

## **Photonics for Robotic Surgical Guidance**

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Photonics-based technologies can assist endocavitary robotic surgery, by providing tissue diagnostics and surgical guidance. Raman spectroscopy provides biochemical fingerprints of the surgically exposed tissue, the spectral analysis of near-infrared light elastically backscattered by the tissue yields a semiquantitative assessment of tissue oxygenation, and Optical Coherence Tomography uses light to produce cross-sectional tissue images with microscopic detail level, thereby enabling a non-invasive morphological tissue mapping.

We report on the implementation of laparoscopy-dedicated approaches to Raman spectroscopy, Optical Coherence Tomography and infrared backscattering within the final phases of the FP7 European project ARAKNES - Array of Robots for Augmenting the Kinematics of Endoluminal Surgery, where these technologies will provide real-time analytical information and guidance during the surgical procedures performed on such innovative second-generation surgical robotic platform.