A new laser source for infrared chemical imaging: a promising tool for early cancer diagnostic

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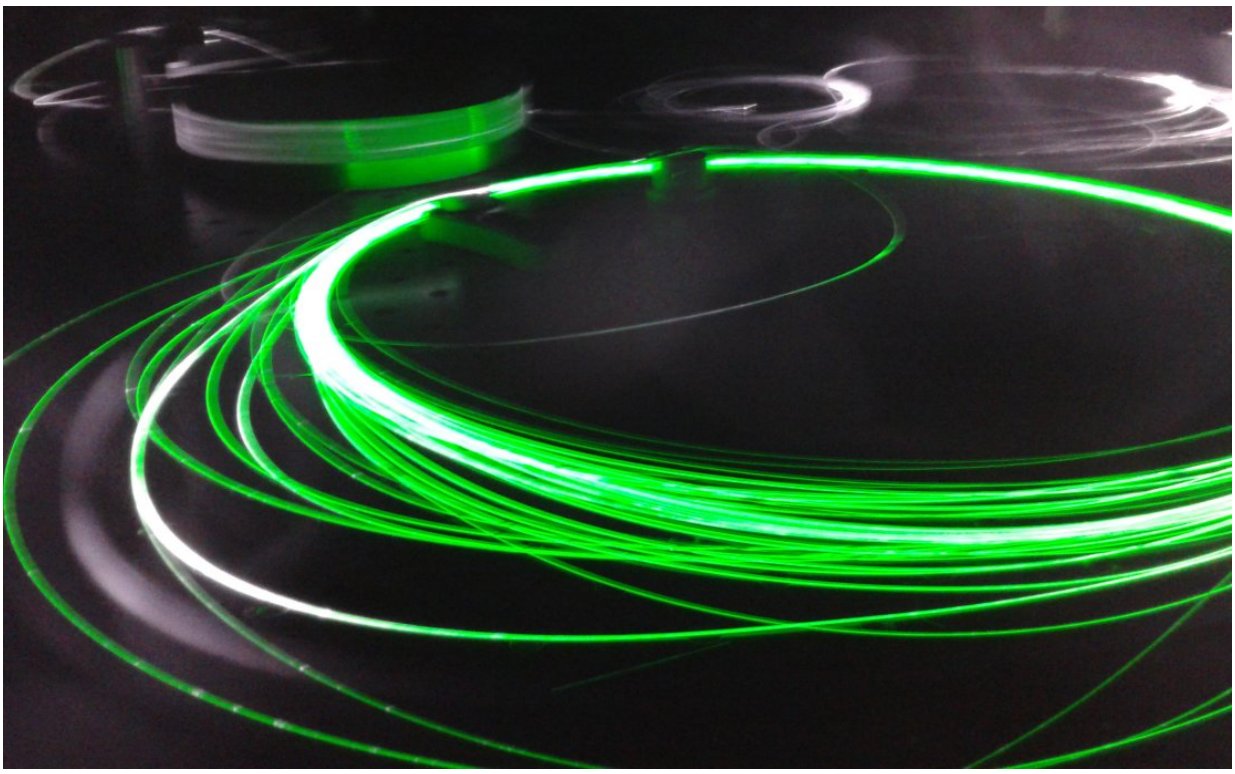

Credit: Université de Limoges

Sébastien Février, researcher at XLIM (CNRS/Université de Limoges), and his team demonstrated that a bench-top, optical fibre-based laser source can be used to perform infrared spectromicroscopy with a

precision rivaling, and in some regards even surpassing, that of experiments at large-scale synchrotron facilities.

Synchrotrons are accelerator facilities that provide powerful infrared light used for analyzing the chemical content of biological tissues with micrometer scale resolution. This high precision chemical imaging technique enables an early diagnosis of pathologies such as cirrhosis and cancer. However, up to now, the very high cost of ownership and limited availability of synchrotron sources has hindered the deployment of chemical imaging technique in the hospital.

Replacing the synchrotron with a compact laser source could unleash the potential of this technique and ease its implementation in the hospital, thus accelerating access to diagnosis and treatment.

The results were published in *Optica*, an international peer-reviewed journal dedicated to cutting-edge research in photonics.

The demonstration involved a consortium including researchers from XLIM and the synchrotron Soleil in Saclay as well as engineers from the company Novae, a start-up founded in 2013 by researchers from the University of Limoges. Novae targets industrial and scientific markets such as laser-based bio-imaging and materials micro-processing. The infrared laser is now part of Novae's portfolio of products.

More information: Manli Wang et al. Synchrotron radiation-based Fourier-transform infrared spectromicroscopy for characterization of the protein/peptide distribution in single microspheres, *Acta Pharmaceutica Sinica B* (2015). DOI: 10.1016/j.apsb.2015.03.008

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