

06/12/2023

LORENA ZANNINO

E-mail: lorena.zannino@unipv.it



WORK EXPERIENCE

Academic years: 2021-2022; 2023-2024

Contract Professor - Master's degree course: Advanced Microscopy (in English)

University of Pavia, Pavia, Italy

Microscopy basis and principles; Optical and Electron microscopy standard techniques and innovations.

From October 2022 to August 2023

Postdoctoral researcher

University Vita e Salute S.Raffaele – UniSR

Define the cellular and molecular mechanisms governing tumor metastases growth and spread within the liver, through in vitro and vivo mouse models.

From January 2022 to October 2022

Postdoctoral researcher

Charles University, First Faculty of Medicine, Prague, Czech Republic

Scientific supervisor: Professor Dušan Cmarko

Studies on chromatin organization in the cell nucleus and its relation to genome functional output through imaging approaches. Methods for this project: nucleic acids extraction, ChIP, CLEM (DAB photoconversion), visualization of transcriptionally active chromatin sites by in vivo incorporation of uridine marked with halogens, FIB-SEM, NanoSIMS.

From October 2018 to October 2021

Ph.D. in Genetics, Molecular and Cellular Biology (20/12/2021)

Laboratory of Cell Biology and Neurobiology

Dept. of Biology and Biotechnology L.Spallanzani, University of Pavia, via Ferrata 1, 27100, Pavia, Italy

Scientific supervisor: Professor Marco Biggiogera

Ultrastructural studies on the heterochromatin organization and nucleolar activity in hepatocytes under different cell stress conditions.

Thesis title: "Cell stress and ageing affect nucleolus and heterochromatin organization in mouse hepatocytes".

Didactic activity from 2019 to 2021

Member of the examination board of the "Advanced Microscopy" course headed by Professor Marco Biggiogera (2019-2021)

Tutoring for the course "Cytology and Histology" headed by Professor Marco Biggiogera (project 5, Ateneo) - Exercises at optical microscope for the observation of histological preparations from different species of vertebrates (academic year 2019-2020)

Tutoring for the course "Comparative Anatomy" headed by Professor Vittorio Bertone (Project 9, Ateneo) - (academic year 2019-2020).

Internship. Max Planck Institute for the Biology of Ageing, Köln, Germany

Scientific supervisor: Professor Adam Antebi

Project title: "The Nucleolus as a hub in the ageing process". Methods: Immunolabelling of nucleolar proteins in muscle and epidermal cells of *C.elegans* at TEM and fluorescence microscopy in K.O. or knockdown *C.elegans* strains.

2017-2018

Molecular diagnostics of Myeloid and Lymphoblastic Leukemias

Papa Giovanni XXIII Hospital, Bergamo, Italy

Head Physician: Professor Alessandro Rambaldi

Evaluation of the course of patients' disease through the analysis of coding gene sequences as markers of tumor transformation or chemotherapeutic drug sensitivity.

Methods: Isolation of different cell blood populations from bone marrow and peripheral blood by gradient centrifugation, nucleic acids extraction and quantitation, RT-qPCR for chimeric fusion genes detection and to monitor the minimal residual disease (MRD), Genescan Analysis, Sanger and Illumina sequencing for gene variants identification.

From July 2015 to September 2016

Internship. Institute of Molecular Genetics (INGM). Policlinico Hospital, Milan.

Scientific supervisor: Professor Beatrice Bodega

The study was focused on the molecular characterization of Facioscapulohumeral Dystrophy and the epigenetic regulation of the D4Z4 repeated sequence.

Methods: CRISPR/CAS9, ChIP, Cloning, bacterial transformation, extraction of plasmids and BAC from bacteria, DNA and RNA extraction; RT-qPCR, retrovirus and lentivirus production and infection, Immunofluorescence. Cell culture maintenance: Primary and immortalized human muscle cells from biceps of FSHD patients or healthy donors. Embryonic HEK293TN cells for lentivirus and retrovirus production.

EDUCATION

From October 2018 to October 2021

Ph.D. in Genetics, Molecular and Cellular Biology (20/12/2021)

Laboratory of Cell Biology and Neurobiology

Dept. of Biology and Biotechnology L.Spallanzani, University of Pavia

From October 2013 to October 2016

University of Milano Bicocca

Master's Degree in Biology (07/10/2016)

Grade: 110/110 cum Laude

Thesis title: "Characterization of the topology and dynamic interactions of the D4Z4 macrosatellite, as a model for understanding the role of repeated sequences in the 3D genome's organization".

