JOB DESCRIPTION

We are seeking a postdoctoral researcher to work on an exciting project for 1.5 years (possibly continued through requested projects) to enhance the precision in radionuclide dosimetry. The candidate will carry out clinical dosimetry based on SPECT and PET images for beta-particle emitters and investigate the possibility of Compton camera images for dosimetry beyond beta-particle emitters. This post will work closely with the medical physicists and physicians involved in radionuclide treatment at the hospital La Fe and with the researchers developing the high spatial and energy resolution Compton camera (MACACO III) at the IFIC (High Energy Physics Research Center).

Fighting cancer is a priority for the EU, as established in the Europe´s Beating Cancer Plan agreed in 2022. Medical imaging with ionizing radiation constitutes a key tool in diagnostics, staging and assessment of cancer treatments. Ionizing radiation has been used also for treatment, not only in the form of external beam or encapsulated radioactive sources (brachytherapy), but also like radionuclide joint to a molecule or attached to a microspheres. Targeted Radionuclide Therapy (TRT) employs unsealed radioactive sources, mostly radiopharmaceuticals to deliver radiation selectively to the tumors and target organs. In these treatments the estimation of the delivered radiation dose to lesions and organs at risk is part of the treatment and it is referred as dosimetry. The dosimetry can be done to individually plan the treatment (assessing a given activity) or to verify the treatment. Broadly, the dosimetry of healthy tissues assures radiation safety, whereas for the tumors it allows to optimize the treatment.

The recent impressive growth in TRT represents a significant shift towards more effective and personalized cancer and disease treatments. This approach holds great promise for improving patient outcomes and quality of life while minimizing the side effects often associated with traditional therapies. Accurate and personalized dosimetry is needed to fully understand the outcomes of these treatments.

This work will 1) directly influence the procedure of dose estimation in current TRT of cancer patients undergoing injectable radioactive therapy as part of their treatment, 2) provide tools

to improve the accuracy of the dose estimation (partial volume effect), and 3) provide key building blocks to create dosimetry calculations based on the Compton camera images.

The work spans from imaging to clinical dosimetry and can be easily carried out by somebody with Monte Carlo modelling skills, SPECT and PET imaging knowledge, and a good understanding of the basic radiation dosimetry principles. Optional experimental work spans phantom preparation for prototype testing, and radiobiology.

In this post, the successful candidate will work closely with Dr. Torres-Espallardo, her team at the hospital, and Dr. Llosa and her team at the research center, as well as collaborate with other members of the Nuclear Medicine Department, Clinical Area of Medical Imaging and of Biomedical Imaging Research Group.

The team is committed to providing an inclusive and supportive environment for all. See https://www.acim.lafe.san.gva.es/acim/?page_id=13371&page=4&lang=es and https://ific.uv.es/iris/en/people/index.html and associated pages for more on who we are and what we do.

This post will be offered on a fixed-term contract until 30 June 2025.

This is a full-time post - 100% full time equivalent.

KEY RESPONSIBILITIES

- Whole body and organ/tumour-specific dosimetry based on clinical imaging studies.
- Monte Carlo modelling of range of scenarios ranging from beta, alpha and Auger-electron emitters to determine radiopharmaceutical-specific requirements from a dosimetry/physics perspective for optimal therapeutic efficacy.
- Accurate and comprehensive record keeping and robust documentation of data acquisition.
- The job holder will regularly gather data, conduct detailed analyses, and interpret standard data/information, reporting and presenting findings as appropriate. They will assist others to acquire or interpret research data, highlighting any issues.
- Participate at conferences (national, international, and internal conferences), including presenting posters and oral presentations.

- Prepare manuscripts in collaboration with supervisors and other members of the Department.
- Design and undertake experiments independently as well as in collaboration with others.
- Supervise, train, and assist junior members and students.
- Collaborate with other members of the department, lending skills to support other's research, where appropriate.

The above list of responsibilities may not be exhaustive, and the post holder will be required to undertake such tasks and responsibilities as may reasonably be expected within the scope and grading of the post.

SKILLS, KNOWLEDGE, AND EXPERIENCE

Essential criteria

- PhD awarded or near completion in computational modelling, medical physics, or another relevant field.
- Degree in Physics or another relevant field
- Highly computer literate with coding expertise, e.g., MATLAB, Python
- The ability to take individual responsibility for planning and undertaking own work, according to clinical and scientific deadlines.
- Skills in presenting scientific research in the form of papers, posters, and oral presentations.
- Collaborative approach to scientific research and showcasing honesty and integrity.
- Self-motivated to undertake scientific research and implement own initiatives.

Desirable criteria

- Knowledge in dosimetry programmes and/or Monte Carlo modelling, e.g., MIRD, OLINDA.
- Postdoctoral experience in SPECT and PET image reconstruction or computational modelling in medical physics.
- Experience applying radiation dosimetry principles.
- Development of statistical and computational dosimetric methods if relevant.
- Radiation training and knowledge of handling and safety of radioactive materials.
- Experience in calibration procedures.

APPLICATION DEADLINE

3rd March 2024 (23:59 CET).

CONTACT

Send your CV and a recommendation letter to torres_ire@gva.es.