

# 1 year postdoc offer in computational cardiac electrophysiology (extendable up to 1 year)

## Job Profile

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### Offer description

The *institut du thorax* is a public expert center dedicated to translational research (from bench to bedside) focused on the pathophysiology of cardiovascular, respiratory and metabolic diseases.

Cardiac arrhythmias are associated with sudden cardiac death, which is responsible for 15-20% of annual morbidity worldwide. Unfortunately, the state of the art in the treatment of arrhythmias remains suboptimal. The development of new and effective therapies requires improvement of the understanding of the disease: its mechanisms for onset, progression and termination, for necessitate truly cross-disciplinary approaches. Currently, cardiac arrhythmias are diagnosed in the clinic on the basis of electrocardiogram (ECG) signals. However, these do not provide sufficient and detailed information about the possible underlying causes. In order to connect the different scales of the problem (cell-tissue-organ) and identify the respective impacts on the ECG, we resort to the use of mathematical models. The grand aim of the project will be to develop an electrophysiologically-detailed, comprehensive model of the cardiac electrical conduction system (CECS), that is dedicated to the study of cardiac arrhythmias. The successful candidate will be expected to develop a finite-element model of the human heart from which ECGs signals can be extracted and compared with clinical data.

### Researcher profiles

- First-Stage Researcher (*PhD candidate*)
- Recognised Researcher (*with less than 4 years research experience after PhD*)
- Established Researcher (*with more than 4 years research experience*)
- Leading Researcher

### Research Fields (2 max.)

- |  |   |
|--|---|
| <input type="checkbox"/> Biological Sciences         | <input type="checkbox"/> Medical Sciences         |
| <input type="checkbox"/> Chemistry                   | <input type="checkbox"/> Neurosciences            |
| <input checked="" type="checkbox"/> Computer Science | <input type="checkbox"/> Pharmacological Sciences |
| <input type="checkbox"/> Engineering                 | <input checked="" type="checkbox"/> Physics       |
| <input type="checkbox"/> Environmental Science       | <input type="checkbox"/> Technology               |
| <input type="checkbox"/> Ethics in Health Sciences   | <input type="checkbox"/> Other (specify):         |

### Main Activities

- Conducting research
- develop a finite-element model of the human heart from which ECGs signals can be extracted and compared with clinical data.

### Associated Activities

- Training and mentoring undergraduate and graduate students (Master and PhD)
- Grant writing

### Specific Requirements or Constraints

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- Skills/Qualifications**
- Good understanding of the finite element method.
  - Ability to write and develop computer programs in C/C++/python/Fortran etc.
  - Open-mindedness, motivation to work in an interdisciplinary environment
  - Fluency in English (both oral and written)
  - Ability to work with experimentalists
  - Independent and analytical thinking
  - Self-motivated

**Required Experience**  0 to 2 years  2 to 4 years  4 to 10 years  >10 years

**Fields:**

**Nonlinear dynamics, biology, computer modelling, experience with biological systems preferred but not mandatory**

**Required Education Level or Diploma**

- PhD

**Required Languages**

- English (compulsory)

### Hosting Unit

**Code** UMR 1087

**Name** The research unit of *l'institut du thorax*

**Director** Richard Redon

**Composition** 200 people

**Address** 8 quai Moncousu, 44000 Nantes, France

**Website** <https://umr1087.univ-nantes.fr/>

### Contract

**Type** Fixed term contract

**Duration** 12 months (renewable)

**Salary** Upon experience and according to INSERM salary standards

**Envisaged Start Date** 01.10.2024

## Application

**Applicants must send a CV and a cover letter to:**

**Rupamanjari Majumder**

[rupamanjari.majumder@univ-nantes.fr](mailto:rupamanjari.majumder@univ-nantes.fr)

**Deadline for application:**

Position open until filled.