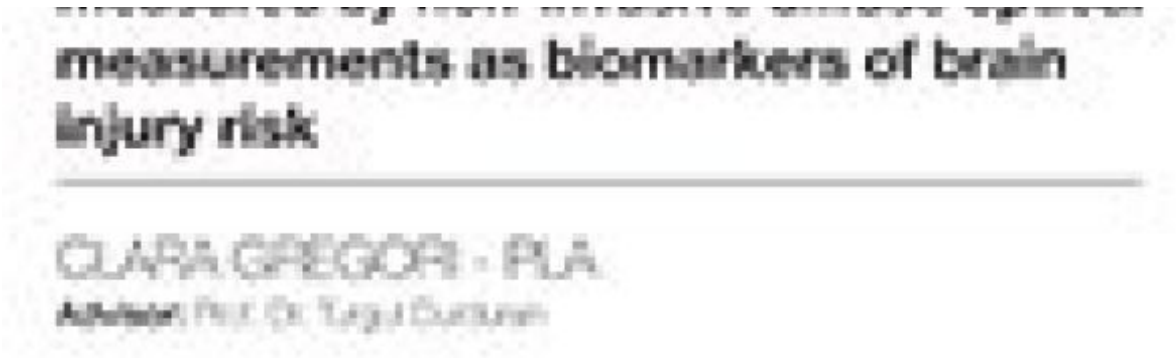

PhD Thesis Defense CLARA GREGORI 'Correlates of Cerebral Vasoreactivity Measured by Non-Invasive Diffuse Optical Measurements as Biomarkers of Brain Injury Risk'

CLARA GREGORI

March 06, 2019

Wednesday, March 6, 11:00. ICFO?s Auditorium

CLARA GREGORI

Medical Optics

ICFO-The Institute of Photonic Sciences

I have used and developed a practical new platform in the clinics for the noninvasive estimation of cerebral hemodynamics. The platform combines two diffuse optical

techniques: near-infrared spectroscopy and diffuse correlation spectroscopy.

To study patients at a high risk of cerebrovascular accidents, and those who have recently suffered an ischemic stroke, several protocols were devised and carried out. This set of multi-disciplinary studies was performed in close collaboration with the Stroke Unit and the Sleep Unit at Hospital de la Santa Creu i Sant Pau (Barcelona, Spain) with the ultimate goal to identify new biomarkers for the assessment of cerebral autoregulation and cerebral vasoreactivity, and, ultimately, cerebral well-being.

The bulk of the studies on these patients focused on the investigation of microvascular cerebral physiology in response to a non-invasive and benign challenge, without the need of patient collaboration nor any additional equipment. This challenge involved an alteration of the patient head-of-bed positioning. Interestingly, the head-of-bed challenge with the measurement of microvascular cerebral blood ow has been shown as a potential protocol to tell us about the status of cerebral autoregulation in these patients. This in turn was shown to track impairments over time, and the patients? response to treatments, and to predict long-term outcome.

Overall, this thesis pushes the limits of the clinical translation of hybrid diffuse optics, paving the way for new clinical applications at the point-of-care and in the neurocritical care.

Wednesday, March 6, 11:00. ICFO?s Auditorium

Thesis Advisor: Prof Dr Turgut Durduran