

Irene Casalin – Curriculum Vitae

Date of birth: 22 October 1998

Place of birth: Forlì, Italy

Citizenship: Italian

Email: irene22casalin98@gmail.com / irene.casalin2@unibo.it

Phone Number: +39 3334145522



PhD candidate in Biomedical and Neuromotor Sciences at the University of Bologna, specialized in the hematopoietic system, Myelodysplastic Syndromes (MDS), and leukemia.

Advanced expertise in molecular and cellular techniques, including DNA/RNA analysis, real-time PCR, cell-based assays, primary and immortalized cell culture management, ex vivo manipulation of patient-derived cells, protein assays, immunocytochemistry, and data analysis.

International research experience at the University of Miami, USA, focused on epigenetic mechanisms driving leukemia pathogenesis and therapy resistance, as well as CRISPR/Cas9 genome editing (knock-in and knock-out) in both in vitro and in vivo models.

Strong interest in biomedical research, with a continuous drive to expand technical knowledge and quickly learn new methodologies. Reliable, collaborative, and well-organized, with good analytical and problem-solving skills.

Education

- **PhD in Biomedical and Neuromotor Sciences** (November, 2022 – April, 2026) – University of Bologna, Italy
- **Master's Degree in Molecular and Cell Biology** (2022) – University of Bologna, Italy
Final grade: 110 cum laude/110
- **Bachelor's Degree in Biotechnology** (2020) – University of Bologna, Italy
Final grade: 110 cum laude/110
- **Scientific High School Diploma** – Liceo Scientifico “Fulcieri Paulucci di Calboli”, Forlì, Italy
Final grade: 100/100

Research Experience

- **Post-graduate trainee – IRCCS Istituto Romagnolo per lo Studio dei Tumori "Dino Amadori" - IRST Srl (January, 2026 – Present)**
Adoptive CAR T Cell Platform

- **PhD Researcher – University of Bologna, Italy (November, 2022 – Present)**

Project: Study of the cellular and molecular mechanisms regulating normal human hematopoiesis, Myelodysplastic Syndromes (MDS), and leukemic progression, with a focus on the molecular mechanisms of Azacitidine and Venetoclax in the treatment of high-risk MDS, particularly involving phosphoinositide signaling and apoptosis-related pathways (under the supervision of Prof. Matilde Y. Follo)

- Immortalized cell line handling and experimentation
- Drug treatment assays
- Isolation of mononuclear cells using Ficoll-Paque™
- DNA and RNA extraction
- Mutational analysis
- PCR and qPCR
- Flow cytometry assays (cell count, cell cycle analysis, Annexin V/PI staining, immunophenotyping)
- Western Blot
- Co-culture experiments
- Immunocytochemistry
- Data analysis

- **Visiting Research Scholar – University of Miami, USA (September, 2024 – March, 2025)**

Project: Role of PDZD2 in normal hematopoiesis (under the supervision of Dr. Maria E. Figueroa)

- Applied CRISPR/Cas9 for gene knock-in/knock-out experiments and data analysis
- Electroporation of target cells
- Primary and immortalized cell culture
- Lentivirus production and lentiviral transduction
- Colony Forming Units (CFU) Assays and data analysis
- Flow cytometry assays for immunophenotyping and data analysis using FlowJo and GraphPad
- qPCR
- Western Blot
- Hands-on experience with in vivo inducible mouse models

- **Master Thesis Internship – University of Bologna, Italy (October, 2021 – September, 2022)**

Project: Modulation of inositide-dependent signaling in leukemic cell models, with a particular focus on the role of specific point mutations in Akt3, PLCG2 and PIK3CD genes in MDS pathogenesis and therapy resistance (under the supervision of Prof. Matilde Y. Follo)

- Immortalized cell culture
- Bacterial transformation, MiniPREP, MidiPREP
- Lentiviral vectors production and lentiviral transduction
- Non-viral transfection methods (lipofection, electroporation)
- PCR, qPCR
- Western blotting
- Cytofluorimetric analysis
- ELISA immunocytochemical assays

- MTT assays
- Data analysis
- **Bachelor Thesis Internship – University of Bologna, Italy (March, 2020 – June, 2020)**
Project: Comparison between a commercial panel and one developed in the laboratory for the Next Generation Sequencing analysis of solid tumors (under the supervision of Prof. Annalisa Pession)
 - Extraction of nucleic acids, from unfixed and formalin-fixed samples
 - Mutational analysis by Next Generation Sequencing (NGS)
 - Microsatellite instability analysis (MSI)
 - Methylation analysis by MSqPCR
 - In situ methods (e.g. SISH, FISH)

