

Financiado por:



GOBIERNO DE ESPAÑA

MINISTERIO DE CIENCIA E INNOVACIÓN



Plan de Recuperación, Transformación y Resiliencia



Next Generation Catalunya



Generalitat de Catalunya  
Departament de Recerca i Universitats



## **Research Assistant on Medical 3D printing and planning bioengineering**

With the aim to recruit research staff for the implementation of one of the sixteen "Collaborative Projects" selected in Catalonia within the framework of the Complementary Plan for Biotechnology in Catalonia, this selection process is opened. This Complementary Plan is co-funded by the Ministry of Science and Innovation and the Generalitat de Catalunya under the C17.I1 of the Recovery, Transformation and Resilience Plan (PRTR).

### **1. Introduction to vacant position:**

Sant Joan de Déu Hospital (HSJD) is looking for a 3D printing and planning bioengineer to work on a project focused on the development of advanced solutions for the training and simulation of surgical skills for complex paediatric oncologic surgery cases. This advanced solution will be based on digital and physical models using technologies such as Virtual reality, augmented reality and 3D printing.

This project led by HSJD will be co-developed with Fundació CIM UPC Barcelona Tech (CIM UPC) and the Servicio de Cirugía Pediátrica Hospital Regional Universitario de Málaga (HRUM).

Paediatric surgery is the medical specialty in charge of the diagnosis and management of surgical pathology in children and adolescents. In general, this discipline is characterized by having a wide range of conditions to be solved, but with low frequencies, since children grow and develop, thus changing the diseases that afflict them. On the other hand, this group is much smaller than the adult population as a whole, which also contributes to the need for surgeons to have many skills and tools that cannot always be trained. In this context, childhood cancer becomes especially complex when cases present in different geographic settings, dispersing the experience and becoming challenging for the surgical teams that receive them. Having professional training systems that allow specific skills to be trained prior to interventions and even to do so with the particular pathology of each patient is necessary and is expected to have an impact on clinical outcomes, safety and standardization of results.

The contract will be within the framework of the "Virtual and augmented reality and 3D printing for surgical planning of complex surgeries in paediatric oncology and creation of surgical simulation models for training" (**3DSurgHELP**) project prioritized by the IBEC under the "Plan Complementario de Biotecnología aplicada a la Salud" (*biotechnology applied to health*).

This Plan Complementario is co-financed by the Ministerio de Ciencia e Innovación and the Generalitat de Catalunya, with funds from the European Union NextGenerationEU (PVXXV135 ; 25-

### **2. The successful candidate will develop research involving:**

Under the direction of Lucas Krauel (HSJD) as PI and technical supervision of Arnau Valls (HSJD), the main tasks to be performed within the project by the selected person will be:

- Participation in the development of virtual (CAD) and physical simulation models of complex paediatric cancer cases (neuroblastoma, hepatoblastoma, etc).

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- Segmentation of the medical image (DICOM), post-processing, and CAD reconstruction.
- Work with virtual reality and augmented tools and software to generate virtual simulators for the training of skills of oncologic surgeons.
- Work with 3D printing, mouldage techniques and manufacturing techniques for the production of a physical simulation model for the training and evaluation of skills of oncologic surgeons.
- Organize and participate on the clinical validation of the simulators (digital and physical) developed in training sessions with oncologic surgeons in HSJD and HRUM.

The selected person will be part of a team made up of members of the HSJD and CIM UPC. He/She will perform the activity at HSJD and will interact with CIM UPC and HRUM.

### 3. Requirements for candidates

#### Essential

- Master in Biomedical Engineering, Mechanical Engineering, Industrial Technology Engineering or Industrial Engineering or Telecom Engineering.
- Experience with CAD/CAM technologies.
- Experience in the post-processing of the medical image (segmentation of DICOM, surgical planning...).
- Competencies and skills: Communication, Teamwork and collaboration, Commitment, Proactivity, Integrity, Critical and Analytical thinking
- High level of English

#### Advantageous:

- Experience in fields related to biomechanics, materials or health sciences will be appreciated.
- Experience with medical image processing (3D Slicer, Mimics, 3Matic, MeshLab) will be appreciated.
- Experience with virtual and augmented reality image processing software (Unity, Mimics, other) will be appreciated.
- Experience in 3D printing technologies will be appreciated.

#### **We Offer:**

- Number of available positions: 1
  - Starting date: Between 1st of April and the 16<sup>th</sup> of June 2023
  - Working conditions:
  - Full time 18-month contract. Attractive salary
  - Measures to reconcile work and family life (maternity and paternity leave, flexible schedule working hours, teleworking, 23 working days of paid holidays, 9 leave days for personal matters, among others).
  - Stimulating, interdisciplinary research and high-quality international scientific environment.
  - IBEC ensures equality of access to professional development opportunities irrespective of employment status, length at IBEC or other factors. The IBEC's yearly training catalogue offers a wide range of training in technical and transferable skills including mobility grants and a Mentoring programme for predoctoral and postdoctoral researchers.
  - Induction programme to facilitate incorporation at IBEC and additional support is provided for foreigners to obtain Visa-working permit and to install in Barcelona.
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## How to apply:

Until February 10<sup>th</sup> an [online application form](https://careers.ibecbarcelona.eu/) is available through IBEC dedicated site: <https://careers.ibecbarcelona.eu/>

Only those applications submitted before the deadline will be evaluated.

## Reference: PPCC-3DSurgHELP

If you have any further questions regarding your application or the application process, please get in touch with us at [jobs@ibecbarcelona.eu](mailto:jobs@ibecbarcelona.eu)

If you have any questions regarding a project or the Complementary Plan, please get in touch with us at [planescomplementariossalud@ibecbarcelona.eu](mailto:planescomplementariossalud@ibecbarcelona.eu)

## Principles of the selection process:

IBEC 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).

IBEC'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."

## Protection of personal data:

IBEC 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 Institute for Bioengineering of Catalonia, IBEC is an interdisciplinary research center focused on Bioengineering and Nanomedicine based in Barcelona. IBEC is one of the top research institutions named

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as a Severo Ochoa Research Centre by the Ministry of Science, Universities and Innovation, which recognizes excellence at the highest international level in terms of research, training, human resources, outreach and technology transfer.

IBEC's mission is to develop international high-quality interdisciplinary research that, while creating knowledge, contributes to making a better quality of life, improving health and creating wealth. A close link with key universities, reference hospitals and corporations, are assets that facilitate achieving the mission.

IBEC was established in 2005 by the Generalitat de Catalunya (Autonomous Government of Catalonia), the University of Barcelona (UB) and the Technical University of Catalonia (UPC).

IBEC is located within the Barcelona Science Park and is managing 3.800 square meters facilities, with an annual budget of 13 Mio€; 3.800 square meters of facilities; 21 research groups and a team of researchers and support services of 350 people from 30 different countries. [www.ibecbarcelona.eu](http://www.ibecbarcelona.eu)