



Development of a multiplex sensing platform for accurate and rapid diagnosis of sepsis

Theme: Infection, Immunity & Repair

Reference: MRC19IIRBa Estrela

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Sepsis is “a life threatening condition that arises when the body's response to an infection injures its own tissues and organs”. Striking with equal ferocity in both the developed and developing worlds, sepsis kills one person every few seconds. In the UK alone, it kills more people than breast, bowel and prostate cancer combined.

Unfortunately, clinical symptoms, such as raised temperature, increased pulse or breathing rate, and current laboratory diagnostics, such as white blood cell count or bacterial culture are relatively non-specific and lack the sensitivity necessary for a definitive early diagnosis. **There is a critical and unmet clinical need** to develop diagnostic technologies capable of rapidly and accurately diagnosing sepsis. For every hour delay in diagnosis, the risk of death increases by 6-10%.

Researchers at the Universities of Bath and Cardiff have jointly developed exciting new approaches for the detection of disease associated biomarkers. Using carefully designed synthetic recognition systems coupled with simple, yet elegant, electrochemical sensing approaches, we have demonstrated the ability to detect biomarkers in clinical samples with excellent sensitivity and selectivity. **Critically, such an approach can be easily transformed into a low-cost, small-footprint biosensing platform meaning it can be deployed in near-patient / point-of-care settings.** This project will focus on the development of a multiplex sensing platform that will detect both pathogen associated and host immune markers of sepsis. This will address the critical need for a rapid and accurate sepsis diagnosis tool.

The project is very inter-disciplinary in nature. Consequently the successful student will be supported in the development and acquisition of a range of skills throughout their PhD e.g. biosensor development, surface & polymer chemistry, bioassay design, microfluidics, electronic integration. The student will be based at the innovative Centre for Biosensors, Bioelectronics and Biodevices (C3Bio) at Bath, however they will spend extended research and training periods in Cardiff where they will also work closely with clinicians to ensure that the diagnostic developed is fit-for-purpose. On completion of this project, the student will be equipped with a unique set of interdisciplinary skills that will make them a highly employable scientist across a range of sectors.

IMPORTANT: In order to apply for this project, you should apply using the DTP's online application form. More information on the application process may be found here:

<https://cardiff.onlinesurveys.ac.uk/gw4-biomed-mrc-dtp-student-2019>

APPLICATIONS OPEN ON 24 SEPTEMBER AND CLOSE AT 17:00 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.