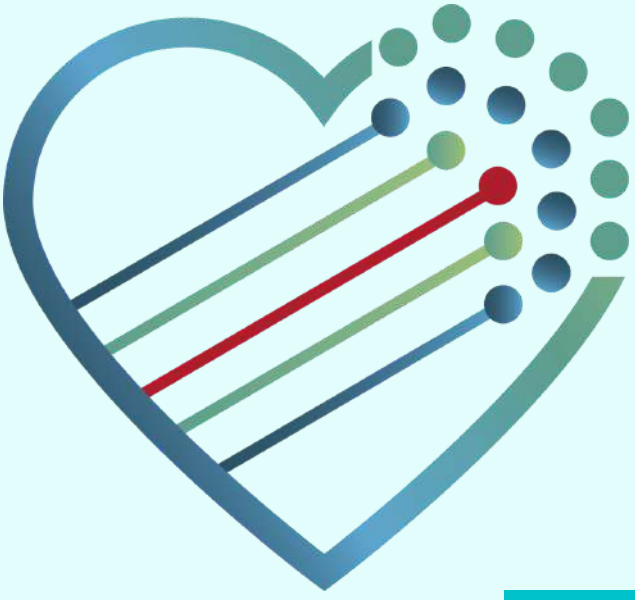
PHAST-NEWS



Biophotonics and PHAST-ETN project

By the PHAST-ETN Team

Dear reader, welcome to the PHAST-ETN project!

The aim of the **PHAST (Photonics for Healthcare: multiscAle cancer diagnosiS and Therapy)-ETN** action is to develop an innovative training programme in the field of biophotonics able to offer society a team of highly skilled multidisciplinary scientists through a personalized PhD career development plan covering the fields of cutting edge diagnostics and therapy of cancer diseases.

Photonic technologies for health, also known as biomedical photonics or “biophotonics”, offer great potentials able to revolutionize medicine, because light allows the diagnosis and healing of diseases in a gentle way and opens a pathway to minimally invasive medicine.

Today we start a series of Newsletters called "PHAST NEWS" to inform you about the exciting discoveries and the great opportunities that Biophotonics bring for the medical community.

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER THE MARIE SKLODOWSKA-CURIE GRANT AGREEMENT NO 860185

IN THIS ISSUE

OUR OBJECTIVES

The **PHAST-ETN** project provides provides excellent, highly-skilled education and training in the vibrant field of Biophotonics for 15 Early Stage Researchers (ESRs) in a strong multidisciplinary PhD programme. PHAST addresses some relevant "unmet needs" of the medical community in the prevention, diagnosis and treatment of cancer – one of the leading causes of death worldwide – to significantly improve the quality of life for European society. The main scientific goal of PHAST is to develop multiscale advanced photonic technologies for the diagnosis of cancer in vitro and in vivo and the monitoring of therapy for personalized medicine, through its **four specific objectives**:

PHAST
PHOTONICS FOR HEALTHCARE: MULTISCALE CANCER DIAGNOSIS AND THERAPY

1 IN-VITRO DIAGNOSIS AS A POINT-OF-CARE APPROACH THROUGH OPTICAL SPECTROSCOPY COMBINED WITH INNOVATIVE SAMPLING TECHNIQUES.

Development and testing of optical in-vitro diagnosis of cancer researching spectroscopic point-of-care approaches for the detection of tumour markers and multimodal imaging for ex-vivo tissue characterization.

UNIVERSITÀ DI PARMA
FRIEDRICH-SCHILLER-UNIVERSITÄT JENA
HORIBA Scientific

2 TISSUE DIAGNOSTICS AND FUNCTIONAL MONITORING BY OPTICAL FIBER-BASED BIOPSY AND DIFFUSE OPTICAL SPECTROSCOPY.

Development and testing of tissue diagnostics and functional monitoring through optical fibre based biopsy and diffuse optical spectroscopy

POLITECNICO DI TORINO
ICFO
POLITECNICO MILANO 1863

The multi-scale level approach employed by PHAST will allow early cancer detection from molecular disease markers in body liquids up to live organs. In specific cases, these techniques will be validated in the clinic thanks to close collaboration with medical institutions. The ESRs will be trained in all the technologies through hands-on laboratory platforms, thematic workshops and courses to build solid careers as biophotonics professionals in both academic and non-academic sectors. This will be possible thanks to the multidisciplinary environment created by the PHAST consortium, composed of research institutions, 2 hospitals and 8 industries.

OUR OBJECTIVES

MICROSCALE CANCER MONITORING BY MULTIMODAL OPTICAL IMAGING OF TUMOUR BORDERS DURING SURGERY.

Optimization and acceleration of surgical cancer therapy at a microscopic scale through multimodal imaging (combined OCT and Raman) for intraoperative tumor identification and tumor border detection for selective removal

MACROSCALE THERAPY MONITORING BY DIFFUSE OPTICAL SPECTROSCOPY, MULTIFUNCTIONAL OPTICAL FIBRE SENSORS, AUTOFLUORESCENCE, AND HYPERSPECTRAL IMAGING

Optimization and acceleration of cancer therapy at macroscopic scale with multifunctional optical fiber endoscopes and prediction of chemotherapy effectiveness for photodynamic therapy; diffuse optical reflectance, autofluorescence spectroscopy, and development of related clinical protocols; hyperspectral imaging techniques .

PHAST
ESR FELLOWS

Muhammad Daniyal Ghauri
@UCC

Stefan Susnjar
@SPECTRA

Matteo Calvarese
@IPHT

Dario Angelone
@UCC

Edoardo Farnesi
@FSU

Pooja Girish
@HORIBA

Aybuke Calikoglu
@ALU-FR

Faruk Beslija
@ICFO

Arno Krause
@MUW

Aizhan Issatayeva
@UNIPR

Nikhitha Mule
@OSR

Malhar Nagar
@POLITO

Sai Vamshi Krishna Damagatla
@POLIMI

Jawad Talekkara Pandayl
@LINKS

More info about our fellows are available at www.phast-eu.unipr.it

Partner organisations in PHAST

The PHAST-ETN project relies on the precious support of 8 partner organizations, which include 5 companies and 3 research institutes.

The support the project by hosting the ESR fellows during their research activity. Philips also organises a Summer School on Technology Transfer in medicine, which will take place in the Summer of 2023.

See you at the next Newsletter