INDUSTRIAL DOCTORATE
(REF.: ID_ME_20)

The Josep Carreras Leukaemia Research Institute (IJC) is a non-profit research institute based in Barcelona and dedicated to advancing our understanding about leukaemia and related disorders, in partnership with the University of Barcelona and University Autònoma of Barcelona. The IJC has laboratories in three clinical campuses: i) Clinic Hospital, ii) Sant Pau Hospital and iii) Germans Trias i Pujol Hospital. IJC serves as a collaborative hub for basic investigators and physicians to work together on fundamental biological and clinical aspects of leukaemia. The IJC offers an excellent work environment built around a multi-disciplinary fusion of ideas and state-of-the-art facilities.

IJC is seeking for a highly motivated candidate to enroll in an **Industrial Doctorate** to collaborate in the **Manel Esteller** Research Group, and the Startup **VRInstruments.**

Research Description

The group continues the wide-ranging work on epigenetics that Manel Esteller, has carried out during his career, devoted to the establishment of the epigenome and epitranscriptome maps for normal and transformed cells. His laboratory pioneered the observation that epigenetic disruption of mRNA transcription, related to DNA methylation and histone modification patterns, contributed to cancer (Esteller, NEJM 2008; Heyn and Esteller, Nat Rev Genet 2012). His lab characterized the first ncRNAs undergoing specific cancer-methylation associated silencing (Cancer Res 2007; PNAS 2008; Oncogene 2012, Oncogene 2010; NSMB 2012; Mol Cell 2014; PNAS 2016, Genome Biol 2016; Oncogene 2017; Leukaemia 2019).

The lab has also a strong interest in the establishment of new epigenomic platforms to elaborate comprehensive DNA methylome maps (Epigenetics 2011; Epigenomics 2016). The use of these approaches has made several breakthroughs in lung cancer (JCO 2010), Cancer of Unknown Primary (CUP) (Lancet Oncology 2016); and anti-PD1 immunotherapy (Lancet Respiratory Medicine 2018).

Interestingly, the “repertoire” of epigenetic modifications of DNA is fairly limited, (Heyn and Esteller, Cell 2015). In sharp contrast, more than one hundred post-transcriptional modifications occur in RNA (Esteller and Pandolfi, Cancer Discov 2017; Cell 2018). In this field, the group has shown aberrant RNA modifications and epitranscriptomes in different tumour types (Oncogene 2016; Leukaemia 2017; Acta Neuropathol 2019; Oncogene 2019).

Finally, the group has a long-standing interest in translating the epigenetic knowledge gained to clinical outcome and therapy response prediction (Nature Comm, 2014; JNCI , 2014; Oncotarget 2015; JCI Insight 2019) and to assay new epigenetic drugs (Oncogene 2012; Oncotarget 2017; Haematologica 2018) to reverse the distorted cancer landscape (Berdasco and Esteller, Nat Rev Genet 2019).

Please also visit our group webpage:
https://www.carrerasresearch.org/en/cancer-epigenetics_124284

Company Overview

VRInstruments fuses the most disruptive Biomedical and Scientific 3D Imaging Instruments with Virtual Reality, aiming for the most sophisticated interaction with and improvement of cutting edge bio-imaging data, with the application of Artificial Intelligence.

Besides the data visualization, we are concerned in improving processing algorithms and data analysis to make the most of the 3D bio-imaging data, by also providing collaborative interfaces that enhances and accelerates the path from basic to applied science and vice-versa (translational medicine).

What we need?

