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TEMPLATE RICHIESTA ATTIVAZIONE TOPIC AGGIUNTIVI SU FONDI PNRR

D.M. 9 aprile 2022 n. 351

Project title/Titolo del Progetto	**Define the role of microenvironment in hepatocarcinogenesis.**
Principal Investigator	Roncalli Massimo/ Terracciano Luigi
Main field of interest/Ambito principale di ricerca	Bioinformatics, high-dimensional Omics data analysis, liver cancer
Abstract	Hepatocellular carcinoma (HCC) accounts for 75-85% of all primary liver malignancies. The tumor microenvironment (TME) of HCC is complex and is composed of many different cells, including immune cells, fibroblasts, endothelial cells, among others. The complexity of this microenvironment is the result of the interaction of many factors, such as the presence of the different cell types, the hierarchical structure between cells, and transcriptional activity in response to changes in the microenvironment. To define the alterations in the TME over the course of hepatogenesis, we will perform single-cell RNA-sequencing profiling and single-cell ATAC-seq of normal liver, non-tumor liver (cirrhosis) and HCC. We will quantify the extent of intra-tumor and inter-tumor cell-to-cell variability, define the altered cellular interactions and elucidate the altered gene regulatory networks to achieve a systemic understanding of the tumor ecosystem and the changes associated with hepatogenesis.
Type of Co-funding	○ D.M. 351/2022 - Borse di dottorato per la transizione digitale
Lab name and address	Pathology
Brief description of the coherence of the Project in relation to the PNRR objectives[3]	The present project aims to understand the tumor ecosystem thus favoring the development of innovative therapeutic approach to perform precision medicine. The project will be developed in institution with great expertise in liver pathology, tumor microenvironment and bioinformatics and is coherent and consistent with the Ph. D. program. Data and new pipeline developed will be published on public repositories as Zenodo and GitHub respectively. Open access publication will be preferred as possible. The project will meet the aim of the PNRR in particular will fill the gap of technical skills in the research.

N. of months abroad (min. 6, max. 18) [**compulsory**]	10
Name of the research institution/company abroad	University of Basel, Department of Biomedicine, Visceral Surgery and Precision Medicine laboratory (PI: Piscuoglio)
N. of months of internship (min. 6, max. 18) [compulsory only for D.M. 352/2022]	0
Name of the company[3]	NA
Scientific references	1. Neophytou, C. M., Panagi, M., Stylianopoulos, T. & Papageorgis, P. The Role of Tumor Microenvironment in Cancer Metastasis: Molecular Mechanisms and Therapeutic Opportunities. Cancers 13, (2021). 2. Frankel, T., Lanfranca, M. P. & Zou, W. The Role of Tumor Microenvironment in Cancer Immunotherapy. Advances in Experimental Medicine and Biology 51–64 (2017). doi:10.1007/978-3-319-67577-0_4
Type of contract	PhD scholarship of € 18.000 gross per year awarded by Humanitas University. This sum is exempt from IRPEF income tax according to the provisions of art. 4 of Law no. 476 of 13th August 1984, and is subject to social security contributions according to the provisions of art. 2, section 26 and subsequent sections, of Law no. 335 of 8th August 1995 and subsequent modifications.