



Research Centre	Fraunhofer Project Centre for Embedded Bioanalytical Systems at Dublin City University (FPC@DCU) – a joint initiative of Science Foundation Ireland and Fraunhofer-Gesellschaft
Post title	Research Assistant in microfluidic design, development and manufacturing
Post duration	Fixed term until 28 February 2020

Background & Role

To develop microfluidics-based systems towards high technology readiness levels (TRLs) within the Fraunhofer Project Centre (FPC) for Embedded Bioanalytical Systems planned to be established at Dublin City University (DCU) in collaboration with the Fraunhofer Institute for Production Technology (IPT) in Germany. The FPC@DCU operates at the challenging crossroads of microsystems engineering and the life sciences. Common fields of application are in-vitro (“Point-of-Care”) diagnostics, pharma, life-science research, agrifood and environmental monitoring. Furthermore, you will support the business development and project management teams of the FPC in their interactions with industry, academia and funding agencies.

Project Summary: μ PAT – Microfluidic Process Analysis Technology for Streamlined Upstream Bioprocess Monitoring

The Lab-in-a-Trench chip and optical reader platform is a process analytical technology (PAT) solution for upstream bioprocess monitoring and optimisation which we intend to exploit initially for cell media screening. At the upstream process stage, cell line, media and culture parameters can all be optimised to produce a quality high-yield product, prior to bioreactor production scale-up. This is a stage in the production process where appropriate PAT solutions can mitigate risk and improve product quality. Chinese hamster ovary (CHO) cells have served the biopharmaceutical industry for the past three decades. These are initially grown in shaker and / or spinner flasks, requiring two to four weeks growth time, prior to transfer to controlled bioreactors that in turn provide seed culture for the production scale bioreactor. There is a significant opportunity for a rapid PAT solution that samples low volumes of cells and culture media at the flask growth stage in order to optimise cell line, media and culture parameters. This will reduce man hours and costs subsequent to upscaling to bioreactor CHO cell growth.

We will target this stage in the production process, focusing on cell media screening as a lead application. The microfluidic “Lab-in-a-Trench” platform is based on gravity driven, high-efficiency sedimentation and retention of cells within a trench at the bottom of a flow channel. The cells may then be exposed to a series of conditions (e.g., cell media configurations, additional reagents) that diffuse from the main channel to interact with the trapped cells. The cells can be monitored in real time at single cell resolution, acting as reporter elements to assay the quality of various cell media formulations and batches. In addition, the cells can also be screened for stability, growth kinetics, and expression yields, along with being utilised in sequential experiments for at-line process monitoring purposes.

Principal Duties and Responsibilities

Reporting to the MicroPAT project PI. Technical duties will include but will not be limited to:

- Conduct a specified programme of research within the MicroPAT Enterprise Ireland Commercialisation Fund 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
- 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
- Support collaboration with industry in areas relevant to the pos@DCU.

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:

- An MEng or Bachelor Degree in Mechanical Engineering/ Biomedical Engineering or related Engineer/ Science degree
- 1+ Years' Experience designing Microfluidic biochip products
- Solid working knowledge of designing with AutoCAD, SolidWorks and COMSOL / Open FOAM.
- Design, development and system level integration of microfluidic platforms/lab-on-a-chip systems.
- Polymer microfabrication techniques and rapid prototyping.
- Small series production methods such as injection moulding

Salary: *€26,245 - €30,393

**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: 10th June 2019

Informal enquiries to: Dr. Damien King - Research Fellow, Fraunhofer Project Centre for Embedded Bioanalytical Systems at Dublin City University (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

Applications should be submitted by e-mail to 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 #RF1226 Research Assistant in microfluidic design, development and manufacturing

Dublin City University is an equal opportunities employer