Job Description

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<tr>
<th>College/Management Unit</th>
<th>Faculty of Engineering, Mathematics and Science</th>
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<tr>
<td>School/Unit</td>
<td>Botany Department, School of Natural Science</td>
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<tr>
<td>Post Title</td>
<td>Post-doctoral Research Fellow</td>
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<td>Project</td>
<td>ERC Proof of Concept - PlantSenseKit</td>
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<td>Post Duration</td>
<td>12 months, Starting November 2017</td>
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<td>Reports to</td>
<td>Professor Jennifer McElwain</td>
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Position Summary

Project Summary

To date, no commercial product has been developed which tests standardization of environmental conditions within and between Controlled Environment Chambers (CECs) of the same manufacturer or between different manufacturers. Currently, each environmental parameter within CECs (e.g. temperature, humidity, light intensity) is monitored by the deployment of a single artificial sensor per CEC. Our ERC StG research1 (Porter et al., 2015) has demonstrated that whole networks of artificial sensors, costing thousands of euros per CEC, are required to ensure environmental homogeneity within and between CECs, which represents a prohibitive cost to research and industry. This Proof of Concept (PoC) grant will develop and commercialize the first plant-based sensor kit for standardization and calibration of CECs used in plant research, commercial horticulture and the international plant breeding sector globally (Syngenta, Monsanto, Bayer) bringing down the cost of testing environmental homogeneity within and between CECs by an order of magnitude. This is an advanced research focused role, building on your prior experience as a post-doctoral fellow, where you will conduct a specified programme of research supported by research training under the supervision and direction of a Principal Investigator.

Simply stated, plants are better sensors than any manufactured artificial sensors currently available on the market. The challenge and aim of this PoC is to quantify and calibrate the ‘biosensor’ capacity of plants and to develop an easy-to-use tool using plants as sensors for the standardization and calibration of CECs.

In addition to the Principal Duties and Responsibilities listed below, the successful candidate will also carry out the following duties specific to this project:

- Contribute to market research (product competitive analysis, customer/user questionnaires, and a full formal market analysis
- Collaborate on packaging/marketing of PlantSenseKit prototype with the design lab at the National College of Art and Design (NCAD) Dublin
- Design packaging for prototype consumables including boxes, nutrients, soil media, aerators, pumps for the aeroponic and hydroponic systems, seeds of *Vicia faba*
- Liaising with CEC users and manufacturers to further define the economic and research costs associated with ‘chamber effects’
- Work with NovaUCD to develop and implement a pre-commercialization plan for PlantSenseKit
- Contribute to the patenting and licensing processes
- Work closely with NovaUCD on an intellectual property position and strategy throughout the project
- Conduct cost-benefit analysis for the development of a spin-out company for PlantSenseKit
- Responsible for accurately communicating the progress of the project to PI and industry partners
- Actively engage with potential investors, industrial partners, and licensing companies in parallel with the final optimization of the PlantSenseKit prototype
- Attend weekly lab meeting

**Salary:** €35,488 - €46,255 per annum
Appointment on the above range will be dependent on qualifications and experience

**Principal Duties and Responsibilities**

- Conduct a specified programme of research and scholarship under the supervision and direction of your Principal Investigator.
- Engage in appropriate training and professional development opportunities as required by your Principal Investigator, your School or Institute, or the University.
- Support your Principal Investigator and research group in the design and development of the research programme.
- Engage in the dissemination of the results of the research in which you are engaged as directed by and with the support of and under the supervision of your Principal Investigator.
- Engage in the wider research and scholarly activities of your research group, School and Institute.
- Take responsibility as requested for day-to-day advice and support of graduate research students associated with your research group.
- Mentor and assist, as appropriate and as directed, the research graduate students in your group, School and Institute.
- Carry out administrative and management work associated with your programme of research.

**Selection Criteria**
Selection criteria outline the qualifications, skills, knowledge and/or experience that the successful candidate would need to demonstrate for successful discharge of the responsibilities of the post. Applications will be assessed on the basis of how well candidates satisfy these criteria.
Mandatory Prerequisites

- PhD in Engineering, Design, Arts or Business with a focus on product design, development and manufacturing
- Experience in product design and manufacturing
- Experience in conducting and analyzing questionnaires and interviews
- Demonstrated understanding of operational requirements for a successful research project and managing resources
- Knowledge and application of the principles underpinning successful grant application
- Ability to identify and fulfil the academic writing requirements for target publications
- Proven record of working with team members and PhD students to help build their research skill and knowledge and to support and guide their professional development
- Generates new ideas and links and builds upon existing ideas to generate unique concepts and solutions
- Demonstrated experience of a working laboratory environment
- Ability to troubleshoot
- Willingness to learn wide range of new skills

Desirable Prerequisites

- Understanding of market economics and the market potential of new products
- Experience in designing product labels
- Experience with liaising and collaborating with industry representatives
- Horticultural/Plant Sciences knowledge/background
- Familiarity with plant growth chambers
- Demonstrated understanding of the value of academic and commercial information e.g. Non-disclosure agreements
- Knowledge of IP processes and knows how to protect findings
Further Information for Candidates

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<th>The University:</th>
<th><a href="http://www.tcd.ie/">http://www.tcd.ie/</a></th>
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<td>The College/Management Unit:</td>
<td><a href="http://www.naturalscience.tcd.ie/">http://www.naturalscience.tcd.ie/</a></td>
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Please send CV and Cover Letter to:
Name: Jennifer McElwain
Title: Professor
Email address: Jennifer.mcelwain@gmail.com
Email Subject: ERC Proof of Concept – Post Doctoral Applicant – Business and Design

**Application Closing Date:** 5:00 pm (IST) on October 6th, 2017

Please note that reallocation expenses will not be covered