

Case Study

RAPID SUSTAINABLE DIAGNOSTICS

Supporting researchers to tackle global issues associated with biofilms

Loughborough University based biotechnology start-up, Cromerix, is working to tackle the growing global issues in healthcare, industry and home, due to microbial infections and contaminations, which have an economic impact of \$5 trillion per annum associated with biofilms, and an estimated annual burden of >\$1 trillion by 2050 for antimicrobial resistance. The start-up currently specialises in aptamer-based products that can deliver rapid sustainable diagnostic solutions, which has a global market size of ~\$5 billion. These aptamer-based techniques are transferrable to engineering biology applications that have an estimated global economic impact of \$4 trillion in the next 10-20 years. Dr Sourav Ghosh, Director at Cromerix and Senior Lecturer at Loughborough University, said,

“We received an NBIC Flexible Talent Mobility Award (FTMA) worth £20k, which was crucial in piloting research activities and intellectual property build-up”.

The initial concepts developed from this project supported the win of a Fast Start Innovate UK grant worth £50k, which further helped in proving the feasibility of Cromerix’s single-step microbial detection technology. The growing technology evidence also helped the start-up win industry funding in fuel contamination measurement. Additionally, NBIC extended vital help in connecting with potential customers, some of whom are continuing to engage with Cromerix around funding future development against a possible licensing agreement.

Cromerix’s diagnostic programme can deliver the world’s fastest definitive microbial test that informs both infection/contamination and antimicrobial selection. This is the first specific test having a broad microbial coverage, but can be designed to be species-specific where needed. The intrinsic speed, ease of use,

and low cost and carbon footprint of the test promises its sustainability and adoptability widely across clinical and non-clinical sectors for early diagnosis and intervention, transforming care/product quality and costs.

Cromerix has demonstrated rapid broad bacterial detection (gram-negative and gram-positive) and antibiotic sensitivity testing using a single-step aptamer-based fluorescence-switch assay. It has also designed concepts for microbial viability detection, equipment-free colorimetric detection, and a method and aptamer for engineering a human microbiome-specific bacterial metabolic activity. The start-up has engaged customer interests in the fields of wound infection diagnostics, and contamination in fuel, and pharmaceutical and personal care products manufacturing sectors. Their findings on diagnostic and engineering biology programmes have significant potential impact across a broad range of clinical and non-clinical sectors, including industry, home, defence, space, and environment.

With support from Alderley Park, the Innovate UK Microbials Accelerators, and Innovate UK Edge, Cromerix is working with experts to build an IP and regulatory strategy.

To support the core technology development and application-specific validations, Cromerix is actively seeking grant, industry and private funding, industry and clinical collaborators and commercial advisors in the space of microbial diagnostics (clinical and non-clinical), antimicrobial resistance, microbiome, and engineering biology.



Aptamer – a uniquely folded short single-stranded DNA/RNA at the heart of Cromerix’s technology (an artistic view).



Dr Sourav Ghosh

Dr Sourav Ghosh is a Senior Lecturer at Loughborough University, leading biosensors research for over 10 years. He has supervised 8 PhDs and 5 postdocs, and won UK/ EU research and enterprise grants worth over £2m. He post-graduated in biomedical engineering from the University of Oxford and studied for his PhD and postdoc at the University of Cambridge. Currently, he is delivering impact from his biotechnology research as the Director of Cromerix, a start-up based at Loughborough University.