Fixed-term contract in Technology Transfer: Non-invasive electrochemotherapy

Context

Recently, the medical sector has experienced a certain effervescence linked to the rapid development of electrotechnologies, which are increasingly associated with life. These treatment techniques, such as electroporation by application of pulsed electric fields, opens the way to new modes of treatment for medical orientations such as the treatment of tumors by electrochemotherapy (ECT) or the electrotransfer of genes.

ECT was conceived and developed by L.M. Mir, director of VTA CNRS at Gustave Roussy. It is based on the local application of intense and short-duration electrical pulses that permeabilize the cell membrane in a transient and reversible way allowing the entry of molecules into the cells through creation of pores in the plasma membrane. ECT therefore makes it possible to deliver drugs inside the cell, such as bleomycin, whose effectiveness is normally limited because they do not naturally enter the cells. ECT now has been widely used for the treatment of skin and/or subcutaneous tumors and metastases, using invasive electrodes. Moreover ECT requires surgery for the treatment of deep tumors.

An ANR was filed and obtained in 2018: this is the ESCAPADE project. The goal of ESCAPADE is the development of a pulse source associated with an electromagnetic wave (EM) emission system, to explore a new pathway in the medical field that would treat non-invasive deep tumors in a reversible or irreversible way. The future pulsed power source will consist of a pulse generator capable to deliver very high voltage gradient signals. For the medical application, the latter will be associated with a near field antenna.

SIAME laboratory has received a financial support by E2S UPPA for the NI-ILO project.

Missions

The recruited person is asked to conduct a bibliography analysis and come up with a state of the art related to similar technologies which were developed by other research groups and institutions.

Electric analysis using LTspice and/or electromagnetic analysis using CST are required in addition.

Participation in the development, implementation and testing phase is one of the most important tasks.
Work conditions

Location: Université de Pau et des Pays de l'Adour, 64000 PAU, France

Hosting Laboratory: SIAME

Contract duration: 1 year, full time

Starting date: January 2020

Remuneration: according to qualification

Requirements

PhD Title, Master degree or an equivalent foreign Diploma in the domain of electrical engineering (e.g., high-voltage, pulsed power or electromagnetism).

Experience in the domain of pulsed power or high-voltage technology would be highly appreciated.

Experience with electric circuit solvers and/or electromagnetic software.

The candidate must be capable to perform research without day-by-day guidance (a good level of English is preferable).

Application

For more information and for applying for this position, please contact Professor Laurent Pecastaing by email at laurent.pecastaing@univ-pau.fr.

Documents required:

- detailed CV, with yours skills obtained in the concerned fields,
- cover letter

Deadline: December 10th, 2019