The Nanoscience Cooperative Research Center, CIC nanoGUNE, located in Donostia / San Sebastian, Basque Country (Spain), is currently looking for a

**PRE-DOCTORAL RESEARCHER**

to work on

**AI-Driven Spectroscopic Monitoring of Cell Cultures for Next-Generation Immunotherapies**

NanoGUNE is a research center devoted to conducting world-class nanoscience research for a competitive growth of the Basque Country. NanoGUNE is a member of the Basque Research and Technology Alliance (BRTA) and is recognized by the Spanish Research Agency as a María de Maeztu Unit of Excellence.

The **aim** of the proposed **research project** is to develop robust, data-driven analytical tools to monitor and optimize the manufacturing of advanced cell therapies. The work will focus on cell cultures undergoing controlled activation and differentiation, as typically performed in CAR T and other advanced therapeutic workflows. By applying Raman and surface-enhanced Raman spectroscopy (SERS), we will capture real-time metabolic fingerprints that reflect cellular states and responses throughout the bioprocess. These spectral data will be analyzed using multi-parametric machine learning and deep learning approaches, with the goal of predicting therapeutic potency, identifying process deviations early, and ultimately enabling feedback-driven control and enhanced consistency in cell therapy manufacturing.

The position is offered in the **Nanoengineering Group**, led by **Seifert, Andreas** (a.seifert@nanogune.eu). The group focuses on research at the interface between fundamental nanoscience and applied engineering, particularly in the area of photonic medical diagnostics, environmental issues, and food control. By introducing nanotechnology and photonic approaches, we bridge the gap between physical sciences and industrial as well as clinical applications to finally gain added value for novel biomedical methods, devices, and instrumentation. The acceleration of technology transfer is the driving motor for our research activities. **More information** can be found at: https://www.nanogune.eu/en/research/groups/nanoengineering

The candidate will join a research line focusing on the early detection of Alzheimer's, plasmonic detection of biomarkers, photonic monitoring of physiology and vital signs, as well as on the plasmonic supercrystals, and will take care of:

- Optimization of SERS sensors to achieve high reproducibility;
- Development of cell culture protocols for stable growth and differentiation;

- Systematic spectroscopic measurements on single cells and extracellular media;
- Holistic data analysis by machine learning;
- Development of feedback loops for improving the cell therapy.

The **successful candidate** will preferably have a master's degree in Biotechnology, Biomedical Engineering, Biophysics, Chemistry, or other related Engineering field, and should have experience in some of the following skills:

- Experience in cell culture and bioassays, with a particular interest in metabolic pathway analysis;
- Hands-on experiments in (bio)chemical laboratories;
- Knowledge in computer programming;
- Machine learning techniques;
- Fluent in written and spoken English.

Although not compulsory, the following points will be considered:

- Photonic data;
- Knowledge in optics, photonics, spectroscopic techniques;
- Experience with interdisciplinary research;
- Self-motivated and able to work in a team, coordination of research work.

We promote teamwork in a diverse and inclusive environment and welcome all kinds of applicants regardless of age, disability, gender, nationality, race, religion, or sexual orientation.

The position is expected to start in **01/08/2025** and for a total length of **up to 36 months** (01/08/2025 - 31/07/2028) in the Nanoengineering Group.

Candidates should **apply** by completing the **form below** and attaching the following documents:

a. A complete CV

b. A cover letter and at least two reference letters grouped in a single PDF file

The **deadline** for applications is **30/06/2025.**

*NOTES:*
*(i) All applicants will receive an answer after the end of the selection process; but please note that due to the large number of submissions that are expected, we cannot provide individual feedback.*
*(ii) Additional information about nanoGUNE's commitment towards HR excellence in Research and Gender Equality are available on our website.*
*(iii) We encourage you to subscribe to our HR mailing list to receive information related to nanoGUNE's open positions and open calls for different training and talent attraction programs.*