

Post-Doctoral Position

Institute of Electronics and Telecommunications of Rennes (IETR), France

ANTENNAS SYSTEM AND WIRELESS POWERING OF INJECTABLE DEVICE FOR BIOMEDICAL TELEMETRY

Context

In-body wireless electronic devices are increasingly used for monitoring physiological parameters in animals and humans. Recent progress in electronics and wireless technologies allows to design very compact injectable, implantable, or ingestible devices (implants, capsules, pills, etc.) for identification or physiological data monitoring. The lifetime of injectable and implantable devices is directly related to the available power. Wireless powering of such devices is an extremely attractive solution allowing to substantially increase the lifetime of in-body devices and potentially reduce their size. Design of wirelessly powered devices involves several research challenges, in terms of wireless transmitter and its integration, but also in terms of trough-body propagation and potentially exposure reduction of users.

Objectives

The post-doctoral research project is focused on development and design of an antenna solution for wireless charging and data transmission for a compact injectable wireless implant.

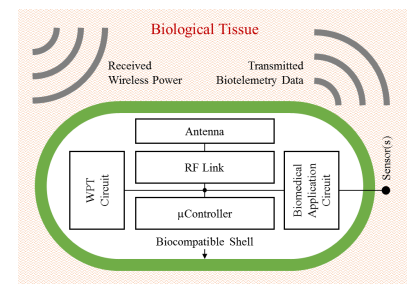
Framework

The Post-Doctoral Researcher will work at the Institute of Electronics and Telecommunications of Rennes (IETR, www.ietr.fr). This is a collaborative project with BodyCap (www.bodycap-medical.com), one of the leaders in miniature wireless in-body sensors and associated technologies. Both partners will combine their expertise in antennas, wireless telemetry, in-body communications, propagation, and dosimetry to implement wireless charging into a miniature in-body sensor.

Work description

The proposed research project will mainly consist of the following tasks:

- Analyzing the link budget and defining specifications of wireless power and data transmitting RF antenna system for a miniature in-body injectable device.
- Designing the antenna system allowing wireless charging of the implant and biotelemetry data transmission.
- Developing equivalent biological tissue models (phantoms) for assessment of through-tissue propagation.
- Participating in the prototype manufacturing and characterizing the antenna system experimentally.



Candidate

Required education level: PhD or equivalent degree.

Duration: 12 months

Required background: miniature antennas and matching circuits, wireless powering, RF measurements, dosimetry, numerical modeling. Knowledge of French is not required, but will be highly appreciated.

Contacts

To apply please send your motivation letter, CV, and recommendation letters (optional) to:

Dr. Maxim ZHADOBOV

Denys NIKOLAYEV

Prof. Ronan SAULEAU

Institute of Electronics and Telecommunications of Rennes (IETR), University of Rennes 1, France

Email : maxim.zhadobov@univ-rennes1.fr

denys.nikolayev@univ-rennes1.fr

ronan.sauleau@univ-rennes1.fr