European School of Molecular Medicine

2025 summer call PhD selections

AVAILABLE POSITIONS

Principal Investigator	Luca Mazzarella
Affiliation	European Institute of Oncology, Milan
Title of the proposed project:	Genetic determinants of microtubular damage repair and its impact on cancer treatment and neurodevelopmental disorders
Short description of the project	The project will build on our recent work on NF1 (Duso et al, 2025 biorxiv, under review at Nature), a tumor suppressor frequently mutated in multiple tumors and in the neurodevelopmental syndrome neurofibromatosis. We found a novel function for NF1 in microtubular damage repair, a recently identified phenomenon implicated in mitosis, aging and neural development which remains poorly characterized. Disruption in microtubular damage repair may be targeted pharmacologically. The candidate will integrate clinical data, genetic screens by CRISPR/base editing, structural biology and advanced microscopy.
Main research area for the project	Genomic Medicine
Second research area for the project	Structural Biology
3 key words for project:	Microtubular damage, base editing, high resolution microscopy
Main topic/s of the lab	Cancer genomics, CRISPR/Cas9 and base editing, biomarker discovery, immunotherapy, chromatin and epigenetics
Short description of the lab activity	We believe that cancer can be understood and managed only by a multi-layered approach where methods originating from multiple disciplines are integrated. These include laboratory techniques, high-throughput sequencing, clinical trial design, social sciences, with a heavy reliance on computational analyses. We are creating a group of enthusiastic people with variegated backgrounds to foster cross-fertilization from different branches of knowledge, to provide comprehensive answers to clinically and biologically relevant questions. We participate in several collaborations within IEO and national and international groups.
Recent bibliography	1. Duso et al, *NF1 modulates microtubule repair and sensitivity to antibody-drug conjugates* 2025 biorxiv (under revision at Nature) 2. Borcoman et al, *Efficacy of pembrolizumab and vorinostat combination in patients with recurrent and/or metastatic squamous cell carcinomas: a phase II basket trial*, **Nature Cancer** 2025, Jun 30. doi: 10.1038/s43018-025-01004-2 3. Baragli et al, *PoreMeth2: decoding the evolution of methylome alterations with Nanopore sequencing.* **Genome Research**, 2025, in press 4. Di Chiaro et al, *Mapping functional to morphological variation reveals the basis of regional extracellular matrix subversion and nerve invasion in pancreatic cancer* **Cancer Cell** 2024, Mar 18:S1535-6108(24)00079-5 Favalli V et al, *Machine learning-based reclassification of germline variants of unknown significance: the RENOVO algorithm*, **Am J Hum Gen**, 2021 Apr 1;108(4):682-695
Group composition	The group welcomes researchers at various stages of seniority and with different backgrounds. It currently includes 2 postdocs (1

	bioinformatician), 4 PhD students (1 bioinformatician), a part-time MD and a technician.
Institutional page link	https://www.research.ieo.it/research-and-technology/principal-investigators/luca-mazzarella/