Cesare Sala

Summary

Molecular and cellular biologist, with 10 years of proven track record on hemato-oncology and immunology. Investigation of lymphocyte processes in lymphoid malignancy development, focusing on ALL and lymphomas: Identification of novel immuno-oncological targets and mechanisms of drug resistance and relapse, antibodies and drug validation, gene expression profiling for personalized treatment strategies using in vitro and in vivo models. Four years working at the Haematology department of Cambridge University and at the BBSRC's Babraham Institute (Cambridge); collaboration with biomedical companies.

Work and Professional experience

2018 - 2025 **Research Associate at University of Florence, Dept. Experimental and Clinical Medicine.** Supervisor: Prof. A. Arcangeli anarosa.arcangeli@unifi.it

Designing and performing multiple research projects:
Collaboration with the private company GEAlab (Pistoia) for recombinant antibody production and purification.
Study of the effect of COVID-19 infection Ca^{2+} signalling in cardiomyocytes (Sala C. et al,. Cell Calcium 2025).
Excitability and metabolism during the malignant progression of Follicular Lymphoma. (Sala C. et al,. SciReports 2019).
Role of Erg1 K^{+} channel in lymphocytes development and immunity. (Sala C. et al,. Frontiers in Immunology 2023).
Analysis of the transcriptomic profile of patients with metastatic tumors. (Lastraioli E. et al,. Cancers 2021).

- Generation of cellular models (lenti-vectors) for the study of the ion channel activity of Covid-19 proteins on cardiomyocytes.
- Human induced pluripotent stem cells (**hiPS**) colture and differentiation (neuronal, muscular and cardiac phonotypes)
- Validation and characterization of antileukemic bispecific antibodies (for the Erg1-β1 integrin complex).
- Bioinformatic analysis of transcriptomic data using R programming platform.
- Immunology teaching and practical training at the University of Florence.

2016 – 2017 **Research Associate at Babraham Institute (Cambridge).** Supervisor: Dr. M. Turner

Design and management of a project for the **molecular characterization of the mechanisms of immunity: Tis11 RNA binding proteins in T cell development, thymic maturation and immune response.**

- **Flow cytometry specialist**: purification and profiling of cells by complex surface and intracellular multicolour high density flow analysis (up to 14 colours).
- Transgenic mice colony management and **analysis of cells isolated from blood and different organs**.
- **Antibody validation.**

2014 – 2016 **Research Associate at University of Cambridge,** Department of Haematology. Supervisor: Prof. M. Müschen markus.muschen@ucsf.edu

Designing and performing of a project that led to the identification of a novel role of deaminases in driving leukemic clonal evolution by introducing mutations and translocations.

- **Human and murine primary cell isolation, colture and transduction (lenti/retroviral).**
- **Validation and implementation of cellular assays**: viability, cytotoxicity, proliferation, apoptosis, cell cycle, chromosomal translocations, ELISA, Calcium signaling, phospho signalling, deamination.
- Transcriptomic profiling using RealTime-PCR and Next Generation Sequencing technologies.
- **Laboratory management, equipment maintenance and ordering**.
- **Literature review**, preparation of grants applications, presentations, meetings and posters.
- **Mentoring students** of PhD and Msc.

Academic education

2010 - 2014 **PhD in Clinical and Experimental Oncology.** Molecular Mechanisms of Oncogenesis Unit, Core Research Laboratory- Istituto Toscano Tumori (University of Florence). Supervisor: Dr. S. Conticello. s.conticello@ispro.toscana.it

Design and management of multiple research projects: Assessment of the **role of AID (Activation induced deaminase) Cytidine deamination and its splice variants in uncontrolled hypermutation**. (Sala C. et al., PLoS One 2015).

Identification of a novel role for the deaminase Apobec1 in mediating drug resistance and relapse to Imatinib treatment in ALL patients (Saraconi G. et al., Genome Biology 2014).

The assessment of the mutagenic activity of AID on the Immunoglobulin V region in relation to the cell cycle suggests an association with the mutation profile of mature B cell lymphomas.

- Molecular biology techniques including CRISPR/Cas9 technology.

2009 **State examination certificate in Biology. Qualification as Biologist.**

2006 - 2009 **Master of Science (MSc) in Molecular Biology** Department of Experimental Pathology, University of Florence (Italy). Grade: 110/110 summa cum laude. Supervisor: Prof. A. Arcangeli

Thesis: Identification of a prognostic prediction tool based on ion channels and transporters gene expression signature in follicular lymphoma for implementation in clinical studies and for a more specific and personalized treatment.

