical Systems at Dublin City University (FPC@DCU) – a joint initiative of Science Foundation Ireland and Fraunhofer-Gesellschaft
<b>Post title</b>	Postdoctoral Researcher in microfluidic design, development and manufacturing
<b>Level on Framework</b>	Level 1
<b>Post duration</b>	Fixed term until 31 December 2020

### **Research Career Framework**

As part of this role the researcher will be required to participate in the DCU Research Career Framework <http://dcu.ie/hr/ResearchersFramework/index.shtml>. This framework is designed to provide significant professional development opportunities to researchers and offer the best opportunities in terms of a wider career path.

DCU has a strong track record in attracting both Irish and European Union research funding under Horizon 2020 (and all previous Framework Programmes), Marie Curie Actions and Erasmus. We offer a dynamic and internationally-focused environment in which to advance your academic career.

An exciting research position in a very innovative, applied research initiative embedded in Dublin City University – Ireland’s University of Enterprise. The technology-led FPC@DCU engineers next-generation life-science technologies for the benefit of people and societies in collaboration with the Fraunhofer Institute for Production Technology (IPT) in Germany. Common fields of application are in-vitro (“Point-of-Care”) diagnostics, pharma, life-science research, agrifood and environmental monitoring. FPC@DCU therefore operates at the challenging crossroads of microsystems engineering and the life sciences.

### **Background & Role**

You develop microfluidics-based systems towards high technology readiness levels (TRLs) within FPC@DCU in collaboration with the Fraunhofer Institute for Production Technology (IPT) in Germany. Furthermore, you will support the business development and project management teams of the FPC@DCU in their interactions with industry, academia and funding agencies.

## **Principal Duties and Responsibilities**

Reporting to the EVPro project Principal Investigator.

Technical duties will include but will not be limited to:

- Conduct a specified programme of research within the EVPro NMPB H2020 EU Project under the supervision and direction of the project PI.
- Design and development of next generation microfluidic lab on a chip products
- Testing developed prototypes under various conditions and iterating designs towards upscaling for small scale production
- Sourcing components and methods both for prototyping and final iteration of product production
- Support, quality control and testing of developed microfluidic products
- Microfluidic lab on a chip product system integration
- Interaction with project partners on outsourced small scale production processes

Additional duties will include:

- Support of project management, reporting and interactions with partners
- Gain experience and contribute to grant writing with the support of and under the supervision of the Principal Investigator
- Engage in the dissemination of the results of the research in which they are engaged, as directed by, with the support of and under the supervision of the Principal Investigator
- Authoring of scientific publications, technical reports and marketing activities
- Engage in appropriate training and professional development opportunities as required by the Director, FPC@DCU or University in order to develop research skills and competencies.
- Interact closely with postgraduate research students associated with the same research group and possibly have an agreed role in supporting these students in their day to day research in conjunction with an academic supervisor
- Take leadership and contribute to generation of papers, reports and funding proposals.
- Actively publish research findings in high impact journals and at key conferences as part of the FPC@DCU effort to disseminate research outputs.
- Carry out administrative work to support the programme of research where required, including regular funding agency reports and internal reports etc.
- Support collaboration with industry in areas relevant to the FPC@DCU.

The role will involve domestic and international travel.

## **Project Summary: EVPro - Development of Extracellular Vesicles loaded hydrogel coatings with immunomodulatory activity for Promoted Regenerative Osseointegration of revision endoprosthesis**

Revision Endoprosthesis are often associated with post-surgical physical symptoms that can lead to long-term confinement to bed and in severe cases to implant rejection. Severe inflammatory reactions in the endoprosthesis shaft can occur due to a previous long-term prosthesis. Medically managing the inflammation process is challenging as it is difficult to introduce drugs to the site of inflammation after implantation of the revision endoprosthesis. EVPRO overcomes this problem by using human mesenchymal stem/stromal cell derived extracellular vesicles (MSC-EVs) which are known to suppress inflammatory reaction in humans, exert pro-regenerative effects in osteogenic setting and successfully treat patients with steroid-refractory graft-versus-host disease. In this project the MSC-EVs will be applied in direct physical proximity to the site of inflammation and will therefore affix on the implant surface to deliver their anti-inflammatory and regenerative effect in response to the local inflammation status. This will be achieved by safe integration of the MSC-EVs in a smart biodegradable hydrogel that is absorbed into the micropores of a TiO<sub>2</sub> coating on the surface of conventional titan endoprosthesis. EVPRO enables the progression of each individual technology, along with EVPRO system level integration developments, into pre-clinical trials, i.e. i) the development of a GMP conformed large scale production of MSC-EVs, ii) the establishment of an uniform method to purify and select the most potential MSC-EVs with a microfluidic system and iii) the design of a self-regulated hydrogel as protection matrix of MSC-EVs with the function to store and release MSC-EVs in response to the inflammation status.

The EVPRO project is an integration of multidisciplinary post-proof of concept technologies which enables the successful resolution of the enhanced osseointegration of endoprosthesis for osteo-articular tissue regeneration.

### **Minimum Criteria**

Applicants must have a solid technical expertise in microfluidics and have a track record of successful research and development projects and of bringing prototypes from concept to functional products. A background in a subset of the following areas is required:

- A Ph.D., along with an MSc or Bachelor Degree in Mechanical Engineering / Biomedical Engineering or related Engineer/ Science degree
- 3+ Years' Experience designing Microfluidic biochip products
- Solid working knowledge of designing with AutoCAD, SolidWorks, Pro Engineer
- Simulation knowledge with COMSOL, ANSYS, Open FOAM.
- Design, development and system level integration of microfluidic platforms / lab-on-a-chip systems.
- Polymer microfabrication techniques and rapid prototyping methods
- Small series production methods such as injection moulding, hot embossing

**Salary:** \*€37,222 - €43,029

*\*Appointment will be commensurate with qualifications and experience will be made on the appropriate point of the salary scale, in line with current Government pay policy.*

**Closing date:** 8<sup>th</sup> May 2019

**Candidates will be assessed on the following competencies:**

**Discipline specific knowledge and Research Skills** (demonstrates knowledge of a research discipline and the ability to conduct a specific programme of research within that discipline)

**Communicating Research** (Demonstrates the ability to communicate their research with their peers and the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students)

**Managing & Leadership skills** (demonstrates the potential to manage a research project including the supervision of undergraduate students)

**Understanding the Research Environment** (demonstrates an awareness of the research environment( e.g. funding bodies) and takes responsibility for how their research is conducted

**Informal enquiries to:** Dr. Damien King ([Damien.king@dcu.ie](mailto:Damien.king@dcu.ie))

**Application Procedure:**

Application forms are available from the DCU Current Vacancies (Open Competitions) website at <http://www4.dcu.ie/hr/vacancies/current.shtml> and also from the Human Resources Department, Dublin City University, Dublin 9. Tel: +353 (0)1 700 5149; Fax: +353 (0)1 700 5500 Email: [hr.applications@dcu.ie](mailto:hr.applications@dcu.ie)

Applications should be submitted by e-mail to [hr.applications@dcu.ie](mailto:hr.applications@dcu.ie) or by Fax: +353 (0)1 700 5500 or by post to the Human Resources Department, Dublin City University, Dublin 9.

**Please clearly state the role that you are applying for in your application and email subject**

**line: Job Ref#RF1208 Postdoctoral Researcher**

*Dublin City University is an equal opportunities employer*