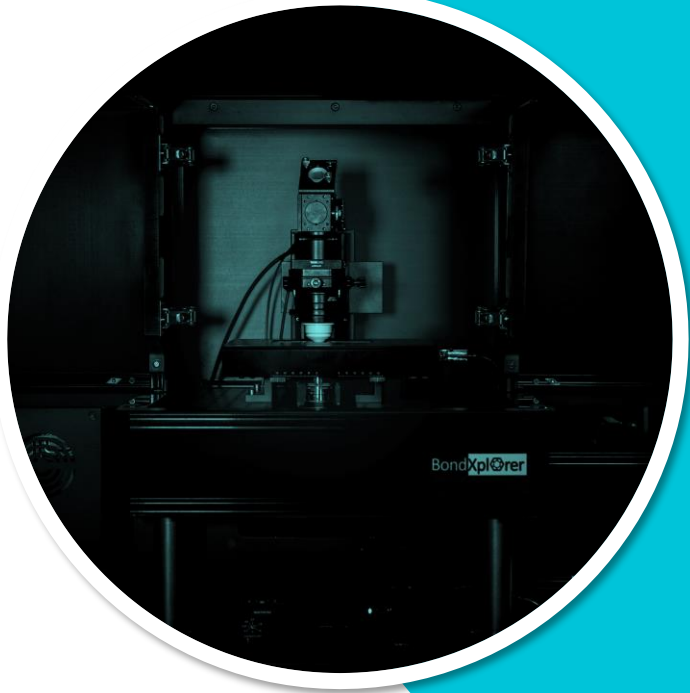


LIGHTCORE
technologies

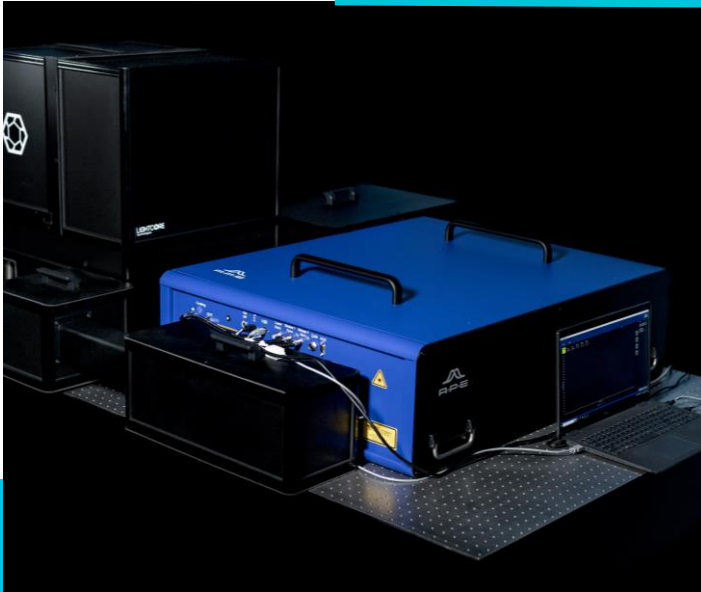


BondXplorer

Cutting edge nonlinear microscopy



Dual-color SRS microscopy



Source information

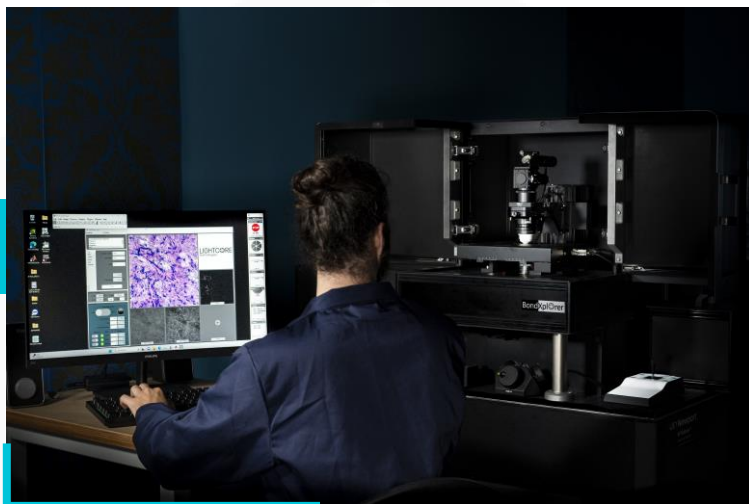
APE Delta Emerald
Dual-color : separated by 85 cm^{-1}
Broad range : $350 - 3800 \text{ cm}^{-1}$
Repetition rate : 80 MHz
Pulse width : 1 ps
Spectral bandwidth : 15 cm^{-1}
+ femtosecond output : 1030 nm
Shot noise limited

Label-free imaging

Stimulated Raman Histology (SRH) :
 CH_2 (2845 cm^{-1}) & CH_3 (2930 cm^{-1}) detection
simultaneously and non-destructively
Channels : SRS, CARS, 2PEF, SHG
FoV : up to $625 \times 625 \mu\text{m}$ (within live imaging)
($\approx \text{mm}^2$ using mosaics)



Virtual histology



Custom coloring algorithm

We developed a custom algorithm that generates a **colored** histology-like image based on the **simultaneous** CH_2 and CH_3 acquisition.

