

New device detects deadly lung disease

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The lateral-flow device (LFD) detects invasive pulmonary aspergillosis, a notoriously difficult to diagnose disease caused by the fungus *Aspergillus*. Credit: University of Exeter

A scientist from the University of Exeter has developed a simple, cheap and highly accurate device for diagnosing a frequently fatal lung disease which attacks immune deficient individuals such as cancer patients and bone marrow transplant recipients.

The lateral-flow device (LFD), created by Professor Chris Thornton, detects invasive pulmonary aspergillosis, a notoriously difficult to diagnose disease caused by the fungus *Aspergillus*.

Invasive aspergillosis is a leading cause of death in [acute leukaemia](#) and [bone marrow transplant](#) patients, accounting for more than 200,000 life-threatening infections each year, with an associated mortality rate of up to 90%.

The new device – which resembles a pregnancy test but uses a small blood sample – will cost health authorities just £10 per test and will fit into routine hospital practices. It will potentially reduce the high rates of mortality and morbidity associated with the disease and enable better use of costly

and toxic antifungal drugs.

Professor Thornton, of Biosciences, said:

"Individuals with invasive [pulmonary aspergillosis](#) are often suffering from complex medical conditions and the symptoms, which include raised temperature, breathlessness, chest pain and fatigue, could be attributable to a number of other conditions. At present, it can take several days to identify the disease correctly due to the lack of accurate diagnostic tests, and the patient's health deteriorates significantly in the absence of appropriate treatment.

"The low cost, speed, ease-of-use and compatibility of the new device with standard hospital procedures means that the disease can be quickly and accurately monitored at the point-of-care using a simple blood test or with fluids collected during lung biopsy."

Professor Thornton and colleagues have published a number of clinical studies with hospitals in London, Germany, Austria and elsewhere in mainland Europe.

There is also an ongoing trial with leukaemia patients at the Royal Devon and Exeter Hospital under the care of Consultant Haematologist Dr Paul Kerr. He said: "We at the Exeter Leukaemia Unit are very proud to work with Dr Thornton and his team on this project; diagnosing this life-threatening infection is very difficult, and can involve either subjecting the patient to unpleasant and potentially dangerous investigations, or can result in the use of expensive and toxic medication that may not always be needed. It is very exciting to think that a simple laboratory test may allow us to greatly simplify this process in the future."

With financial support from the University and Angel funders, a spin-out company called ISCA Diagnostics Ltd was established to enable commercialisation of the test. Global marketing and distribution of the device is delivered through ISCA's partner company OLM Medical.

The lateral flow device will be being used in hospitals around the world from August. The test uses a highly specific monoclonal antibody to detect a diagnostic marker of active *Aspergillus* infection, meaning that doctors can more precisely identify patients developing the disease.

This success is a visible example of how University bench-to-bedside Research & Development can deliver commercial impact through academic, industry and private investor partnerships.

The work has received funding from the US National Institutes of Health, HEIF, private investors, and a global pharmaceuticals company.

Professor Thornton is a fungal immunologist with a specialist interest in hybridoma technology and immunodiagnosics. His recent research has concentrated on human infections by opportunistic fungal pathogens and their rapid detection using monoclonal antibodies.

Provided by University of Exeter

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