PHYSICIAN SCIENTIST
LA MEDICINA INCONTRA LA RICERCA
promosso da: AIRC Fondazione CARIPLO | con il supporto di: IEMM Istituto Europeo di Oncologia UNIVERSITÀ DEGLI STUDI DI MILANO

2026 Physician Scientist Call

AVAILABLE POSITIONS

Principal Investigator	CAVALLARO UGO
Institute of Affiliation	Istituto Europeo di Oncologia I.R.C.C.S. S.r.l.
Title of the proposed project:	Unraveling the ovarian cancer immune microenvironment and its response to immunotherapy through patient-derived models
Short description of the project	High-grade serous ovarian carcinoma (HGSOC) is a highly lethal tumor type, mainly due to the frequency of tumor relapse and acquired chemoresistance. As its prognosis has changed negligibly in the last thirty years, there is an acute need to identify new therapeutic targets and prognostic biomarkers that can improve HGSOC management. In this context, immunotherapy approaches based on immune checkpoint blockade have improved significantly the outcome of different tumor types. However, the response of HGSOC to such treatments remains unsatisfactory, and a deeper understanding of tumor biology is mandatory to design better immunotherapy strategies. HGSOC progression is driven by a subpopulation of ovarian cancer stem cell (OCSC, also defined as tumor-initiating cells) which, due to their intrinsic biological features, are able to overcome the chemotherapy cytotoxicity and to fuel peritoneal dissemination and tumor relapse, thus emerging as an ideal target for OC eradication. We have recently uncovered a molecular axis whereby the cancer-associated vasculature modulates the OCSC pathophysiology and, in particular, confers them with an immune-modulatory phenotype. The PhD project will capitalize on a platform of patient-derived experimental models, consisting of tissue explant cultures that preserve the original tumor microenvironment, including the immune compartment. This will enable the PhD student to: 1. Dissect the molecular basis of OCSC-driven rewiring of tumor immunity. 2. Identify molecular/cellular features of the vasculature/OCSC/immune axis in patient-derived models and investigate their potential role as clinically relevant biomarkers. 3. Explore the involvement of OCSC-dependent rewiring of tumor immunity in immunotherapy response, possibly unveiling actionable vulnerabilities to sensitize the tumor. This project is, therefore, poised to provide novel insights into HGSOC biology and to pave the way to innovative treatments to improve the outcome of such a devastating disease. The clinical duties of the PhD student will be carried out at the Istituto Europeo di Oncologia, Milano.
Main research area for the project	Cancer biology
5 key words for the project	Tumor-stroma interaction, Immunotherapy, Cancer stem cells, Ovarian ca., Immune escape

LAB INFO	
Main topic/s of the lab	The pathophysiology of ovarian cancer

Short description of the lab activity	The lab focuses on the following objectives: 1) Defining the functional role of ovarian cancer stem cells in HGSOC dissemination, relapse and therapy resistance. 2) Dissecting the crosstalk between tumor cells and their micronvironment, with particular focus on the role of the peritoneal niche and the tumor vasculature on the pathogenic function of ovarian cancer stem cells. 3) Identifying gene variants in the homologous recombination machinery that influence the response to PARP inhibitors. 4) Characterizing molecular drivers and biomarkers associated with the response of ovarian cancer to PARP inhibitors or immunotherapy. These objectives are pursued mainly through the following activities: - Setup and characterization of different patient-derived experimental platforms, including both organotypic models of cancer cells (and cancer stem cells) co-cultured with components of the tumor microenvironment and tumor explants where tumor-associated immunity can be investigated. - A wide range of cell biology, molecular biology and functional assays aimed at obtaining mechanistic insights into ovarian cancer malignancy as well as defining drivers and biomarkers of therapy response/resistance. - The application of different omics technologies, ranging from epigenomics and transcriptomics (also at single-cell resolution) to classical and functional proteomics, in order to define molecular patterns associated to specific features of the disease and/or to identify biomarkers.
Recent bibliography	- Integrated molecular profiling of patient-derived ovarian cancer models identifies clinically relevant signatures and tumor vulnerabilities. INT J CANCER 2022 Jul; 151: 240 - L1CAM promotes ovarian cancer stemness and tumor initiation via FGFR1/SRC/STAT3 signaling. J EXP CLIN CANC RES 2021 Oct; 40: 319 - Matrix Gla Protein drives stemness and tumor initiation in ovarian cancer. CELL DEATH DIS 2023 Mar; 14: 220 - Tumor microenvironment-induced FOXM1 regulates ovarian cancer stemness. CELL DEATH DIS 2024 May; 15: 370 - Quantitative proteomics and phosphoproteomics analysis of patient-derived ovarian cancer stem cells. MOL CELL PROTEOMICS 2025 May; 24: 100965
Group composition	The Cavallaro group currently includes 12 members: 1 PI, 1 staff scientist, 3 postdoctoral fellows, 3 PhD students, 1 junior bioinformatician and 2 research technicians.
Institutional page link	https://www.research.ieo.it/
Lab website link	https://www.research.ieo.it/research-and-technology/principal-investigators/unit-of-gynecological-oncology-research/
Social media links	https://www.linkedin.com/in/ugo-cavallaro-87454524/