



ROYAL
ACADEMY OF
ENGINEERING

Industry-Academia Partnership Programme



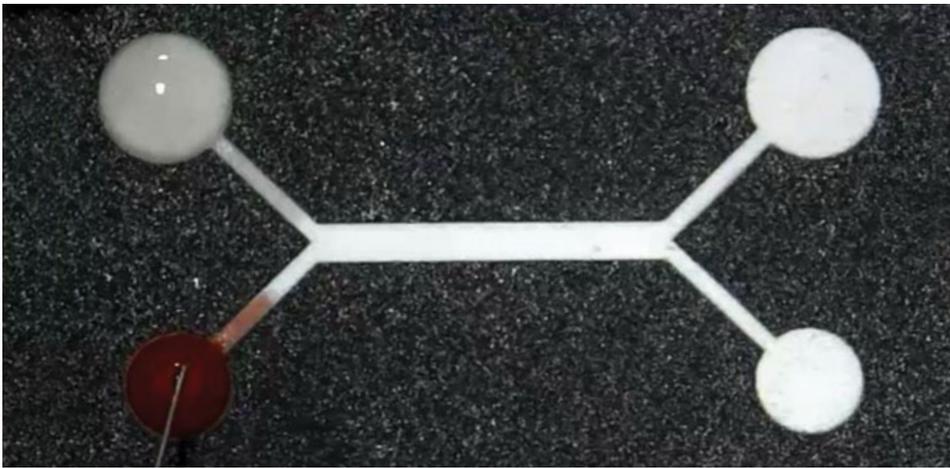
INDIA

Under its remit as a delivery partner of the Newton Fund, the Royal Academy of Engineering has partnered with the Federation of Indian Chambers of Commerce and Industry to enhance engineering teaching, research and innovation outcomes in Indian Tier 2 and Tier 3 universities by building bilateral industry-academia links.

Centre of excellence in research and training for developing low-cost medical diagnostic devices is one of the projects funded through this scheme. It brings together partners from the Indian Institute of Technology (IIT) Kharagpur, the University of Southampton and a startup, Achira Labs, India.



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BUILDING COLLABORATIVE PARTNERSHIPS

Improving point-of-care diagnostics is essential for integrated healthcare, especially in developing countries. Professor Suman Chakraborty, IIT Kharagpur, identified the Industry-Academia Partnership Programme as an opportunity to build a cross-disciplinary team to take on this challenge. Previous collaborators at the University of Southampton were keen to support a project that built on their complementary skills.

Achira Labs was identified as the ideal industry partner to help with achieving the project's aims. "Achira Labs had relevant expertise and experience of developing several niche products," Professor Chakraborty explains. "As a startup they readily engaged with the continuous modification processes needed to move from a functional laboratory prototype to a commercialised product."

IMPACT AND INNOVATION

Current diagnostic tools are limited in meeting the specific healthcare needs of developing areas and can be inaccessible to rural populations. This project aimed to develop alternative, affordable diagnostic tools and protocols for rapid, on-the-spot diagnostics to support early detection of disease and more efficient and effective treatments.

The team has developed new devices and prototypes that operate using a single drop of blood. One of the products comprises a simple paper cartridge integrated with a smartphone-type device for rapid testing of biological samples. The device has low manufacturing costs, is capable of detecting multiple diseases and functions efficiently in settings where resources are limited. A spin-out company has been created to commercialise the device.

MODELS OF ENGAGEMENT

The partnership has helped with fostering engineering skills for translation and delivering learning opportunities such as industry internships for students.

"Researchers can visit our laboratories when needed and we also engage with students at partnership events to give them a view of microfluidics in industry," explains Dr Dhananjaya Dendukuri, CEO and Co-Founder, Achira Labs.

"An important aspect of this project has been to train students in cutting-edge interdisciplinary research," explains Professor Chakraborty. "We particularly wanted to share expertise about inexpensive technologies for affordable diagnostics with students at Tier 2 and Tier 3 level universities."

The partnership plans to achieve this is by developing teaching materials, including a laboratory video, to demonstrate theoretical concepts to inspire and engage students at other universities. They also organised a seminar to share academic outcomes, including industry demonstrations of the working prototype.

Industry has also benefited from the partnership. "It has helped with building our company's international reputation and provided opportunities to build collaborative networks with other academic researchers in this field," says Dr Dendukuri, Achira Labs.

FUTURE PLANS

Along with developing commercialisation plans as part of the spin-out, additional partnerships are being established with industry and other key stakeholders. "We are working closely with small-scale startups and

PROJECT HIGHLIGHTS



11 Undergraduate students trained



1 Spin-out company

local hospitals to validate our device, perform field trials and prepare for commercialisation," Professor Chakraborty highlights.

"Engaging with academia helps to bring cutting-edge research that has been completed to a proof-of-concept level into industrial practice. It's not always possible for companies to engage in risky research projects, so we rely on our academic collaborators for this."

Dr Dhananjaya Dendukuri,
CEO and Co-founder, Achira Labs.

UK-INDIA INDUSTRY-ACADEMIA PARTNERSHIP

As a Newton Fund delivery partner, the Royal Academy of Engineering has partnered with the Federation of Indian Chambers of Commerce and Industry to co-fund awards that strengthen capacity and develop capabilities within Indian Tier 2 and Tier 3 engineering higher education and research institutions to carry out excellent teaching, research and innovation-related activities through collaboration with industry and UK counterparts.

NEWTON FUND

This project is supported by the Newton Fund, which is part of the UK's official development assistance (ODA) and promotes economic development and social welfare by strengthening science and innovation capacity.

For more information

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Image: Blood testing on a simple paper strip © Professor Suman Chakraborty.