From October 2009 to March 2013

University of Milano Bicocca

27/03/2013 - Bachelor Degree in Biological Sciences

Thesis title: "Numb protein controls p53 tumor suppressor activity".

PUBLICATIONS

Peer reviewed journal papers

- Casali C, Galgano L, **Zannino L**, Siciliani S, Cavallo M, Mazzini G, Biggiogera M. Impact of heat and cold shock on epigenetics and chromatin structure. Eur J Cell Biol. 2023 Nov 23;103(1):151373. <https://doi.org/10.1016/j.ejcb.2023.151373>.

- **Zannino L**, Pagano A, Casali C, Oldani M, Balestrazzi A, Biggiogera M. Mercury Chloride Alters Heterochromatin Domain Organization and Nucleolar Activity in Mouse Liver. *Histochem. Cell. Biol.* 2022 Sep 22. <https://doi.org/10.1007/s00418-022-02151-8>
- **Zannino L**, Casali C, Biggiogera M. Rediscover Potassium Permanganate as a staining for basic proteins. *Histochemistry of single molecules. Methods Mol. Biol.* 2023;2566:159-171. https://doi.org/10.1007/978-1-0716-2675-7_13
- Casali C, **Zannino L**, Biggiogera M. Specific RNA Visualization at Electron Microscopy via Terbium Citrate Vapours. *Histochemistry of single molecules. Methods Mol. Biol.* 2023;2566:233-240. https://doi.org/10.1007/978-1-0716-2675-7_19
- Pagano A, **Zannino L (Co-first)**, Pagano P, Doria E, Dondi D, Macovei A, Biggiogera M, de Sousa Araujo S, Balestrazzi A. Changes in genotoxic stress response, ribogenesis and PAP (3'-phosphoadenosine 5'-phosphate) levels are associated with loss of desiccation tolerance in overprimed *Medicago truncatula* seeds. *Plant Cell & Environ. Plant Cell Environ* 2022 May;45(5):1457-1473. <https://doi.org/10.1111/pce.14295>
- Gianella M, Doria E, Dondi D, Milanese C, Gallotti L, Börner A, **Zannino L**, Macovei A, Pagano A, Guzzon F, Biggiogera M, Balestrazzi A. Exploring physiological and molecular factors involved in seed longevity: a case study of *Pisum sativum* L. accessions. *Physiologia Plantarum.* 2022 May 8;e13698. <https://doi.org/10.1111/ppl.13698>.
- Casali C, Siciliani S, **Zannino L (Co-first)**, Biggiogera M. Histochemistry for nucleic acid research: 60 years in the European Journal of Histochemistry. *Eur J Histochem.* 2022 Apr 20;66(2):3409. <https://doi.org/10.4081/ejh.2022.3409>.
- **Zannino L** and Biggiogera M. How to stain nucleic acids and proteins in Miller spreads. *Eur. J. Histochem. Eur J Histochem.* 2022 Feb 25;66(1). <https://doi.org/10.4081/ejh.2022.3364>
- **Zannino L**, Casali C, Siciliani S, Biggiogera M. The dynamics of the nuclear environment and their impact on gene function. *J. Biochem.* 2021; mvaa091. <https://doi.org/10.1093/jb/mvaa091>.
- **Zannino L**, Siciliani S, Biggiogera M. Timing of cytosine methylation on newly synthesized RNA. *Methods Mol. Biol.* 2020; 2175:197-205 https://doi.org/10.1007/978-1-0716-0763-3_14

Poster communications:

- **Zannino L**, Pagano A, Casali C, Oldani M, Balestrazzi A, Biggiogera M. Mercury Chloride Alters Heterochromatin. Mercury Chloride reshapes Heterochromatin Domains and increases Nucleolar Activity in Mouse hepatocytes. XXVII Wilhelm Bernhard Workshop on the Cell Nucleus, Prague, Czech Republic 2023
- **Zannino L**, Pagano A, Casali C, Balestrazzi A, Biggiogera M. Dexamethasone remodels some epigenetic features of heterochromatin domains and nucleolar activity in mouse liver. SIBBM, Frontiers in Molecular Biology seminar, web seminar. 7-10 June 2021.
- **Zannino L**, Bertone V, Siciliani S, Saia L, Biggiogera M. Investigating the nucleolar epigenetic code at ultrastructural level. XXVI Wilhelm Bernhard Workshop on the Cell Nucleus, Dijon, France. *Biopolym. Cell.* 2019; 35(3):243-244.

