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- [Membership](#)
- [About Us](#)

1. Cambridge Network:
2. [Home](#)
3. [News](#)
4. Cambridge Consultants develops a world first in diagnostics

# Cambridge Consultants develops a world first in diagnostics

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Product design and development firm Cambridge Consultants is working with Singapore-based start-up Endofotonics on a groundbreaking endoscopic instrument development to improve pre-cancer diagnosis. It's the world's first device to give clinicians real-time molecular diagnosis from inside the body.

Instead of taking tissue samples and waiting for lab tests, physicians get an instant diagnosis and can make timely medical decisions during routine endoscopic examinations – speeding up the treatment of diseases like stomach and bowel cancer, where early detection and treatment holds the key to long-term survival.

The endoscope-based technology developed by Endofotonics is the world's first real-time in-vivo molecular diagnostic (IMDX) system. A laboratory prototype has proved successful in initial trials involving more than 800 patients. Using its extensive track record of medical technology and surgical device development, Cambridge Consultants is now working with the start-up to rapidly build a manufacturable commercial product, complete with the necessary regulatory documentation.

The novel endoscope device consists of a spectrophotometer system, a proprietary fibre-optic probe and a customised software algorithm. It is based on Raman spectroscopy – a vibrational technique that enables molecular information to be captured when tissue molecules are agitated by a laser beam. The fibre-optic probe delivers a laser beam and captures the molecular 'fingerprint' of any tissue it comes into contact with – and the information is analysed in real time. Cancerous tissue has a different molecular 'fingerprint' from healthy tissue – so a diagnosis is provided almost instantly.

Until now, surgeons have had to take a sample of abnormal tissue and then wait for it to be analysed in the lab – a process that is dependent on the expertise of the laboratory technician and compounded by the challenge of spotting subtle pre-cancerous changes. The new technology not only gives instant results during the endoscopic examination but also makes it possible to test a much wider area of the gastrointestinal tract.

Endofotonics has successfully built two laboratory prototypes and used them on more than 800 patients across a wide variety of cancer types. "We are extremely excited at the prospect of bringing molecular diagnosis into the body," said Florence Leong, co-founder and CEO of Endofotonics.

"The ability to shift disease diagnosis from subjective operator-dependent visual recognition to objective real-time molecular diagnosis will cause a paradigm shift in how diagnosis is made – with the potential to significantly reduce cancer deaths and the burden of the disease. We are therefore looking to Cambridge Consultants to fast track the resolution of the engineering challenges of the IMDX system so that the regulatory testing and submission process can be completed by 2017."

Dr Miles Upton, Asia general manager at Cambridge Consultants, said: "Cambridge Consultants has a long history of helping innovative start-ups turn groundbreaking concepts into manufactured products fast. Combined with our experience of medical technology development in regulated markets, it means we have all the skills in-house to ensure Endofotonics secures vital competitive edge – whether that's in Asia and Europe initially or eventually also in the US market."

The technology exclusively licensed by Endofotonics was developed at the National University of Singapore (NUS). Irene Cheong, director of the NUS Industry Liaison Office – part of NUS Enterprise, the enterprise arm of the university – said: "NUS Enterprise is delighted that a technology that began its life in an NUS research lab is moving closer to market. The success achieved by Endofotonics is the latest example of how NUS Enterprise supports the commercialisation of such research."

Endofotonics is also supported via the Technology Enterprise Commercialisation Scheme (TECS) from SPRING Singapore – the pro-enterprise development government agency. “We remain steadfast towards supporting innovative start-ups developing novel technologies,” said Johnny Teo, deputy director of innovative start-ups management at SPRING Singapore. “Endofotonics’ world-first technology is a good representation of what’s possible in Singapore, and its partnership with Cambridge Consultants will be a good boost to its commercialisation efforts to bring a potentially revolutionary system to market.”

Cambridge Consultants and Endofotonics will be exhibiting at [Medica 2014](#), **November 12-15**, at the Düsseldorf Trade Fair Centre in Germany. Cambridge Consultants will be in Hall 1-E08. Endofotonics will be in the Singapore Pavilion at Hall 16-G54/F54.



For over 50 years, Cambridge Consultants has led the way in innovative product development. We are the development partner of choice to many of the world’s leading blue chips, as well as the virtual development team for ambitious start-up companies.

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