Title: A NEW MULTIMODAL PHOTONIC ENDOSCOPE TO IMPROVE IN VIVO COLON CANCER DIAGNOSIS AND CLINICAL DECISION SUPPORT

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Abstract

Colorectal cancer represents around 10% of all cancers worldwide, so 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 interventions.

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 is proposed. 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, as well as in-situ lesion infiltration and margin assessment. Human representative animal models will be used to generate imaging biomarkers that allow automated detection, assessment and grading of disease.