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FAO: HEALTH, MEDICAL TECHNOLOGY, MEDICAL IMAGING EDITORS

# New photonics technique to eliminate unnecessary thyroid nodule surgery

A team of experts from around Europe has come together to develop a portable device with a hand-held probe that will dramatically reduce invasive diagnostic and therapeutic procedures in the treatment of potentially cancerous thyroid nodules, saving approximately €450 million Euros every year.

The Photonics PPP and EU-funded Laser and Ultrasound Co-analyzer for Thyroid Nodules, or LUCA, is a state-of-the-art device built to make thyroid nodule diagnosis more accurate and more objective.

With 128.9 million people in Europe, representing 30 percent of all European adults, having to deal with a thyroid nodule at some point in their lives, accurate diagnosis has never been so important.

Each year in Europe alone, around 800,000 cases of detected thyroid nodules will be non-diagnostic, or indeterminate. Of all these cases, 150,000, or nearly 19%, will be benign, which means that they could have avoided surgery altogether.

At €3000 per operation, excluding additional medical costs, 150,000 unnecessary surgeries could mean savings of over €450 million annually. “This money is wasted. We cannot, however, put a price on the wellbeing of a patient who does not have to undergo unnecessary surgery”, said ICREA Professor at ICFO- The Institute of Photonic Sciences, and the scientific coordinator of LUCA, Turgut Durduran.

According to Dr. Mireia Mora from the August Pi i Sunyer Biomedical Research Institute (IDIBAPS) in Barcelona,

“Current technology does not allow us to know whether a nodule is malignant or benign, before surgery takes place. We cannot take the risk of a misdiagnosis, so we operate.”

“LUCA will eliminate a lot of this guesswork. It will provide objective information so that we can see if a nodule is malignant or benign.”

According to, Professor Durduran, “The LUCA platform combines ultrasound and near-infrared diffuse optical technologies in a single device and a probe. By combining information about tissue hemodynamics, chemical constitution as well as anatomy, the technique used by this device will overcome the shortcomings of present techniques while screening for malignant thyroid nodules.”

Women tend to be more affected by this condition. Out of 30% of Europeans who have thyroid nodules, women are three times more likely to develop nodules than men. However, of those diagnosed with a malignant nodule, the ratio then drops to 2:1, men to women, respectively, albeit the fact that thyroid cancer is still more prevalent in women than in men.

Small in size, similar to a fizzy drink bottle, the LUCA probe is placed on the neck of the patient, sending light and ultrasound of different wavelengths and frequencies into the skin. “Ultrasound sees the structure and light sees the physiology, meaning we can see in much more detail than ever before”, Dr Mora said.

The implications of the LUCA device are extremely promising since it will not only signify a change in thyroid cancer screening techniques, but it may also have a potential use in the diagnosis of other cancers, such as the breast or any part of the body that is accessible.

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Notes to editors:

## **Interviews available**

### **Contact**

Sam Young

+44 79 8511 5453

sam@matterpr.com

## **About LUCA**

The LUCA project started on February 1st, 2016 and, over a 4-year period, will involve renowned organisations and industry partners from all over Europe: ICFO – The Institute for Photonic Sciences, ES (Scientific Coordinator); Politecnico di Milano, IT; Consorci Institut d’Investigacions Biomediques August PI I Sunyer, ES; Hemophotonics SL, ES; Vermon SA, FR; ECM – Echo Control Medical, FR; University of Birmingham, UK; European Institute for Biomedical Imaging Research, AT.

The LUCA project receives funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 688303 and is an initiative of the Photonics Public Private Partnership ([www.photonics21.org](http://www.photonics21.org)).

## **About Photonics21**

Photonics21 is the European Technology Platform (ETP) for photonics –a technology encompassing all of the products and processes around the emission, manipulation and detection of light. It is integral to a wide range of industries that include the medical, healthcare, transport, manufacturing, and telecommunications sectors. In December 2005 "Photonics21" was set up to bring the community of photonics professionals and industries together.

In September 2009, the European Commission defined photonics as one of five European Key Enabling Technologies (KET's) and shortly after the European Research & Innovation Program "Horizon 2020" invited Photonics21 to become a "Public Private Partnership" (PPP). In November 2013 the "Photonics 21 Association", a legal entity under Belgium law, became the private contract partner in a Public Private Partnership (PPP) in conjunction with the EU Commission.

Today Photonics21 represents more than 2500 personal members from all over Europe. Our members are experts in the photonics industry, research organisations and universities who actively engage with us to develop a joint photonics strategy for future research and innovation in Europe.

With the global photonics market growing at twice the world economic growth rate, from 350 Billion Euros in 2011 to 615 Euros in 2020, Photonics21 stands in a secure global market position. The production of European photonics alone accounts for 60 billion Euros and employs over 350,000 people directly.

With strong growth forecast, current industry trends like digitalisation, resource efficiency, individual and zero failure production will drive the photonics industry further.

For more information about Photonics21 please go to <http://www.photonics21.org/index.php>