



## **Post-Doctoral Position in Bioelectromagnetics**

(IETR, Rennes, France)

### **SELECTIVE TARGETING OF HUMAN CELLS BY PULSE-MODULATED MILLIMETER WAVES: INSTRUMENTATION AND EM / THERMAL DOSIMETRY**

#### **Context:**

Electromagnetic (EM) radiations have been successfully used in a number of medical applications including microwave hyperthermia, electrochemotherapy, MRI, etc. Some recent results have demonstrated that, under certain experimental conditions, modulated microwave and millimeter-wave exposures may interfere with the cell functioning. This could allow targeting selectively certain types of cells (as for instance cancer cells) and lead in the future to some highly promising biomedical applications.

#### **Objectives:**

This post-doctoral research project will be focused on the design, development, and EM / thermal characterization of a millimeter-wave system with amplitude and frequency modulation for exposure of biological cells *in vitro*.

#### **Job description:**

The Post-Doctoral Researcher will work at the Institute of Electronics and Telecommunications of Rennes (IETR, [www.ietr.fr](http://www.ietr.fr)), often cited as one of the world leaders in electronics and wireless communications, in the Bioelectromagnetics research team of the Antennas & Microwaves Department. This is a collaborative project with the Intercellular Protein Homeostasis Team of the same University. Two research teams will combine their complementary expertises in electromagnetics, numerical modeling, and cellular biology.

The research project of the post-doctoral researcher will mainly consist in the following tasks:

- Development and implementation of a near-field millimeter-wave exposure system with amplitude and frequency modulation capabilities.
- Performing of associated measurements at microwaves (VNA, spectrum analyzer, high-resolution oscilloscopes, etc.). Carrying out of series of experimental tests using exposure and dosimetry systems.
- Use of advanced numerical tools for EM / thermal modeling.

#### **Candidate:**

*Required education level:* PhD or equivalent.

*Required background:* electromagnetics, microwave measurements and dosimetry, numerical modeling, bioelectromagnetics. Basic knowledge in cell biology and microscopy are welcome.

#### **Duration and funding:**

Annually renewable position beginning as soon as possible is funded by the French National Research Agency (ANR) project "Bio-electromagnetic compatibility of emerging body-centric wireless networks".

#### **Contacts:**

To apply please provide a motivation cover letter, CV, recommendation letters and / or references, and copy of PhD diploma.

**Dr. Maxim ZHADOBOV Prof. Ronan SAULEAU**

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

Email : [Maxim.Zhadobov@univ-rennes1.fr](mailto:Maxim.Zhadobov@univ-rennes1.fr) [Ronan.Sauleau@univ-rennes1.fr](mailto:Ronan.Sauleau@univ-rennes1.fr)