No pre-treatment

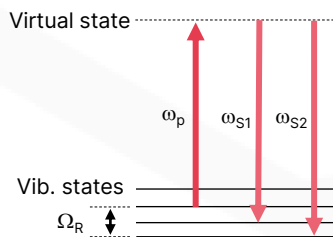
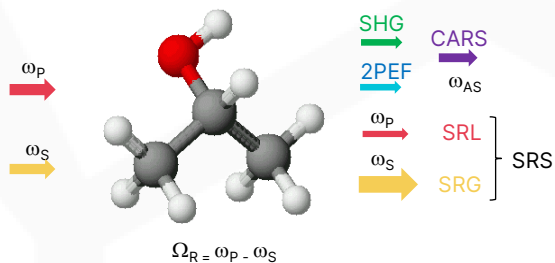
Fresh tissue can be imaged with a result comparable to conventional histology, without the need for staining or any preparation.

Versatility

C-H bonds are the most common bonds in organic tissue, which allows us to apply the coloring technique to create histology images on most biological tissues.

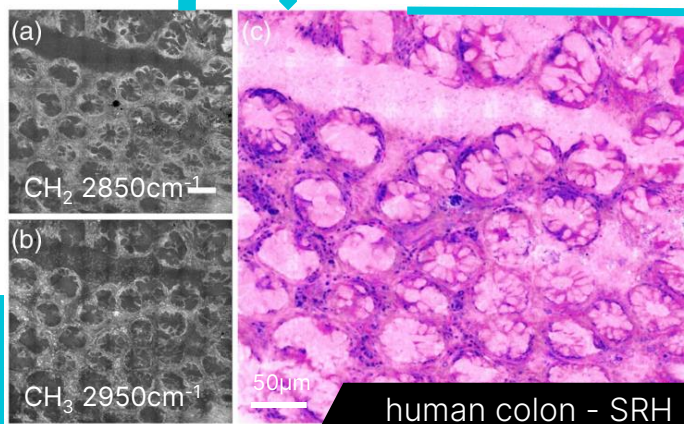


Dual-color SRS imaging



Target **2 bonds** simultaneously
 Suppress signal **background**
Live virtual histology

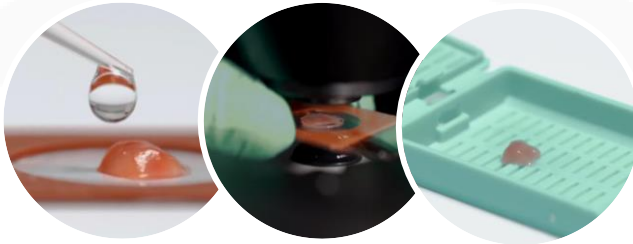
Virtual coloring



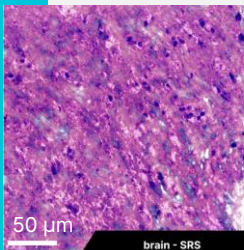


Instantaneous diagnosis

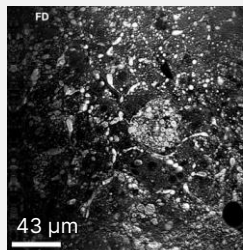
Stimulated Raman Histology (SRH) provides live images of fresh biopsies, identical to conventional histology. Well suited for cancer diagnosis and research.



