Direction de la Recherche Technologique

Laboratoire d'Electronique et de Technologie de l'Information

PhD
Design of biocompatible and flexible conductive materials

CEA/LETI/Healthcare department is a 150+ people department devoted to the development and industry transfer of micro- and nano- technologies in the biology and healthcare fields (Leti HEALTH, http://www-leti.cea.fr/en). Closely with hospital universities and institutions of higher education, the Healthcare Department develops new technologies to improve medical diagnosis and treatment of patients in a multidisciplinary environment linking fundamental research and industrial transfer of technologies.

CNRS/CERMAV is a fundamental research center devoted to glycosciences, with strong and multidisciplinary expertise that spans from chemistry, physical-chemistry, biology to material sciences. It covers all the areas related to oligosaccharides, polysaccharides, glycoproteins and glycomaterials: their *in vivo* and *in vitro* synthesis, their characterization, functions and applications to answer to major societal challenges in the fields of human health, emerging energies and materials for new technologies.

Position description

The development of biocompatible, flexible and stretchable electronic devices is a great challenge. The main goal of the PhD is the design and study of new conductive materials which originality lies in the combination of two crosslinked polysaccharide systems incorporating a conducting polymer. These organic conductive tracks and electrodes will be deposited on stretchable chitosan-PEG films whose mechanical properties can be well controlled. The electrical, mechanical, and structural properties of the materials will be characterized. Their biocompatibility will be assessed by standard assays, and the electrodes will be tested in rodents (biocompatibility and resorbability assays). These biocompatible stretchable electrodes are expected to improve tissue adhesion and prevent scar tissue formation. In general, such conductive stretchable materials would be of high interest to overcome different challenges (stretchability, flexibility, biocompatibility) in the design of implanted or portable biosensors.

Location: CEA and CERMAV, Grenoble, France **Duration**: 3 years **Start**: September/October 2018

Required Skills:

Applicants should hold a Master of Sciences in Polymer Science or polymer engineering with knowledge in polymer chemistry, organic chemistry, and electrochemistry (basics). This subject will make the candidate acquire knowledge and know-how in different material-related fields (mechanical, electrical properties, interface with biological tissues, biosensors…) which will allow him/her to further apply to a wide range of positions in industrial or academic R & D at the end of his/her contract. Ability to work in a cross-disciplinary environment in connection with biologists, chemists, industrial and clinicians is absolutely required. Good skills in English.

Contact:

Interested applicants should send a Cover letter, a CV and recommendation letters. Please send your application only by email to isabelle.texier-nogues@cea.fr and **rachel.auzely@cermav.cnrs.fr.**

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