



Congratulations to New ICFO PhD graduate

Dr. Claus Lindner graduated with a thesis in "Translation of Non-Invasive Optical Measurements of Hemodynamics and Oxygen Metabolism to the Clinic"

March 24, 2017

Dr. Claus Lindner received his Master degree in Physics from the Ludwig-Maximilians-University, in Munich (DE), before joining the Medical Optics research group led by ICREA Prof at ICFO Turgut Durduran. At ICFO, he centered his doctoral work on Biophotonics by studying and investigating in the field of diffuse optics and their use in patient monitoring with the focus on applications in neurology and oncology by conducting clinical human studies. Dr. Claus Lindner's thesis, entitled "Translation of Non-Invasive Optical Measurements of Hemodynamics and Oxygen Metabolism to the Clinic" has been supervised by ICREA Prof. at ICFO Turgut Durduran.

Abstract:

Several clinical studies for non-invasive estimation of tissue hemodynamics by the combination of two diffuse optical techniques, time-resolved and diffuse correlation spectroscopy, were carried out in collaboration with local hospitals. These led to the 1st application of hybrid diffuse optics in the characterization of healthy and pathological human thyroid tissue and the initiation of a European Horizon 2020 research project aiming at significantly improving the current thyroid cancer screening process.

The advantages of the hybrid diffuse optical device allowed to gain information on cerebral oxygen metabolism and improved estimation of cerebral blood flow. Data was collected from patients without brain diseases as well as healthy volunteers in clinical and surgical environments. The diffuse optical measurements were shown to correlate with the bispectral index, a widely used anesthesia monitor in the clinic.

The optically derived parameters demonstrated the conservation of physiological coupling between cerebral blood flow and oxygen metabolism in patients under protocol-induced anesthesia.

Additional studies focused on the investigation of microvascular cerebral physiology in response to common challenges in surgical procedures. These were simulated on healthy subjects and studied in depth.

Overall, this work pushes the limits of the clinical translation of hybrid diffuse optics paving the way for new applications.

Thesis Committee

Prof Davide Contini, Politecnico di Milano

Prof Dr Romain Quidant, ICFO Group Leader

Prof Marco Inzitari, Parc Sanitari Pere Virgili - Universitat Autònoma de Barcelona



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