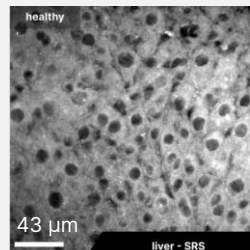
Simple and fast tissue preparation. Simply place biopsy between two glass coverslip with a drop of water.



brain - SRS



43 μm

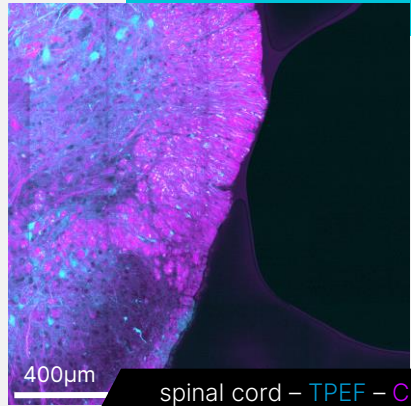
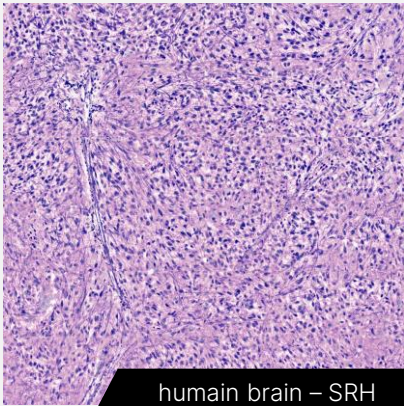


liver - SRS

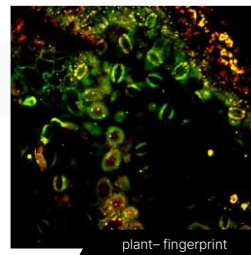
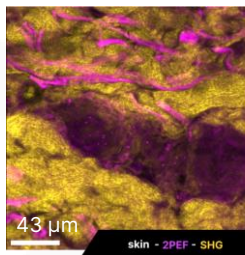
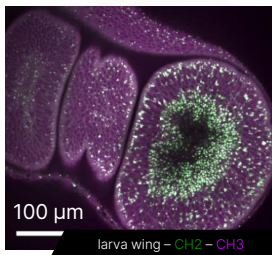


Mosaic tiling | Large field of view

Perform imaging over large field of views (several mm²) with our mosaic tiling, within a few minutes.

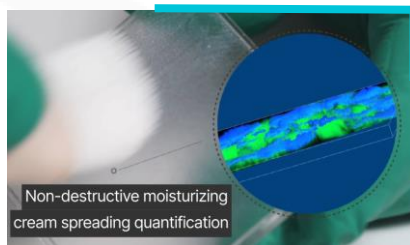
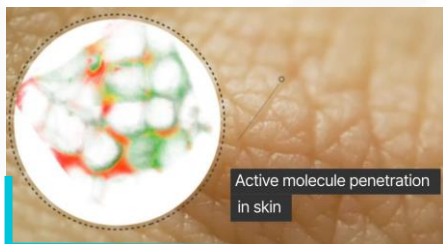


Multimodal imaging



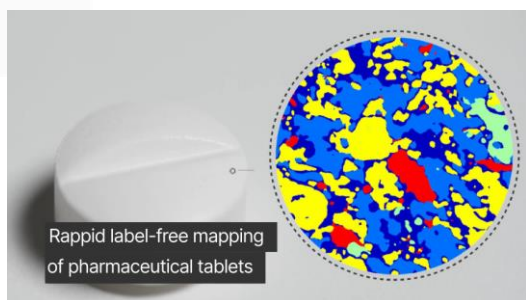


Pharmaceutical / cosmetic applications




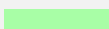




2D and 3D chemical components mapping

Using the most distinguishable Raman spectral peaks of each component to acquire immediate quantitative distribution map of active molecules without sample destruction.

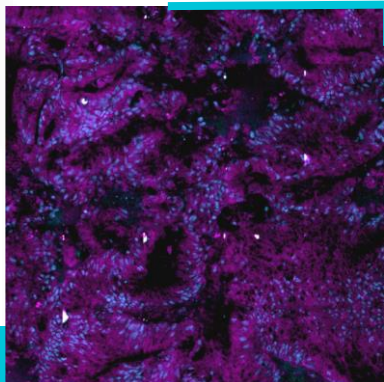


Chemical mapping :

	A-F1
	A-F2
	Background
	PEG6000
	Manitol
	Starch



Fingerprint imaging

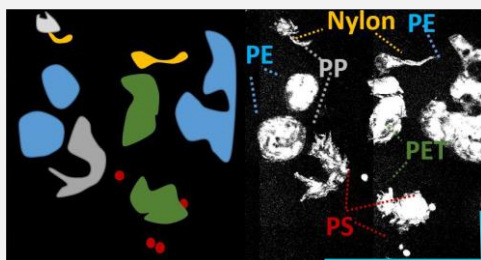


Imaging biopsy in the fingerprint

Fingerprint signals at 1350 cm^{-1} and 1450 cm^{-1} highlight the nucleus development in cancerous biopsy.

