UK and Singapore collaboration delivers 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.

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