European School of Molecular Medicine

2026 summer call PhD selections

AVAILABLE POSITIONS

Principal Investigator	Stefano Casola
Institute of Affiliation	IFOM-The AIRC Institute of Molecular Oncology

PROJECT INFO	
Title of the proposed project:	Unraveling novel biology behind immunoglobulin heavy chains in aggressive B cell lymphomas.
Short description of the project	The B cell receptor (BCR), consisting of paired immunoglobulin (Ig) heavy and light chains complexed with CD79A and CD79B signaling subunits, controls survival and differentiation of normal B cells and contributes actively to malignant B cell transformation. We have recently reported that aggressive B cell lymphomas carrying MYC and BCL2 chromosomal translocations recurrently silence the BCR and irreversibly extinguish Ig light chain expression. However, these tumors retain expression of potentially productive Ig heavy chains. Preliminary work suggests that unpaired Ig heavy chains in Ig-light-chain-deficient lymphomas retain a pro-tumoral function selected by malignant B cells, whose molecular nature remains unknown (Varano et al., Blood Cancer Discov. 2025). The candidate PhD student will engage in functional studies including CRISPR/Cas9 genetic screening, cell biology assays, and ultrastructural analyses to map the subcellular distribution of IgH chains in BCR-silenced lymphoma models and to reveal the mechanism through which unpaired IgH chains support optimal lymphoma fitness.
Main research area for the project	Cancer Biology
Second research area for the project	Immunology
3 key words for the project	B cell receptor, lymphoma, germinal center.

LAB INFO	
Main topic/s of the lab	Understand the genetic and epigenetic determinants controlling B cell diversification and maturation, their ability to respond to foreign pathogens by selecting clonal variants expressing high-affinity antibodies, and the mechanisms driving malignant B cell transformation.

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Short description of the lab activity	Our lab investigates the mechanisms regulating B cell development and immune responses, and how these mechanisms become dysregulated during B cell lymphomagenesis. A major focus is understanding how the B cell receptor (BCR) shapes B cell fate and immunity, and how it contributes to lymphomagenesis. We address these questions by applying functional genetics in genetically engineered mouse models (including Cre/loxP technology) and human preclinical lymphoma models based on the genetic engineering of primary human B lymphocytes. We maintain long-standing collaborations with major clinical centers in Italy and Europe, working with pathologists and oncologists to cross-validate findings from preclinical models with real-world data obtained from lymphoma patients.
Recent bibliography	Casola S, Varano G. The B-cell receptor blueprint in lymphoma: mechanisms and therapeutic opportunities. *Blood Cancer Discovery.* 2026; doi:10.1158/2643-3230. – Lonardi S et al., Casola S. RAG1/2 expression in IGH-switched follicular lymphoma associated with transformation to HGBCL. *Leukemia.* 2026; doi:10.1038/s41375-026-02896-4. – Varano G et al., Casola S. B-cell receptor silencing reveals the origin and dependencies of HGBCL with MYC and BCL2 rearrangements. *Blood Cancer Discovery.* 2025; doi:10.1158/2643-3230.BCD-25-0099. – Varano G et al., Casola S. The B-cell receptor controls fitness of MYC-driven lymphoma cells via GSK3β inhibition. *Nature.* 2017; doi:10.1038/nature22353.
Group composition	Our group currently consists of one postdoctoral fellow, two PhD students, a senior staff scientist, a research fellow, a data analyst, a lab technician, and a master's thesis student.
Institutional page link	https://www.ifom.eu/en/cancer-research/researchers/stefano-casola.php