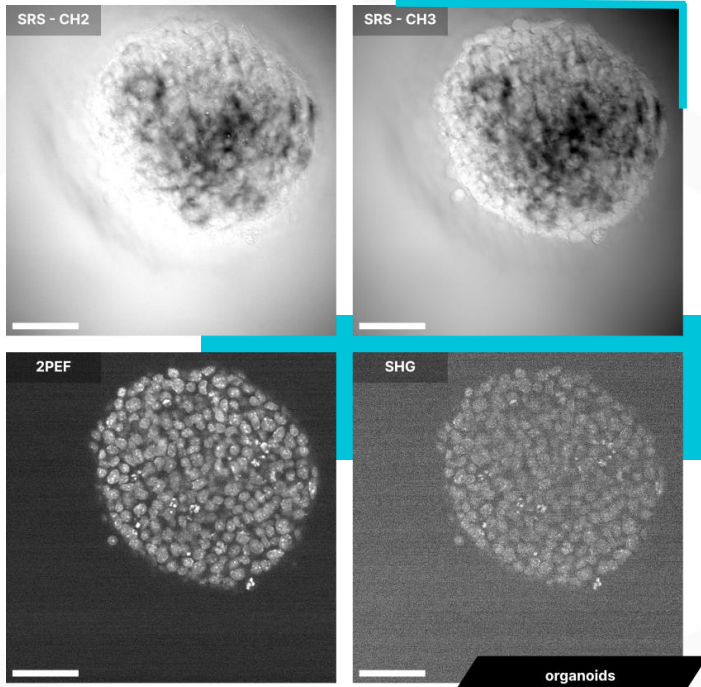
Microplastics

Identify and discriminate different plastics using the BondXplorer two wavenumbers imaging ability. In the fingerprint each type of plastics lead to a different ratio-metric ratio.





Organoids study



Organoids

Cell-based in vitro model designed to replicate some functions of an organ.

Multimodality

Simultaneous **SRS** (CH2 & CH3), **2PEF**, and **SHG** imaging.



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Academic work

B. Sarri, R Appay, S Heuke, F Poizat, F Franchi, S Boissonneau, F Caillol, H Dufour, D Figarella-Branger, M Giovannini and H Rigneault, **Observation of the compatibility of stimulated Raman histology with pathology workflow and genome sequencing**, Translational Biophotonics n/a, e 202000020 2021 <http://doi.org/10.1002/tbio.202000020>

B. Sarri, F. Poizat, S. Heuke, J. Wojak, F. Franchi, F. Caillol, M. Giovannini, and H. Rigneault, **Stimulated Raman histology: one to one comparison with standard hematoxylin and eosin staining**, Biomed. Opt. Express 10, 5378 5384 (2019) <https://doi.org/10.1364/BOE.10.005378>

B. Sarri, R. Canonge, X. Audier, E. Simon, J. Wojak, F. Caillol, C. Cadot, D. Marguet, F. Poizat, M. Giovannini, and H. Rigneault, **Fast stimulated Raman and second harmonic generation imaging for intraoperative gastro intestinal cancer detection**, Scientific Reports 9, 10052 (2019) <https://doi.org/10.1038/s41598-019-46489-x>

B. Sarri, R. Canonge, X. Audier, V. Lavastre, G. Pénarier, J. Alie, and H. Rigneault, **Discriminating polymorph distributions in pharmaceutical tablets using stimulated Raman scattering microscopy**, Journal of Raman Spectroscopy 50, 1896 1904 (2019) <http://doi.org/10.1002/jrs.5743>

Sandro Heuke, Ingo Rimke, Barbara Sarri, Paulina Gasecka, Romain Appay, Loic Legoff, Peter Volz, Edlef Büttner, and Hervé Rigneault, **Shot noise limited tunable dual vibrational frequency stimulated Raman scattering microscopy**, Biomed. Opt. Express 12, 7780 7789 (2021) <https://doi.org/10.1364/BOE.446348>

X. Chen, S. Grégoire, F. Formanek, B. Galey, H. Rigneault, **Quantitative 3D molecular cutaneous absorption in human skin using label free nonlinear microscopy**, Journal of Controlled Release 200, 78 86 (2015) <http://doi.org/10.1016/j.jconrel.2014.12.033>

B. Sarri, X. Chen, R. Canonge, S. Grégoire, F. Formanek, J-B Galey, AnnePotter, T. Bornschlögl, and H. Rigneault, **In vivo quantitative molecular absorption of glycerol in human skin using coherent anti-Stokes Raman scattering (CARS) and two-photon auto-fluorescence**, J Controlled Release 308, 190-196 (2019) <https://doi.org/10.1016/j.jconrel.2019.07.018>