Oral communications

- **Zannino L**. The nucleolus epigenetics in a photograph. Life Science, 3rd Joint Annual Symposium of the Departments of Biology and Biotechnology, Molecular Medicine and CNR-Institute of Molecular Genetics, University of Pavia, Italy. 19-21 February 2020.

Abstracts

- Casali C, Gaiaschi L, **Zannino L**, Galgano L, Sarkar M, Mazzini G, Bottone MG, Biggiogera M. Effects of Heat and Cold Shock on Epigenetics: Insights on Methylation and Chromatin Structure. XXVII Wilhelm Bernhard Workshop on the Cell Nucleus, Prague, Czech Republic 2023

- Pagano A, **Zannino L**, Pagano P, Doria E, Dondi D, Macovei A, Biggiogera M, de Sousa Araujo S, Balestrazzi A. Nucleolar processes underlying the *Medicago truncatula* seed resilience to genotoxic injury. EMBO Workshop, Plant genome stability and change, Leiden, Netherlands. 5-8 December 2021.
- Pagano A, Pagano P, **Zannino L**, Doria E, Dondi D, Gaonkar SS, Macovei A, Biggiogera M, de Sousa Araujo S, Balestrazzi A. Exploring the stress response induced during the rehydration-dehydration cycle in primed and overprimed *Medicago truncatula* seeds. 13th ISSS (International Society for Seed Science), web Congress. 9-13 August 2021.
- Gianella M, Doria E, Dondi D, Milanese C, Gallotti L, Börner A, **Zannino L**, Macovei A, Pagano A, Guzzon F, Biggiogera M, Balestrazzi A. Exploring physiological and molecular factors involved in seed longevity: the case study of *Pisum sativum* L. 13th ISSS (International Society for Seed Science), web Congress. 9-13 August 2021.
- Casali C, **Zannino L**, Biggiogera M. The nuclear envelope: a toolbox function for splicing factors. GIC XXXIX, web conference. 14-18 June 2021.
- Pagano A, **Zannino L**, Biggiogera M, Galeotti E, Pagano P, Macovei A, de Sousa Araújo S, Balestrazzi A. How do seeds respond to post-priming desiccation? Exploring DNA damage response and mapping chromatin accessibility in *Medicago truncatula*. Plant Genomes in a Changing Environment, web workshop. 12-14 October 2020.
- Biggiogera M, Siciliani S, **Zannino L**. The Perichromatin Region: a crossroad of events. XXVI Wilhelm Bernhard Workshop on the Cell Nucleus, Dijon, France. Biopolym. Cell. 2019; 35(3):203-204.
- Siciliani S, Masiello I, **Zannino L**, Basiricò F, Casali C, King E, Lacavalla A, Saia L, Scaltritti M, Biggiogera M. High resolution study of epigenetic processes: new insights into methylation and demethylation. XXVI Wilhelm Bernhard Workshop on the Cell Nucleus, Dijon, France. Biopolym. Cell. 2019; 35(3):178-178.
- Spinelli O, Salmoiraghi S, Zanghì P, Cavagna R, Michelato A, Buklijas K, **Zannino L**, Intermesoli T, Lussana F, Delaini F, Oldani E, Caprioli C, Stefanoni P, Gianfaldoni G, Marmont F, Ferrero D, Terruzzi E, De Paoli E, Rossi G, Borlenghi E, Cavattoni I, Tajana M, Scattolin AM, Mattei D, Corradini P, Campiotti L, Ciceri F, Bernardi M, Todisco E, Cortelezzi A, Cortelazzo S, Audisio E, Bosi A, Falini B, Pavoni C, Bassan R, Rambaldi A. Molecular profile by next generation sequencing of Acute Myeloid Leukemia with normal karyotype: clinical results from the prospective trial 02/06 of the northern Italy Leukemia group (NILG). 23 rd Congress of the European Hematology Association, Stockholm, Sweden. 2018

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Milan, 06/12/2023

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