

New advances in imaging to enhance the detection of GI cancers

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A new imaging technique is under development with the aim of detecting and characterising early cancerous changes in the gastrointestinal (GI) tract.

The technique, which is today being presented at UEG Week Vienna 2016, involves using a standard endoscopy system with a novel set of camera filters, increasing the number of colours that can be visualised during endoscopy and potentially improving the ability to detect abnormal cells in the lining of the gut.

Dr Sarah Bohndiek, from the University of Cambridge, UK, who is leading on the development, explains the new technique. "In traditional endoscopy, we use white light and detectors that replicate our eyes, which detect light in red, green and blue colour channels. We are now developing an approach called 'hyperspectral imaging', which will increase the number of colour channels that can be visualised from three to over 50."

"Since cell changes associated with the development of cancer lead to colour changes in the tissues, we believe that hyperspectral imaging could help us to improve the specificity of lesion identification because we can use these colours to identify abnormal tissues", added Dr Bohndiek.

Hyperspectral imaging (HSI) collects and processes information from across the electromagnetic spectrum. In contrast to the human eye,

which sees colour primarily in three bands (red, green and blue), spectral imaging divides the colour spectrum into many more bands and can be extended beyond the visible range of light. The images obtained by HSI can provide information about the physiology and chemical composition of human tissues, and the technique is emerging as having great potential for non-invasive diagnosis and image-guided surgery.

"Hyperspectral imaging is a powerful tool that can reveal the [chemical composition](#) of human tissues and together with different fluorescent dyes, can identify a range of biological processes," said Dr Bohndiek. "The technique has many potential applications within cancer diagnostics, with exciting developments already reported in the detection of Barrett's oesophagus, which is a precancerous condition in some people."

Dr Bohndiek and colleagues from Cambridge University have been working to overcome some of the limitations of currently-available instruments used for HSI, which are complex, bulky and expensive, and are not suitable for widespread clinical use. The team have developed a small, low-cost and robust fluorescence HSI system that has already been used to image a range of dyes in realistic tissue backgrounds.

"We believe our new fluorescence HSI system, which could be readily incorporated into standard clinical endoscopies, brings the diagnostic power of [hyperspectral imaging](#) one step closer to being used for the rapid detection of early cancerous changes within the GI tract."

Provided by United European Gastroenterology

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