



## **A new technological platform for personalised cell therapy**

Theme: Infection, Immunity & Repair

Reference: MRC19IIRBa Di Lorenzo

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Personalised and advanced therapeutics have the potential to transform the precision of healthcare interventions. For this potential to be realised, however, novel approaches to personalised therapeutic manufacture are required to overcome significant economic and technological challenges. Current manufacturing systems are designed with the 'one-size-fits-all' approach, which is not suitable for patient-specific healthcare applications. Our long-term vision is to redefine the manufacture of cell-based therapeutics through the development of a self-regulated on-body micro-manufacturing and processing facility.

With this focus in mind, we propose a highly interdisciplinary PhD project, which, by combining engineering with life science, material chemistry mathematics and physics, will develop an innovative bioelectronic device for cell culturing with integrated sensing capability. We will employ the T lymphocyte cell (T-cell) immunotherapy application as an exemplar. This choice was made given the promising curative potential of T-cells for some of the most aggressive forms of cancer, including Acute Lymphoblastic Leukaemia. Electrochemical monitoring and control of T-cell growth and proliferation in the bioelectronics device will be achieved. Also, the T-cells culturing will be automatized by using a closed-loop control algorithm approach.

In conclusion, this PhD project will lead to the development of an innovative engineering system to ensure robust, reproducible and consistent manufacturing of T-cells, minimise the risk of failure and ultimately facilitate personalised therapeutics.

**IMPORTANT:** In order to apply for this project, you should apply using the DTP's online application form: <https://cardiff.onlinesurveys.ac.uk/gw4-biomed-mrc-dtp-student-2019>

More information on the application process may be found here:

<http://www.gw4biomed.ac.uk/doctoral-students/>

**APPLICATIONS OPEN ON 24 SEPTEMBER AND CLOSE ON 23 NOVEMBER 2018.**

You do NOT need to apply to the University of Bath at this stage – only those applicants who are successful in obtaining an offer of funding from the DTP will be required to submit an application to study at Bath.