



LUCA: LASER AND ULTRASOUND CO-ANALYZER FOR THYROID NODULES

The EU project “Laser and Ultrasound Co-analyzer for Thyroid Nodules (LUCA)” aims to develop a new, non-invasive low-cost device that will provide more specific results in thyroid nodule screening and enable better diagnosis of thyroid cancer.

While thyroid cancer is a major and growing health challenge, current screening methods do not provide sufficient evidence and support to surgeons in their decision on the appropriate course of action. To date the large number of non-diagnostic and false positive results lead to many unnecessary surgeries. This calls for an increased sensitivity and specificity of the conventionally applied screening process.

The LUCA project therefore aims to develop a new point-of-care screening device that will combine two photonics systems, near-infrared diffuse correlation spectroscopy and time-resolved spectroscopy, with a multi-modal ultrasound system and a probe that enables multimodal data acquisition for the screening of thyroid nodules for thyroid cancer. This will allow for an early and fast diagnosis of malignant cancers and an improved specificity of the screening process superior to the conventional ultrasound-based workflow.

LUCA is driven by a multidisciplinary team, which includes clinical endocrinologists, radiologists, physicists, engineers and industry players from all over Europe. The project is divided into two main phases: phase 1 will be focused on the construction of device components while phase 2 will see the implementation and clinical validation of the LUCA demonstrator.

Once successful, LUCA will have an important socio-economic impact, diminishing the number of unnecessary surgeries and associated comorbidities and ultimately improving the quality of life of patients. The LUCA device also has the potential to be employed as an innovative diagnostic tool for other types of cancer in areas of the body accessible to ultrasound and near-infrared diffuse optical technologies.



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