- Degree in Medicine, Computer Science, Physics, Biology, Mathematics, or similar.
- Master in Translational Medicine, Nanoscience and Nanotechnology, Bioinformatics, Artificial Intelligence, Genetics, or similar.
- Proficient in writing and speaking in English.
- Catalan and Spanish will be an asset.
- The average mark of the studies that allow access to the PhD Program should be between 6.5 and 10.
- High confidence in C/C++/C# and/or other programming languages.
- Knowledge of direct nanoscale (molecular scale) analytical tools (i.e nanoscopy) applied to molecular/genetic diseases.
- Low level CPU and GPU programming (CUDA) (valuable). Artificial Intelligence knowledge (valuable).
- Python, R, Matlab, and/or other scientific languages knowledge (valuable). Proposal writing experience (valuable). Labview knowledge will be an advantage.
- Communication skills, autonomy, proactivity and team work skills.
- Previous work experience:
    - Research assistant fellowships in any of the fields of the required degrees will be valued.
    - Other fellowships and/or contracts in private sectors (i.e. in A.I.) will also be an added value.
    - Innovation consultancy and/or proposal writing experience will also be considered as a plus.

Main Responsibilities

The PhD student tasks will include but are not be limited to:

1) Get training in the basic instrumentation for genetic analysis in IJC, both indirect and mainly direct (microscopy) and getting documented with the state-of-the-art processing, visualization and analysis tools having access to top journal articles. A deeper knowledge in advanced nanoscopy instruments through optional secondments in the Cambridge University and ICFO.

2) Getting transversal skills of technology transfer that will be provided by the fellowship management and by the company (for instance innovation proposal writing, patent managing, company regulations, etc.).

3) The core of the project will be to work on a programming toolchain for processing, visualization and analysis of 3D molecular bio-images applied to cancer epigenetics on the cloud (using mainly IBM POWER9, Intel x86 and Tesla (CUDA) architectures).

4) Obtain cutting edge experimental epigenetics data and process it, building an application with the help of the programming toolchain, to tackle a relevant cancer epigenetic problem (with optional secondments in the University of Cambridge and ICFO).

5) The final stage will be to write and defend the Phd Thesis with all the research results.

What we offer?

- We offer the opportunity to contribute to cutting-edge research projects in a competitive and dynamic international environment.
- The international network of the Esteller lab.
- Temporary contract: 3 years
- Start date: June - September 2020
- Working in the mixed basic and clinical research environment of the Josep Carreras Leukaemia Research Institute.
- The stimulating environment of the Barcelona metropolitan area.

For more information, please visit the Regulatory bases.

How to apply?

Candidates must send an updated CV with the contact details of 2 referees, a motivation letter to jobs@carrerasresearch.org indicating in the subject of the message: **REF.: ID_ME_20**

Deadline for Applications:

Deadline expression of interest: may 28th 2020

Who we are?

Our mission is to carry out research into the basic, epidemiological, preventive, clinical and translational aspects of leukemia and other hematologic malignancies.

The vision of the Josep Carreras Leukaemia Research Institute is that research will identify new therapeutic targets and enable us to develop more precise and less aggressive treatments. We aspire to understand the origin and development of leukemias and other malignant haematological pathologies in order to be able to prevent them. We will work for a future in which all leukemias will be curable.

For further information, please, visit our webpage: http://www.carrerasresearch.org/en and the Josep Carreras non-profit organization: https://www.fcarreras.org/en

The Josep Carreras Institute is member of the Research Centers of Excellence of Catalonia (CERCA, Catalan Government), also accredited by the Spanish Ministry of Health as Health Research Centre of Excellence (ISCIII) and by the Spanish Association Against Cancer (Asociación Española contra el Cáncer, AEEC). The institute also holds the HR Excellence in Research recognition awarded by the European Commission.

The European Commission awarded the IJC the HR Excellence seal in July 2019. The IJC continues to work to maintain its policies in line with the Charter and Code principles.

The HRS4R has the main objective of ensuring that research centers of excellence implement and respect the requirements of the European Charter for Researchers and the Code of Conduct for hiring researchers (from here on referred to as the Charter and Code) within their human resources policies.

This EC initiative aims to promote training, professional development, and mobility for all European scientists. The IJC supports these values and principles, which will not only serve to strengthen its internal policies but will actively stimulate excellent research and firmly situate the organization as an institution with a stimulating working environment that favours the development of its scientists.

IJC is an equal opportunity employer. We evaluate qualified applicants without regard to race, colour, religion, sex, national origin, disability, and other legally protected characteristics.