- Biopsies collection and management of databases and tissues bank;

2004 ERASMUS program at the University of Valencia (Spain).

2002 – 2006 **Bachelor of Science (BSc) in Biotechnology,** University of Florence (Depart. of Biochemistry). Grade 101/110. Supervisor: Prof. E. Meacci

Thesis: Characterization of the role of Sphingosine 1-Phosphate in myogenic differentiation.

Technical skills & competences

Cellular biology: **Retro/lentiviral transductions of human and mouse cells (overexpression vectors, shRNA, CRISPR/Cas9), Transient/stable transfections**, **human and murine primary samples and cell lines culture**, **proliferation assays, apoptosis and cell cycle assays, growth competition assay, CFU assay.** Confocal imaging, Ca^{2+} imaging

Flow citometry: Experience in using Fortesa, LSRII, ARIA III, Canto, and C6 analysers. Use of FloJo Software to analyze data.

In vivo: Transgenic animals colony management, mice handling, breeding and genotyping (Funzioni A,C,D D.M. 5/8/021; UK Home Office personal license), **isolation of cells (Blood, Spleen, Lymphonodes, Thymus and bone marrow),** IP and IV injections, in vivo imaging.

Bioinformatics: **Analysis of transcriptomic data using R programming platform, GraphPad data analysis, Alignment of sequences and detection of mutations** (Sequencher/Novoalign/SamTools), Computational biology (Galaxy platform), design of plasmids (APE), primer design and PCR simulation (AmplifX), identification of somatic mutations in cancer (COSMIC database), Statistical analysis of data (Stata), Microsoft Office.

Molecular biology: Transcriptome analysis using RealTime-PCR, cDNA Microarray and NGS technologies, ELISA**, cloning and cell transformation, site-directed mutagenesis, CRISPR/Cas9 technology**, Southern blot, deamination assays, **subcellular fractionation and purification of nuclei, cytoplasm, membranes and rafts**, transgenic mice genotyping, preparation of chemically and electro competent bacteria.

Biochemestry: Western blot, validation of antibodies, expression and purification of tagged proteins, immunofluorescence, IP and Co-IP,

Soft skills

Leadership/management: Highly motivated, reliable and organized. **Planned, led and managed multiple research projects simultaneously** achieving results to agreed deadlines; problem solving ability (experiments **trouble-shooting**). **Interpretation of data**. Recording of experimental outcomes.

Independence: Full responsibility to design lead research projects, identified and set up collaborations with new facilities; developed and implemented experimental assays new for the lab. Willing to work flexibly when needed.

Teamwork: Successful internal and external collaborations that led to publications; Networking in Cambridge, Florence, and collaborations with groups in the USA.

Teaching skills: Mentoring students of PhD and Msc

Communications: Excellent interpersonal skills with the ability to communicate with staff at all levels. Presentations at international conferences; scientific publications and PhD thesis. Willing to travel.

Languages: Mother tongue: Italian; Fluent in writing and speaking English and Spanish.

Courses and professional trainings

2021 (August) Competenze studio modelli murini. Funzioni A, C, D. D.M. 5/8/021

2017 (January and April) FACS and Sorter specialist (basic and advanced courses). Babraham Institute.

2017 (February) Introduction to R programming. Babraham Institute.

2014 (November) Mice colony management course. Cambridge University.

APPENDIX

Talks, presentations, lessons, scholarships and awards

2024 (Nov.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2024 (Sept.) **Poster** at Society of Italian pathologists, meeting in Udine, Italy.
2024 (July) **Poster** at European Society of Cardiology. EWGCCE 2024 Graz, Austria.
2023 (Nov.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2023 (Sept.) **Poster** at Society of Italian pathologists, meeting in Parma, Italy.
2023 (June) **Poster** at European Society of Cardiology. EWGCCE 2023 Copenhagen, Denmark.
2023 (Feb.) **A.D.E. Speaker** at Basic and translational oncology course, University of Florence (master of genetics University Paris 7)
2022 (Nov.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2021 (Dec) **Poster** at Society of Italian pathologists, meeting in Perugia, Italy.
2021 (Oct.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2021 (Sept) **Poster** at society of general physiologists, Woods Hole, MA, U.S.A.
2020 (Oct.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2019 (Oct.) **Academic teaching** and **FACS practical training** on Immunology, course at the University of Florence.
2019 (Sept.) **Academic teaching** about Immunology and thymic development, course at the University of Lyon-UCBL, France (Master in vaccinology).
2019 (July) **Invited speaker** at precision medicine & ion channel retreat in Vancouver, Canada.
2019 (Oct.) **Poster** at Society of Italian pathologists meeting in Firenze, Italy.
2018 (Nov.) **Invited speaker** at precision medicine & ion channel retreat in Guangzhou, China.
2018 (Oct.) **Academic teaching** and **FACS practical training** on Immunology course at the University of Florence.
2018 (Oct.) **Poster and session Chairman** at ISCaM meeting in Bratislava, Czech republic.
2018 (Sept.) **Academic teaching** about thymic development at the University of Lyon-UCBL, France (Master in vaccinology).
2016 (March) **Speaker** at UK/Germany lymphoma annual retreat in Manchester.
2012 (March) **Invited Speaker** at Symposia on Molecular and Cellular Biology in Boston, U.S.A. (Mutations, Malignancy and Memory – Antibodies and Immunity). Travel scholarship award.

