



New endoscope to target colon tumours

Minimally invasive endoscope using breakthrough photonics technology to enable rapid, accurate diagnosis of bowel polyps and early colon cancer.

Funded under Horizon 2020, the EU's research and innovation programme, a European group of scientists are working on the development of an innovative, compact and easy to use endoscopic device, which will play a crucial role in identifying and diagnosing pre-cancerous polyps and early colon cancers. Worldwide, colon cancer remains the third most common cancer in men, behind lung and prostate cancer, and second in women, behind breast cancer.

Colorectal cancer ranks as one of the world's most predominant cancers, affecting approximately one in ten people during their life and causing almost 700,000 annual deaths globally. Almost 95% of these cases are adenocarcinomas, which typically start as a growth of tissue called a polyp.

Today, the main method to achieve early detection of the disease is colonoscopy. While up to 40% of the patients under routine analysis colonoscopy present one or more polyps, almost 30% of these polyps are not detected, especially in the case of flat polyps. Of those detected, 29-42% are generally hyperplastic, and will not develop into cancer. The remainder are neoplastic polyps, which are of primary importance because they harbor malignant potential and represent a stage in the development of colorectal cancer. For this reason, it is essential to identify these polyps at an early stage.

Speaking about the PICCOLO Project Dr. Artzai Picon (Tecnalia) said "We hope that PICCOLO will provide major benefits over traditional colonoscopy. Firstly, by developing an advanced endoscope, using both Optical Coherence Tomography (OCT) & Multi-Photon Tomography (MPT), we will provide high-resolution structural and functional imaging, giving details of the changes occurring at the cellular level comparable to those obtained using traditional histological techniques. Furthermore, when multiple polyps are detected in a patient, the current gold standard procedure is to remove all of them, followed by microscopic tissue analysis. Removal of hyperplastic polyps, which carry no malignant potential, and the subsequent costly histopathological analysis might be avoided through the use of the PICCOLO endoscope probe, which could allow image-based diagnosis without the need for tissue biopsies".

The long term potential for this project is exciting. Not only will it provide a new approach in colon cancer detection, but the new image based diagnosis methods could be applied to diseases in other organs of the body. The PICCOLO team hope to have refined their first prototype by the end of 2018 and targets clinical trials to begin around 2020.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732111", and "This information reflects only the institution's view, so the Agencies and the Commission are not responsible for any use that may be made of the information it contains

More information
www.piccolo-project.eu



Notes to Editor:

About PICCOLO

Colorectal cancer represents around one tenth of all cancers worldwide. Early and accurate diagnosis and precise intervention can increase cure rate up to 90%. Improved diagnostic techniques with enough sensitivity and specificity are required to allow in situ assessment, safe characterization and resection of lesions during clinical practice interventions. The multidisciplinary PICCOLO team proposes a new compact, hybrid and multimodal photonics endoscope based on Optical Coherence Tomography (OCT) and Multi-Photon Tomography (MPT) combined with novel red-flag fluorescence technology for in vivo diagnosis and clinical decision support. By combining the outstanding structural information from OCT with the precise functional information from MPT, this innovative endoscope will provide gastroenterologists immediate and detailed in situ identification of colorectal neoplastic lesions and facilitate accurate and reliable in vivo diagnostics, with additional, grading capabilities for colon cancer as well as in-situ lesion infiltration and margin assessment. With the development of compact instrumentation, the cost of the components and thus the system will be significantly reduced. Human representative animal models will be used to generate imaging biomarkers that allow automated detection, assessment and grading of disease. The developed system will be tested in human samples ex vivo in operating room conditions. The consortium comprises the whole value chain including pre-clinical and clinical partners, technology providers, photonics SMEs and endoscopy market leader company. The project will permit these companies to enhance their competitiveness and leadership in the diagnostics sector as well as exploiting new market opportunities. The new endoscope will significantly impact clinical practice allowing in vivo optical biopsy assessment via the automatic analysis of images allowing accurate and efficient characterisation of colorectal lesions.



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PICCOLO

PICCOLO consortium



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