

RESEARCH ASSISTANT / PROSPECTIVE PhD CANDIDATE FOR THE FRAUNHOFER CENTER FOR APPLIED THERAGNOSTICS (RA02-FCAT)

1. Introduction to the position:

The Fraunhofer Spain Research foundation is looking for a RESEARCH ASSISTANT / PROSPECTIVE PhD CANDIDATE to join the Fraunhofer Center for Applied Theragnostics in Catalonia (Fraunhofer CAT) and contribute to a research project focused on the development of advanced in vitro intestinal models to study the early stages of colorectal cancer.

The position is intended to develop into a PhD project, providing the successful candidate with interdisciplinary training at the interface of cell biology, bioengineering, quantitative imaging and computational modelling.

The contract will be within the framework of the Fraunhofer CAT project, whose objective is the development of new diagnostic, prognostic and therapeutic tools in the field of precision medicine.

This project is funded by: Ministerio de Ciencia, Innovación y Universidades, Generalitat de Catalunya and Ajuntament de Barcelona.

2. Description of the position:

Colorectal cancer (CRC) is frequently initiated by mutations in the tumor suppressor gene APC, leading to constitutive activation of the Wnt signaling pathway and altered epithelial organization. Increasing evidence suggests that interactions between healthy and mutant cells, through processes such as cell competition, play a key role in the early stages of CRC development.

We are seeking a motivated and enthusiastic candidate to join an interdisciplinary research project investigating how healthy and APC-mutant intestinal epithelial cells interact and compete within engineered tissue environments. This project offers an exciting opportunity to study the cellular mechanisms underlying CRC initiation using state-of-the-art experimental models.

The successful candidate will work with advanced organoid-derived intestinal epithelial models that recapitulate key features of the native tissue. By combining these models with microengineered culture systems, live-cell imaging and quantitative image analysis, the project aims to uncover the cellular and tissue dynamics that govern cell competition during the earliest stages of colorectal cancer.

Under the supervision of the Fraunhofer CAT research staff, the applicant will carry out the following research activities:

- Development and characterization of advanced in vitro models of the intestinal epithelium using primary and organoid-derived cells.
- Design and implementation of experiments to investigate interactions and cell competition between healthy and APC-mutant intestinal epithelial cells.
- Use of microengineered and biomimetic culture platforms to control the spatial organization and microenvironment of intestinal epithelial tissues.
- Performance of live-cell and fluorescence microscopy experiments to monitor epithelial organization and dynamics at the cellular and tissue levels.
- Quantitative analysis of microscopy data, including cell and tissue segmentation, tracking and analysis of epithelial dynamics.

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- Contribution to the development and/or application of computational models and simulations to investigate epithelial dynamics and cell competition.
- Communicate results through scientific reports, publications, and presentations.
- Actively contribute to lab research and collaborations.

3. Requirements for candidates

Essential

- Master's degree in Bioengineering, Biomedical Engineering, Biophysics, Biotechnology, Cell Biology, Biomedicine, Physics or a closely related discipline.
- Strong interest in cell and tissue biology, quantitative biology, biophysics and/or bioengineering.
- Motivation to pursue a PhD in an interdisciplinary research environment.
- Interest in investigating biological questions through a combination of experimental and quantitative approaches.
- Ability to analyze and interpret quantitative experimental data.
- Ability to work independently while collaborating effectively within multidisciplinary research teams.
- Strong organizational skills, attention to detail and ability to prioritize tasks.
- Critical and analytical thinking and strong motivation to learn new experimental and computational approaches.
- Good communication skills.
- Excellent level of spoken and written English.

Advantageous

- Previous experience in mammalian cell culture, primary cell culture and/or organoid culture.
- Previous experience in fluorescence microscopy and live-cell imaging.
- Experience with image analysis and quantitative analysis of biological data.
- Experience with programming or scientific computing environments such as **Python, MATLAB or similar**.
- Previous experience with computational modelling or numerical simulations.
- Experience in microfabrication, microengineered culture systems or biomaterials.
- Knowledge of intestinal biology, epithelial dynamics, cancer biology or cell competition.

