Northumbria University NEWCASTLE

Dr Graeme Turnbull, Professor John Dean and Professor Stephen Stanforth from the Department of Applied Sciences

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University and business partnership wins award for improving healthcare

A team of scientists led by Northumbria University has won a Royal Society of Chemistry (RSC) award for improving global healthcare through the discovery of novel approaches for identifying bacteria.

The Bacteria Detection team, which consists of scientists from the universities of Northumbria and Sunderland, the Freeman Hospital (Newcastle upon Tyne Hospitals NHS Foundation Trust) and global biotech firm bioMérieux, has received the RSC's Analytical Division Horizon Prize

2022 for designing compounds that rapidly detect and identify pathogenic bacteria so that treatments can be administered quickly and effectively.

They join a prestigious list of past-winners in the Royal Society of Chemistry's prize portfolio, of which 50 individuals have gone on to win Nobel Prizes for their work, including including 2016 Nobel laureates Jean-Pierre Sauvage, Fraser Stoddart and Ben Feringa.

With more than 30 years' experience in the field of microbial diagnostics, research findings from the team have driven innovation and influenced practice across the healthcare, food, cosmetic and pharmaceutical industries.

By using enzymes related to pathogenic and food-borne bacteria, they have designed compounds which make it easier to detect potentially harmful bacteria. The compounds produce either a colour, fluorescence or release a volatile organic compound when exposed to bacteria, making it easier for healthcare professionals to treat patients quickly and effectively, reducing the cost burden on the NHS.

The reagents are now also being applied to the monitoring and prevention of antimicrobial resistance around the world and have been incorporated into commercial systems sold in more than 100 countries worldwide by bioMérieux.

More than 16 patents and 30 peer-reviewed journal articles have resulted from this programme of work, and it has funded 15 PhD students and post-doctoral research assistants who have formed useful partnerships with industry, the NHS and bioMérieux.

John Dean, Professor of Analytical and Environmental Sciences in Northumbria University's Department of Applied Sciences, is a member of the group and has worked on studies with the partners for several years.

He said: "For the academic team members, present and past, the opportunity to work with both the Freeman Hospital and bioMérieux to investigate new and novel methods for the detection and differentiation of microorganisms within both clinical and food microbiology laboratories, has been transformational in terms of our outlook on our research and its impact on global healthcare.

“This is an excellent example of how universities and industries can work together to create innovative solutions to everyday problems, and we are absolutely delighted that the quality of our work has been recognised by our peers at the Royal Society of Chemistry.”

Dr Helen Pain, Chief Executive of the Royal Society of Chemistry, said: “Some of the most incredible work in chemical science is carried out by teams and collaborations who use their diversity of thought, experience and skills to deliver astonishing results. These synergies are often at the very forefront of expanding our understanding of the world around us, and why our judges have such a difficult job selecting winners for our Horizon Prizes.

“Although we are in the midst of negotiating a particularly turbulent and challenging era, it is important to celebrate successes and advances in understanding as genuine opportunities to improve our lives. The work of the Bacteria Detection team is a fantastic example of why we celebrate great science; and we’re very proud to recognise their contribution today.”

John Perry, Visiting Professor at Northumbria University, and Clinical Scientist at Newcastle upon Tyne Hospitals NHS Foundation Trust said:“From the viewpoint of the clinical laboratory, we have seen several times how a novel enzyme substrate synthesized, for example, at Northumbria University, can be exploited to develop a novel diagnostic method. When such products are ultimately sold around the world and become utilized in numerous published scientific studies, this provides a great deal of satisfaction and motivation for current and future projects. This is only possible through the unique long-term collaboration we have managed to establish and sustain.”

Dr Sylvain Orenga, Research Fellow at bioMérieux, said: “By actively collaborating with the Northumbria University, the University of Sunderland, and the Freeman Hospital, bioMérieux stays at the forefront of new metabolic substrate innovation. Such molecules may be incorporated in some of our *in vitro* diagnostic solution especially for the screening and diagnosis of multi-drug resistance infections. This long-term partnership strongly instils a mindset of open innovation, fuelled by creative and dynamic interactions between all members, enhancing our comprehension of a wide range of areas, from chemistry to the needs and expectations of clinical customers.”

Dr Mark Gray, Senior Lecturer in Medicinal Chemistry at the University of Sunderland, says: “We are delighted to receive this award for our

collaborative work on the diagnosis of bacterial infections and hope this highlights that the antibiotics we already have are a precious resource.

“We have lived through an era where infections, that would have been deadly in previous times, have largely been dealt with by a short course of antibiotics. Unfortunately, this is no longer the case. The bacteria that cause these infections are constantly evolving, and the infections they produce are becoming increasingly hard to treat.

“What most people do not yet know is that recent projections state that by 2050 they will be more likely to die from a bacterial infection than from cancer; we hope that our work in this area will help to minimise these deaths.”

Northumbria is renowned for its outstanding research in the field of allied health, which is now ranked eighth in the UK for research power in the Research Excellence Framework (REF2021). Almost all of Northumbria’s research in this area is rated world-leading or internationally excellent.

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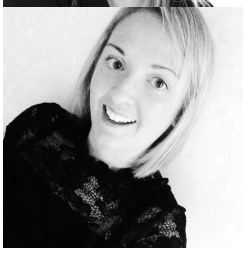

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