UNIVERSITÀ DEGLI STUDI DI MILANO

FELLOWSHIP – Epigenetic profiling of meningioma patients

A 21-months fellowship ("Assegno di ricerca", junior post-doc level) is available in the **Bonaldi laboratory** (https://orcid.org/0000-0003-3556-1265) at the University of Milano/ Department of Experimental Oncology of the European Institute of Oncology (IEO) in Milano, for research work on the epigenetic profiling in liquid biopsy for personalized medicine in meningioma patients, in the context of a PRIN research project in collaboration with University of Piemonte Orientale (Prof. G. Pelicci) and Istituto Neurologico Besta (Prof. Di Meco).

The position will be assigned through a ministerial competition in which participants must hold a research doctorate. Please visit the following site for application: https://www.unimi.it/it/ricerca/ricerca-lastatale/fare-ricerca-da-noi/assegni-e-borse/bandi-assegni-di-ricerca/bando-di-tipo-b-dottssa-bonaldi-id-5965 con scadenza 17 novembre

Deadline is **November 17th 2023**

The specific research project, supported by Ministero della Universita' e Ricerca (MUR)/PRIN, that the fellow will join, is outlined below.

Epigenetic profiling and liquid biopsy: perspectives for personalized medicine in meningioma patients
ACRONYM: MIND: Meningioma epIgeNetic liquiD biopsy

Meningiomas are the most frequent primary intracranial tumours, accounting for 38% of all cases and determining 32% of all deaths due to central nervous system malignancies. They are classified according to the World Health Organization (WHO) grading system into three grades: grade 1 meningiomas are usually benign (90% of cases), grade 2 comprise atypical tumors (5–15%) and grade 3 include anaplastic tumors (1–3%). While being the most diffused stratification algorithm to guide the therapeutic approach and bearing prognostic value, the WHO classification has limitations. For instance, grade 1 meningiomas can recur or invade locally, while higher grade meningiomas can have an indolent clinical course. The other existing predictor associated with time of recurrence in meningiomas is the extent of tumor resection at surgery (Simpson scale). Although both are basically associated with recurrence rates on a population, they are limited by the interrater variability of grading and considerable within-grade variation of recurrence risk for individual patients. Consequently, the treatment of meningiomas is still discussed case by case, commonly on the basis of previous experiences and low-level evidence. An evidenced based and personalized approach still represents a major unmet clinical need. Hence, it is crucial to achieve a better insight in the molecular biology of these tumors, allowing to stratify patients and to select the therapeutic approach according to molecular signatures. Elaborating on recent publications linking epigenetic features to meningioma classification, we propose to simultaneously investigate histone post-translational modifications and DNA methylation as tools for meningioma patient stratification. To this aim, we will take advantage on our recognized expertise in systematic epigenetic profiling of cancer patients by mass spectrometry (MS) and in extracellular vesicles characterisation from brain cancer patient plasma. The specific goals of this project are: 1) defining a novel epigenetic signature based on MS-profiling of a retrospective cohort of formalin-fixed paraffin embedded tissue samples, for classification and recurrence prediction; 2) validating such signature on circulating nucleosomes, from liquid biopsies collected prospectively, 3) assessing the DNA-methylation predictive signature from plasma-derived extracellular vesicles; 4) developing a machine learning algorithm for the integration of epi-proteomics data, DNA-methylation profiles and clinico-pathological information, to generate a potent molecular classifier and predictor.

The successful completion of this project will generate crucial knowledge that will enable tailoring the treatment of meningioma patients in an unprecedented, personalized, shared and non-invasive way

Within a highly multi-disciplinary project whereby MS-based histone modification profiling, proteomics DNA-methylation analysis on primary patient samples,we are seeking for highly motivated applicants, with a background in molecular and cellular biology who will contribute to the setup and application of the analytical platform for epigenetic characterization of meningioma patients.

Requisites of the candidate:

- *PhD degree in Molecular and Cellular Biology, Biotechnology, Biochemistry, Molecular Oncology, Systems Medicine or related disciplines;*
- *Expertise in* ***biochemistry and cellular biology techniques****;*
- ***Experience in epigenomics and -omics analyses is highly appreciated but not a necessary pre-requisite for CV evaluation;***
- *Good knowledge of the English language;*
- *Reliability, precision;*
- *Excellent communication skills and strong attitude toward team work*

Lab Site:

Tiziana Bonaldi's research lab is located at the **European Institute of Oncology,** one of Europe's most influential cancer research institutes. The IEO operates as a Comprehensive Cancer Center, linking fundamental and applied research to clinical activities, patient care and clinical trials. The department of Experimental Oncology (DEO) is currently composed of ~250 scientists working in 15 independent research groups and units. DEO is located within a scientific campus together with two other partner institutions: the FIRC Institute of Molecular Oncology (IFOM) and the Italian Institute of Technology (IIT). The IEO is one of the 13 members of the **EU-LIFE alliance** to promote excellence in life sciences in Europe. The operating language of the lab is English.
IEO is an **equal opportunity employer**, committed to excellence through diversity

Contact:

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