

Breakthrough in microscopy, endoscopy may soon revolutionize the study of cellular origin of diseases

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A breakthrough in microscopy and endoscopy will soon revolutionize the study of the cellular origin of diseases, advancing the field of precision medicine. This is the goal of CRIMSON, a trans-disciplinary and trans-national research project recently funded by European Commission.

It will develop the next-generation bio-photonics imaging device for biomedical research, combining advanced laser techniques with artificial-intelligence data analysis.

This groundbreaking microscope will provide three-dimensional quantitative maps of sub-cellular compartments in living cells and organoids and enable fast tissue classification with unprecedented biomolecular sensitivity.

High acquisition speed will allow the observation of intra and inter-cellular dynamic changes by time-lapse imaging.

The CRIMSON project, starting 1 December 2020, lasting 42 months and with a budget exceeding 5M€, will also simulate future in-vivo studies and demonstrate the capability to image inside the body, realizing an innovative endoscope and applying it to ex-vivo thick tissue samples.

The results have potentially profound societal impacts, improving patients' quality of life and reducing public healthcare costs.

A multidisciplinary team of world-leading organizations with vertical integration of all required skills composes the consortium, coordinated by Politecnico di Milano (Italy).

Three research centers (Politecnico di Milano - Italy, Leibniz Institute of Photonic Technology e.V - Germany and Centre National de la Recherche Scientifique - France), with long-standing expertise in photonics, spectroscopy and nonlinear microscopy, will develop the technology.

Three biomedical partners (Istituto Nazionale Tumori - Italy, Institut National de la Santé et de la Recherche Médicale - France and Jena University Hospital - Germany) will validate the imaging system on open biological questions related to cancer, as paradigmatic examples of the complexity and heterogeneity of cellular diseases.

Four innovative SMEs (Active Fibre Systems GmbH - Germany, Lightcore Technologies - France, Cambridge Raman Imaging Limited - UK and 3rdPlace S.r.l. - Italy), including a biomedical equipment manufacturer, will commercially exploit the innovation, thus creating a competitive advantage in the European biophotonics-related market for microscopes and R&D tools.

Source:

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