Publications

- Duranti C, Iorio J, Capitani C, Lottini T, **Sala C** et al,. Antineoplastic activity of a novel tri-specific single chain antibody targeting the hERG1/β1 integrin complex and TRAIL receptors. Mol Cancer Ther, 2025 40531186
- **Sala C**, et al,. Stable expression of SARS-CoV-2 envelope viroporin promotes intracellular calcium depletion in human cells: relevance for endoplasmic reticulum stress, cell proliferation, pluripotency and lineage differentiation. Cell Calcium, 2025 40286431
- **Sala C**, et al,. Expression of the ether-a-gò-gò-related gene 1 channel during B and T lymphocyte development: role in BCR and TCR signaling. Frontiers in immunology, 2023 14 1664-3224.
- Montalbano A, **Sala C**, et al,. High throughput clone screening on overexpressed hERG1 and Kv1.3 potassium channels using ion channel reader (ICR) label free technology. Heliyon, 2023, e20112, 2405-8440.
- Gubič A, Montalbano A, **Sala C**, et al,. Immunosuppressive effects of new thiophene-based KV1.3 inhibitors. Eur J Med Chem
. 2023 Nov 5;259:115561
- Sala C, Lottini T, Lastraioli E, et al,. et al,. Transcriptomic data of Bevacizumab-adapted colorectal adenocarcinoma cells HCT-116 Data Brief. 2023 17;48:109069
- Lottini T, Iorio J, Lastraioli E, Carraresi L, Duranti C, **Sala C**, et al,. (2021) Transgenic mice overexpressing the LH receptor in the female reproductive system spontaneously develop endometrial tumour masses. Scientific Reports 2021; 11:8847
- Lastraioli E, Ruffinatti F.A, Di Costanzo F, **Sala C**, et al,. (2021) A transcriptomic approach reveals selective ribosomal remodelling in the tumour versus the stromal compartment of metastatic colorectal cancer. Cancers, 2021, 13(16), 4188
- Montalbano A, **Sala C**, Abrardo C, et al,. (2020) Data describing the effects of potassium channels modulators on outward currents measured in human lymphoma cell lines. Data Brief. 2020 21;34:106668
- **Sala C**, Arcangeli A. (2020) Reduced BCR Signaling and a Metabolic Shift Accompanies Malignant Progression of Follicular Lymphoma: A Lesson from Transcriptomics. Arch Cancer Biol Ther, 2020, 1, 31 - 36
- Pietrobono S. Anichini G, **Sala C**, et al,. (2020). ST3GAL1 is a target of the SOX2-GLI1 transcriptional complex and promotes melanoma metastasis through AXL. NATURE COMMUNICATIONS 2020; 11:5865
- Magi A*, Masselli M*, **Sala C***, Guerriero A, Laise P, Puccini B, Rigacci L, Breschi C, Crociani O, Pillozzi S, Arcangeli A. The ion channels and transporters gene expression profile indicates a shift in excitability and metabolisms during malignant progression of Follicular Lymphoma. Scientific Reports 2019; 13;9(1):8586
- **Sala C**, Mattiuz G, Pietrobono S, Chicca A, Conticello SG. (2015). Splice variants of Activation Induced Deaminase do not affect the efficency of Class Switch Recombination in murine CH12F3 cells. PLoS One 2015; 10(3):e0121719
- Saraconi G, Severi F, **Sala C**, Mattiuz G, Conticello SG (2014). The RNA editing enzyme APOBEC1 induces somatic mutations and its mutational signature appears in esophageal adenocarcinomas. Genome Biology 2014; 15(7):417

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