

## **Ph.D. student**

At the Laboratory Imagerie et Modélisation pour la Neurobiologie et la Cancérologie (IMNC), Centre National de la Recherche Scientifique (CNRS), Campus d'Orsay (France),

A Ph.D. student position will be available from October 2019 in the field of innovative radiotherapy techniques, in particular Grid and minibeam radiation therapy.

Radiotherapy (RT) is one of the most frequently used methods for cancer treatment (above 50% of patients will receive RT). Despite remarkable advancements, the dose tolerances of normal tissues continue to be the main limitation in RT. Finding novel approaches that allow increasing normal tissue resistance is of utmost importance. This would make it possible to escalate tumour dose, resulting in an improvement in cure rate. With this aim, we propose a new approach, called proton minibeam radiation therapy (PROTONMBRT), which has already been shown to drastically reduce neurotoxicity while providing an equivalent or superior tumor (glioma) control than standard RT in small animal experiments.

### **Missions**

We are seeking an enthusiast student for a fully-funded, three years' position starting in Autumn 2019 working in the "New approaches in Radiation therapy" team at the IMNC lab (CNRS UMR8165, Campus d'Orsay, 25 km south of Paris), in close collaboration with the Institut Curie - Orsay Proton therapy centre. The successful candidate will be involved in the development of an innovative and promising radiotherapy technique, called proton minibeam radiation therapy (pMBRT). In particular, the Ph.D. student will actively work in the development of an adequate dosimetry tools (protocols and treatment planning system) of pMBRT to prepare the forthcoming clinical trials. He/she will also participate in the optimisation of proton minibeam generation for patients' treatments.

### **Activities**

- Monte Carlo simulations
- Experimental dosimetry

### **Skills**

- MsC. in Physics, Medical physics or relevant engineering studies.
- Background in radiotherapy is an asset.
- Experience in Monte Carlo simulations and coding would be appreciated

### **Work Context**

The PhD student will develop his work in the frame of an ERC Consolidator grant whose main objectives are to disentangle the biological mechanisms involved in tumor control and normal tissue preservation, as well to optimise the method for minibeam generation and to develop a complete set of dosimetric tools adequate for patient treatments.

The “New Approaches in RAdiotherapy” team is a pioneer the conception and development of innovative methods based on the use of the spatial fractionation of the dose. This strategy has already shown a remarkable reduction in side effects of the radiation. Since we do not believe in frontiers, NARA was born in 2013 with an interdisciplinary character and international composition. We work at the interphase between medical physics, computing (Monte Carlo simulations), and radiobiology.

The work will be done in tight collaboration with Orsay proton therapy center. Part of the Radiation Oncology Department of the Institut Curie, the ICPO, has been treating patients since 1991, being the first protontherapy facility in France. The two existing passive beamlines were built by the ICPO physics and technical team whose strong background allows the development of new clinical and research applications for proton therapy. For many years, dedicated resources (beam time, manpower) are available for research programs. The teams have a long experience in research collaborations with the CNRS, CEA and European centers in radioprotection, treatment planning, robotics, dosimetry, beam modelling, radiation biology and clinical trials.

### **General information**

Workplace: Orsay (France)

Expected date of employment : 1st October 2019

Proportion of work : Full time

Remuneration : 2135 €/month pre-tax

### **Contacts and information**

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**Interested candidates please send your candidacy before 15/06/2019 via the following link:**

<http://bit.ly/2uUdH9w>