Northumbria University NEWCASTLE

Design Engineer Saqib Ali and Dr Sterghios Moschos look at a prototype of the innovative breath collecting device

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# Northumbria professor develops breath collecting device that could change Coronavirus diagnosis around the world

**An innovative breath collecting device developed by academics at Northumbria University, Newcastle, could revolutionise the way we diagnose diseases, such as the newly emerged strain of coronavirus, COVID-19.**

Northumbria University secured regional support and funding for the next stage of product and business development of technology which enables diagnosis of disease through breath collection.

Research shows that our breath contains valuable biological information, also known as biomarkers, that can indicate health and disease. Biomarkers such as DNA, RNA, proteins, and lipids found in the breath have diagnostic potential for diseases of the lung and beyond.

The new device allows sampling of the lung in a non-invasive way - by patients breathing into it - to retrieve these biomarkers.

To date, systems that diagnose from breath sampling have not proven to be reliable enough due to contamination, sample loss and variability issues in breath analysis. However, the new device resolves these issues so that the data collected through this pioneering invention closely resembles results from lung samples taken surgically.

It is hoped that in the future the technology could be used in the diagnosis of lung diseases as well as other health issues such as diabetes, cancers, liver problems, brain and ageing diseases.

Research and development of this technology was led by Dr Sterghios Moschos, Associate Professor at Northumbria University whilst at Westminster University, and has been progressed further whilst at Northumbria University.

Dr Moschos explains: “Our ambition is to reduce the need for bloodletting for diagnosis in its broadest sense. The research evidence that shows this is possible is well established, what is missing is the standardised and reliable approach to do so outside the research lab: in pharmacies, GP surgeries or the back of an ambulance, for example.

“In the case of Coronavirus, temperature monitoring in airports is not sufficient. The World Health Organisation currently recommends testing nasal swabs, oral swabs and swabs from inside the lungs to avoid missing the infection. That’s why it’s vital that we develop non-invasive, quick and cost-effective methods of diagnosis and screening.”

Development of the breath collecting device has been greatly supported by funding from Northern Accelerator, which made it possible to bring together a team to create a functioning prototype of the device. Northumbria graduate Saqib Ali, has been appointed as a Design Engineer for the project and has

carried out the rapid prototyping of the innovative device using 3D printers within the University's engineering labs.

Dr Tim Hammond, Project Lead for the multi-university research commercialisation programme, Northern Accelerator, said: "Dr Moschos' technology is exactly the kind of project Northern Accelerator sets out to progress. Our pre-incorporation funding, along with a range of other support, helps academics turn their promising ideas and world-class research into real world impact. This device does exactly that – with our support it's developing from an idea, to a prototype, to a business that will impact healthcare around the world, as well as increasing R&D expenditure and creating jobs here in the North East."

The project has also been supported by North by Northwest partner's "Innovation to the Commercialisation of University Research (ICURe)" programme. ICURe support enabled the team to get out of the lab and speak to 144 key opinion leaders in breath diagnostics in the US and EU. These conversations helped find a market for their technology and develop a plan to take the technology out of the University.

North by Northwest partners, Head of Innovation, Dr Paul Donachy said "NxNW is a community of innovators, entrepreneurs and investors helping accelerate the commercialisation of University research in the North of England, Scotland and Ireland. The InnovateUK funded ICURe programme is a vital resource in helping University teams validate their early-stage technology in the market. It is a pleasure working with such an ambitious team behind the breath sampling device and we look forward to working with them in future as they bring their platform to market."

The primary interest for the breath sampling device lies in human healthcare, but other opportunities exist in other industries such as veterinary medicine, biosecurity, agritech and food processing.

Professor George Marston, Pro Vice-Chancellor (Research and Innovation) at Northumbria University, said: "The team have ambitions for this technology to replace invasive venous and respiratory sampling tests where possible, particularly for older and younger patients where needles and invasive tests can be uncomfortable or sometimes not possible. We need new medical technologies that help to quickly and easily diagnose disease and monitor health, and this device is one of those technologies. Sterghios and his team,

along with our fantastic partners, have the skills and experience to take this technology to market, resulting in huge impact on healthcare globally in the coming years."

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**Notes to editors**

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To request and check the availability of our experts or for any other media enquiries please contact our Media and Communications team on +44 (0)191 227 4604 or email media.communications@northumbria.ac.uk.

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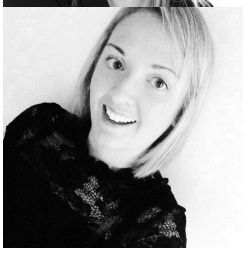

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