

PhD Position: Program INPhINIT Fundació La Caixa

“Multidisciplinary research on cerebral blood flow-guided early rehabilitation intervention after stroke combining the development and utilization of a new near-infrared optical neuromonitor and translational clinical research”

(Dr. Raquel Delgado-Mederos)

CENTRE: IIB SANT PAU - Fundació Institut de Recerca de l’Hospital de la Santa Creu i Sant Pau

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CENTRE DESCRIPTION

The Research Institute of the Hospital de la Santa Creu i Sant Pau (HSCSP-IR) was created on 4 June 1992 as a private scientific foundation. Its mission is to promote basic, clinical, epidemiological and healthcare research in the health science and biomedical fields, with the ultimate aim of improving the health of the population. On 10 December 2003, the Autonomous Government of Catalonia approved affiliation of the HSCSP-IR as a University Research Institute attached to the Autonomous University of Barcelona (UAB).

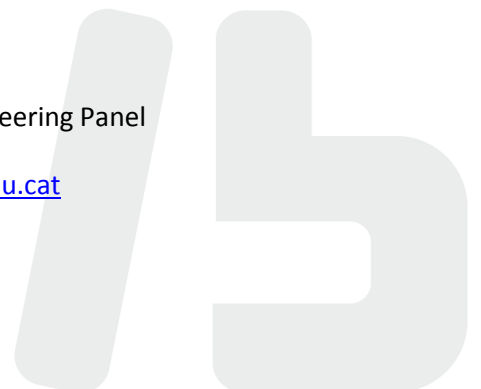
The HSCSP-IR has as its mission to improve the health and quality of life of the population through the production and dissemination of scientific knowledge, the training of researchers to an international standard, innovation in health and the incorporation of medical advances in clinical practice and in healthcare policies.

The HSCSP-IR is currently one of the most active research centres in Catalonia, especially in relation to translational research and the application of new discoveries to clinical practice. Since 2011 it has been part of the Catalan System of Research Centres (CERCA).

On 17 May 2009, the HSCSP-IR and nine other organizations created the Sant Pau Biomedical Research Institute (IIB Sant Pau), with the aim of strengthening collaborative translational research and bridging the gap between basic research and clinical practice so as to ultimately improve patient care.

AREA OF KNOWLEDGE: Physical Sciences, Mathematics and Engineering Panel

GROUP LEADER: Dr. Raquel Delgado-Mederos / rdelgado@santpau.cat



RESEARCH PROJECT/RESEARCH GROUP

Description of research projects and members of the study group

<http://www.recercasantpau.cat/es/destacats-home/grupo-de-investigacion-de-las-enfermedades-cerebrovasculares/>

POSITION DESCRIPTION

-Research Project / Research Group Description:

Background: Most acute stroke interventions aim to restore cerebral blood flow (CBF) in the affected region and prevent hypoperfusion. However, it is not possible to measure CBF on the bedside and non-invasively. Near-infrared, diffuse optical technologies offer a new opportunity to this end. However, whether CBF monitoring can identify patients who are most likely to benefit from therapies is unclear. Recently, it was suggested that the benefit of early mobilization (EM) after stroke on motor recovery may be outweighed by a deleterious effect on cerebral perfusion if cerebral autoregulation (CA) is impaired. We hypothesize that EM could improve recovery outcomes after stroke in selected patients based on CA function.

Objectives: 1) To assemble a compact, user-friendly diffuse optical monitoring system and evaluate its clinical use adapted to deliver biomarkers of CA in real time and at the bedside, 2) to investigate if EM leads to superior motor and functional outcome after stroke compared to standard care (SC) in selected patients based on optical biomarkers of CA.

Research Groups: This project is a collaboration between two groups that has been collaborating since 2009 on translating optical technologies to clinical stroke research

1. The Stroke Unit group, mainly neurologists including the PI (Raquel Delgado-Mederos) is part of the Department of Neurology at the Hospital de la Santa Creu i Sant Pau in Barcelona as a comprehensive stroke center. It participates in clinical research actively.

2. The Medical Optics group consists of twenty members led by ICREA professor Turgut Durduran. The group is focusing on consolidating its activities on introducing novel, new diffuse optical technologies to clinical applications working with local and international hospitals, industry and academia. Furthermore, in 2013, we have launched a spin-off company, Hemophotonics SL, which commercializes a neuro-monitor based on diffuse correlation spectroscopy (DCS).

-Job position description:

The investigator associated to this project will carry out his doctoral thesis on a specific aspect of the project: to bring to clinical practice a new developed compact, user-friendly, medical-grade “fast diffuse correlation spectroscopy” system that can be battery powered, “ready-to-use” and can be operated by the medical personnel to measure local, microvascular CBF to assess both static (slower than 1 Hz) and dynamic (several Hz) changes in CBF due to changes in body position as impressed onto CBF, autoregulation and intracranial pressure. He/she will also work in the analysis of the CBF, dynamic autoregulation and large changes in intra-cranial pressure from the DCS data to evaluate the individual status of cerebrovascular function after stroke.

The investigator will be integrated as a member of the coordinated research team, which include the Stroke Unit of Hospital Santa Creu i Sant Pau and the Medical Optics Group of Institute of Photonic Sciences (ICFO)

OTHER RELEVANT WEBSITES

ICFO Medical Optics group, PI: ICREA Professor Turgut Durduran

https://www.icfo.eu/lang/research/groups/groups-details?group_id=29diseases<https://www.cibercv.es/grupos/grupo-de-investigacion/ficha-personal?id=22819>

