The mission of the Catalan Institute of Nanoscience and Nanotechnology (ICN2) is to achieve the highest level of scientific and technological excellence in Nanoscience and Nanotechnology. Its research lines focus on the newly-discovered physical and chemical properties that arise from the behavior of matter at the nanoscale. ICN2 has been awarded with the Severo Ochoa Center of Excellence distinction for two consecutive periods (2014-2018 and 2018-2022). ICN2 comprises 19 Research Groups, 7 Technical Development and Support Units and Facilities, and 2 Research Platforms, covering different areas of nanoscience and nanotechnology.

Job Title: Research Associate in Graphene Bioconjugate Chemistry

Research area or group: Nanomedicine Group

Description of Group/Project:

The main lines of research in the Group include:
- Clinical translation of bioelectronic and microfluidic devices
- Nanomaterials as vector systems for therapeutic and diagnostic applications
- Development of graphene and 2D materials in medicine
- Discovery of novel biomarkers and therapeutic targets in oncology and neurology

The group brings to the Institute a strong expertise in research and development of novel types and applications of established nanoparticle systems, particularly liposomes. Moreover, rich experience in the medical translation of carbon nanomaterials, at varying shapes and dimensions, such as fullerenes, carbon nanotubes, nanohorns and graphene. A wide range of nanomaterials developed as platforms for the biological transport of therapeutic and diagnostic components in cell culture and preclinical disease models. The primary therapeutic targets for clinical translation of these technologies have been cancer (solid and metastatic) and brain pathologies (Parkinson's, stroke, Alzheimers, glioblastoma).
Nanomedicine@ICN2 has strong links with the Nanomedicine Lab at the Faculty of Biology, Medicine and Health at the University of Manchester, with Prof. Kostas Kostarelos leading both teams in a joint effort to develop medicines at the nanoscale. Graphene and 2D materials will have a central role in a number of research lines carried out in the context of the Graphene Flagship Biomedical Technologies Work Package.

Main Tasks and responsibilities:

The Research Associate in Graphene Bioconjugate Chemistry will contribute to the scientific programme and management of the Graphene Flagship project. The work will involve surface modification of different types of graphene and related 2D materials, some of which will need to undergo chemical modification to be biochemically studied (on interaction with different biological entities and cells). The Research Associate should be able to perform such experimental work alone or in collaboration with partner laboratories to improve their biocompatibility and offer added functionality to the 2D materials. Expert use of a chemical synthesis laboratory and a wide range of physicochemical and materials characterisation techniques (Raman, AFM, SEM, TGA, DLS, spectrophotometry, electron microscopy, ICP-MS, XPS) will be essential to determine the mechanisms and impact of interaction between graphene and cellular models and tissues.

Principal responsibilities:

- Through interaction with the PI and other members of the Nanomedicine Group to contribute proactively to the development, progression and execution of the project
- Synthesis, functionalization, and characterisation of various graphene-based materials (graphene oxide, exfoliated graphene, other 2D material)
- Covalent and non-covalent graphene complexation with biologically active molecules (small molecules, proteins, peptides)
  o Use of chemical synthesis tools and protocols to surface-modify 2D materials
- Use a range of physicochemical and materials characterisation techniques (Raman, AFM, SEM, TGA, DLS, spectrophotometry, electron microscopy, HPLC, XPS)
- Execution of experiments using different core facilities at the Campus UAB and collaborating institutions
- Training and supervision of students and researchers in physicochemical and materials characterisation tools and protocols established and core facilities used
- Contribution to the scientific management of the collaborative project (authoring periodic reports, presentations in biannual meetings) that will require overseas travel

Education, Experience, Knowledge and Competences required:

Education
PhD in in chemistry, chemical engineering, materials science, biochemistry, or equivalent

Experience:
- Demonstrable previous experience in the chemical synthesis and modification of carbon nanomaterials and graphene
- Extensive expert use of an array of physicochemical and materials characterisation tools (Raman, AFM, SEM, TGA, DLS, spectrophotometry, electron microscopy, HPLC, XPS)
- Excellent research and methodological skills relevant to the research theme (surface modification or chemical functionalisation of carbon nanomaterials)

Competences requires:
- Excellent organisational and time-management skills, including the ability to deliver timely and high quality outputs
- Ability to demonstrate scientific writing and communication skills
- Ability to be creative in research ideas to develop/progress the research area
- Ability to plan, organise, and undertake work without detailed supervision
- Ability to develop effective working relationships with all levels of staff, students and external contacts
- Ability to work under pressure and maintain a high degree of accuracy
- Excellent verbal and written communication skills
- Ability to work effectively in a multi-disciplinary team
- Ability to work independently, use own initiative, where appropriate, and be proactive in approach to work
- Ability and enthusiasm to learn new skills outside own discipline

Desirable:

- Experience in experimental research using of electron microscopy techniques (TEM, cryo-EM, tomography)
- Experience and direct involvement in projects funded by the European Commission (under H2020, FP7, or earlier Framework programmes)
- Previous hands-on research experience in handling and studying the biological investigation of carbon nanomaterials, in particular graphene, with biological matter (proteins, cells, tissues)
- Experience in culturing and genetic modification of mammalian cells.
- Experience with extraction and culture of primary cells and their culturing protocols
- Previous experience of applying for research funding
- Experience of supervising student research projects
- Evidence of a developing track record in publishing and dissemination of high quality publications in peer-reviewed journals

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: up to 30/09/2023
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.

Estimated Incorporation date: as soon as possible

How to apply:
All applications must be made via the ICN2 website https://jobs.icn2.cat/job-openings/410/research-associate-in-graphene-bioconjugate-chemistry and include the following:

1. A cover letter.
2. A full CV including contact details.
3. 2 Reference letters or referee contacts.

Applications will be continuously reviewed. Shortlisted candidates will be invited for interview.

Equal opportunities:
ICN2 is an equal opportunity employer committed to diversity and inclusion of people with disabilities.
ICN2 is following the procedure for contract of people with disabilities according with article 59 of the Royal Decree 1/2015, of 30 of October.