We Offer:

- Number of available positions: 1
- Starting date: As soon as possible
- Working conditions:
 - Full time open-ended contract due to technical and scientific activities linked to the project and budget duration. Presential. Attractive salary.
 - Measures to reconcile work and family life (maternity and paternity leave, flexible schedule working hours, 23 working days of paid holidays, 6 leave days for personal matters, among others).
- A stimulating and highly interdisciplinary research project combining advanced cell culture, organoid technology, microengineering, quantitative imaging and computational modelling.
- Access to advanced research infrastructure and interaction with a multidisciplinary network of researchers in bioengineering, cell biology, cancer research and computational modelling.
- Opportunities for scientific training, participation in international conferences and research collaborations.

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- Fraunhofer Spain Research ensures equality of access to professional development opportunities irrespective of employment status or other factors.
- Stimulating, interdisciplinary research and high-quality international scientific environment.
- Induction programme to facilitate incorporation at Fraunhofer Spain Research and additional support is provided for foreigners to obtain Visa-working permit and to install in Barcelona.

How to apply:

Until the 31st of August, by sending a CV and motivation letter to info@fraunhofer.es with the reference “RA02-FCAT” as subject of the email.

Only those applications submitted before the deadline will be evaluated.

Reference: RA02-FCAT

If you have any further questions regarding your application or the application process, please get in touch with us at info@fraunhofer.es

Principles of the selection process:

Fraunhofer Research Spain Foundation is committed to the principles of the Code of Conduct for the Recruitment of Researchers of the European Commission and the Open, Transparent and Merit based Recruitment principles (OTM-R).

Fraunhofer Research Spain Foundation’s commitment on equal opportunity: our strength and excellence as an international transdisciplinary research institute are based on diversity. Being an equal opportunity employer, we are committed to diversity and inclusion, so that we support employees irrespective of their gender, nationality, religion, disabilities, age, sexual identity or cultural and socioeconomic background.

Fraunhofer Research Spain Foundation aims for a representative gender balance at all levels of staff, so we strongly encourage women to apply. At least 40% of shortlisted applicants invited to interview have to be women with comparable level of CVs as the male candidates.

Protection of personal data:

Fraunhofer Spain Research Foundation guarantees that candidates’ personal data are processed in accordance with the requirements of the EU General Data Protection Regulation (GDPR) and Law 3/2018 on Data Protection.

Personal data will be processed solely for the purposes of the selection process.

Who we are?

The Fundación Fraunhofer Spain Research (Fraunhofer Spain) is a non-profit private Spanish Foundation, established in Barcelona in 2025 as an affiliate of Fraunhofer-Gesellschaft, Europe’s leading organization for applied research (<https://www.fraunhofer.es/>).

Our mission is to conduct independent research activities, including training, knowledge dissemination, and technology transfer. These activities range from basic research to prototype development and small-scale production, strengthening the internationalization of applied research and connecting academia with productive sectors.

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Fraunhofer Spain Research has launched its first program in applied bioengineering for health: the Fraunhofer Center for Applied Theragnostics (Fraunhofer CAT). This initiative is dedicated to developing innovative diagnostic, prognostic, and therapeutic tools within the field of precision medicine. The program aims to generate significant academic, industrial, and healthcare impact, ultimately contributing to societal well-being.

Fraunhofer Spain was founded by Fraunhofer-Gesellschaft, the largest organisation for applied research in Europe with the economic support of the Spanish Government (Ministerio de Ciencia, Innovación y Universidades), the Barcelona City Council (Ajuntament de Barcelona), and the Catalan Government (Generalitat de Catalunya), as well as the academic collaboration of Barcelona University, the Institute for Bioengineering of Catalonia (IBEC) and Fraunhofer Institute for Biomedical Engineering (Fraunhofer IBMT).

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