Publications and Scientific Contributions

- Mongiorgi, S., De Stefano, A., Ratti, S., Indio, V., Astolfi, A., **Casalin, I.**, Pellagatti, A., Paolini, S., Parisi, S., Cavo, M., Pession, A., McCubrey, J. A., Suh, P. G., Manzoli, L., Boulwood, J., Finelli, C., Cocco, L., & Follo, M. Y. (2023). A miRNA screening identifies miR-192-5p as associated with response to azacitidine and lenalidomide therapy in myelodysplastic syndromes. *Clinical epigenetics*, 15(1), 27. <https://doi.org/10.1186/s13148-023-01441-9>
- Vidalle, M. C., Sheth, B., Fazio, A., Marvi, M. V., Leto, S., Koufi, F. D., Neri, I., **Casalin, I.**, Ramazzotti, G., Follo, M. Y., Ratti, S., Manzoli, L., Gehlot, S., Divecha, N., & Fiume, R. (2023). Nuclear Phosphoinositides as Key Determinants of Nuclear Functions. *Biomolecules*, 13(7), 1049. <https://doi.org/10.3390/biom13071049>
- **Casalin, I.**, De Stefano, A., Ceneri, E., Cappellini, A., Finelli, C., Curti, A., Paolini, S., Parisi, S., Zannoni, L., Boulwood, J., McCubrey, J. A., Suh, P. G., Ramazzotti, G., Fiume, R., Ratti, S., Manzoli, L., Cocco, L., & Follo, M. Y. (2024). Deciphering signaling pathways in hematopoietic stem cells: the molecular complexity of Myelodysplastic Syndromes (MDS) and leukemic progression. *Advances in biological regulation*, 91, 101014. <https://doi.org/10.1016/j.biore.2024.101014>
- **Casalin, I.**, Ceneri, E., Ratti, S., Manzoli, L., Cocco, L., & Follo, M. Y. (2024). Nuclear Phospholipids and Signaling: An Update of the Story. *Cells*, 13(8), 713. <https://doi.org/10.3390/cells13080713>
- Noguera-Castells, A., Campillo-Marcos, I., Dávalos, V., García-Prieto, C. A., Valcárcel, D., Molero, A., Palomo, L., Gattermann, N., Wulfert, M., Chaparro-González, L., Solé, F., Cabezón, M., Jiménez-Lorenzo, M. J., Xicoy, B., Zamora, L., De Stefano, A., **Casalin, I.**, Finelli, C., Follo, M. Y., & Esteller, M. (2024). DNA methylation profiling of myelodysplastic syndromes and clinical response to azacitidine: A multicentre retrospective study. *British journal of haematology*, 204(5), 1838–1843. <https://doi.org/10.1111/bjh.19392>

- De Stefano, A., Cappellini, A., **Casalin, I.**, Paolini, S., Parisi, S., Marvi, M. V., Fazio, A., Neri, I., Koufi, F. D., Ratti, S., Finelli, C., Curti, A., Manzoli, L., Cocco, L., & Follo, M. Y. (2024). Detection of Cancer Stem Cells in Normal and Dysplastic/Leukemic Human Blood. *Methods in molecular biology (Clifton, N.J.)*, 2777, 163–176. https://doi.org/10.1007/978-1-0716-3730-2_12
- Ceneri, E., De Stefano, A., **Casalin, I.**, Finelli, C., Curti, A., Paolini, S., Parisi, S., Ardizzoia, F., Cristiano, G., Boultood, J., McCubrey, J. A., Suh, P. G., Ramazzotti, G., Fiume, R., Ratti, S., Manzoli, L., Cocco, L., & Follo, M. Y. (2025). Signaling pathways and bone marrow microenvironment in myelodysplastic neoplasms. *Advances in biological regulation*, 95, 101071. <https://doi.org/10.1016/j.jbior.2024.101071>
- **64th ASH Annual Meeting and Exposition (10/12/2022 – 13/12/2022, New Orleans, USA)**
Poster co-author: "Venetoclax Rapidly and Strongly Enhances the Phospholipase C Response to Azacitidine Therapy in Myelodysplastic Syndromes"
- **XXXIX Congresso della Società Italiana di Iстохимика (14/06/2023 – 17/06/2023, Vulcano, Italy)**
Oral communication: "EFFECT OF VENETOCLAX AND AZACYTIDINE ON PLCs-DEPENDENT PATHWAYS IN HEMATOPOIETIC-TOLEUKEMIC STEM CELLS"
- **XXXI IACRLRD Symposium 2023 (31/08/2023 – 02/09/2023, Bologna, Italy)**
Oral communication: "AZACYTIDINE AND VENETOCLAX EFFECT ON PHOSPHOLIPASES C AND APOPTOTIC PATHWAY IN MYELODYSPLASTIC SYNDROMES (MDS)"
- **76° Congresso Nazionale SIAI (11/09/2023 – 13/09/2023, Modena, Italy)**
Oral communication: "MOLECULAR PROFILING OF PLCs AND CYTOKINE SECRETION AFTER PLCB1 MODULATION IN HEMATOPOIETIC CELLS AND BONE MARROW MICROENVIRONMENT"
- **5th SOHO ITALY ANNUAL CONFERENCE (03/10/2023 – 06/10/2023, Rome, Italy)**
Oral communication & Poster: "INVOLVEMENT OF PLCs-RELATED AND APOPTOTIC PATHWAYS IN VENETOCLAX AND AZACYTIDINE MOLECULAR RESPONSE IN MYELODYSPLASTIC SYNDROMES (MDS)"
- **50° CONGRESSO NAZIONALE SIE (23/10/2023 – 25/10/2023, Rome, Italy)**
Oral Communication: "EFFECT OF CO-ADMINISTRATION OF VENETOCLAX AND AZACYTIDINE ON PLC-RELATED AND APOPTOSIS PATHWAYS IN MYELODYSPLASTIC SYNDROMES (MDS)"
- **TOP TEN 2023 nelle Scienze Mediche, Accademia delle Scienze dell'Istituto di Bologna (07/12/2023, Bologna, Italy)**
Oral presentation: "La rivoluzione CAR: come le cellule immunitarie ingegnerizzate stanno trasformando la battaglia contro la Leucemia Mieloide Acuta"
- **XVIII CONGRESSO NAZIONALE SIES (07/03/2024 – 09/03/2024, Firenze, Italy)**
Poster presenter: "UNVEILING THE ROLE OF APOPTOTIC AND PLCs-RELATED PATHWAYS IN MYELODYSPLASTIC SYNDROMES (MDS) TREATED WITH AZACYTIDINE AND VENETOCLAX"
- **18th International Congress on Myelodysplastic Syndromes (MDS 2025) (07/05/2025 – 10/05/2025, Rotterdam, Netherlands)**

Poster presenter: "MODULATION OF SIGNALING PATHWAYS BY AZACITIDINE AND VENETOCLAX COMBINATION IN HIGH-RISK MYELODYSPLASTIC NEOPLASMS (MDS): IMPLICATIONS OF APOPTOSIS AND PHOSPHOINOSITIDE-RELATED PATHWAYS"

- **78° Congresso Nazionale SIAI (18/09/2025 – 20/09/2025, Ravenna, Italy)**

Oral presentation: "Regulation of Apoptosis and Phosphoinositide-related Pathways in Hematopoietic Cells during Azacitidine and Venetoclax Treatment"

- **52° Congresso Nazionale SIE (20/10/2025 – 22/10/2025, Milano, Italy)**

Poster presenter: "INTERACTION BETWEEN APOPTOSIS, PHOSPHOINOSITIDE-DEPENDENT PATHWAYS, AND POTENTIAL IMPLICATIONS OF A NOVEL BCL2 MUTATION IN RESPONSE TO AZACITIDINE AND VENETOCLAX IN HIGH-RISK MYELODYSPLASTIC SYNDROMES (MDS)"

Fellowships and Awards

- Merit Award for High School Diploma – Avis, Predappio (FC), Italy (2016)
- Scholarship for merit for the Degree in Biotechnology – Alma Mater Studiorum, University of Bologna (2020)
- Merit Award for the Bachelor's Degree in Biotechnology – Comune di Predappio (FC), Italy (2021)
- 3rd place at SOHO ITALY ABSTRACT AWARD 2023 – SOHO Italy (2023)
- PhD Fellowship in Biomedical and Neuromotor Sciences – University of Bologna (2022 - present)
- Marco Polo Fellowship – University of Bologna (2024)

Project title: "Exploring Epigenetic Insights and Molecular Mechanisms in MDS/AML,"
conducted at Dr. Figueroa's lab, University of Miami (USA)

Teaching and Mentoring

- Tutor of Histology for Bachelor degree in Biotechnology – University of Bologna, Italy (2024- current)
- Support for Bachelor and Master's thesis internships (2022- current)

Computational & Analytical Skills

- GraphPad Prism, FlowJo, Excel
- Basic bioinformatics skills for qPCR, Western Blot and RNA-seq data analysis

Languages

- Italian: Native
- English: C1 (spoken and written)
- French: A2

Soft Skills

- Good organizational and problem-solving skills
- Collaborative and adaptable in team settings
- Curious and proactive approach to scientific research
- Clear communication skills, both written and verbal
- Comfortable working independently and managing multiple tasks
- Eager to learn and open to new techniques and technologies
- Experience in interdisciplinary and multicultural research environments

References

References available upon request.

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Bologna, 08/09/2025

Irene Casalin

