

Francesca Chiarini

Associate Professor

Dept Biomedical, Metabolic, and Neural Sciences

Morphology Section, Human Anatomy

University of Modena and Reggio Emilia

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Research activities:

My research focuses on the study of the morpho-functional organization of the nucleus and chromatin in tumor cells, with particular emphasis on the role of lamins and LINC complex proteins in bone sarcomas. I investigate nuclear envelope proteins in cellular differentiation, migration, and proliferation processes, both in tumor models and in the regenerative mechanisms of connective tissues, with a specific interest in bone tissue. A key aspect of my research concerns the study of nucleus-mediated mechanotransduction mechanisms, with the aim of understanding how mechanical forces and interactions with the extracellular matrix influence nuclear organization and the response of tumor cells.

For many years, my research activity has focused on the identification of molecules playing key roles in tumor onset and progression, with particular emphasis on the PI3K/Akt signaling pathway, a crucial axis involved in the survival and drug resistance of human tumor cells. Within this field, I continue to conduct preclinical studies aimed at identifying novel therapeutic targets and developing innovative strategies to be integrated with conventional chemotherapy, with applications in hematological malignancies and bone tumors.

In parallel with my main research activities, I investigate biomaterials for bone regeneration through in vitro and in vivo biocompatibility studies, functional assays, and post-implantation morphological and biomolecular analyses, with the aim of assessing their regenerative efficacy and degree of biological integration and contributing to the development of innovative strategies for bone integration and regeneration.

I also carry out teaching activities and contribute to the preparation and assembly of anatomical specimens for Human Anatomy teaching in Medicine and Surgery programs, as well as to the development of iconographic material used in morphological projects and research activities in gross anatomy.

For several years, I have also been involved in public engagement activities, with the aim of making research accessible to the public and highlighting its impact on society.

Peer Review Activities for Scientific Journals:

Reviewer for: Expert Opinion on Therapeutic Targets, Cellular Signaling, Journal of Cellular Physiology, Expert Opinion on Drug Discovery, Molecular Cancer Therapeutics, Translational Oncology, BBA Molecular Cell Research, EBioMedicine, Biochemistry and Cell Biology, The International Journal of Cancer, The European Journal of Cancer, The International Journal of Molecular Sciences, Cells, Oncogene, and PLOS ONE.

Research Project Review Activities:

- Reviewer for international research projects funded by the EHA (European Hematology Association).
- Member of the panel of reviewers for the evaluation of research outputs within the VQR 2011–2014, coordinated by ANVUR (Italian National Agency for the Evaluation of Universities and Research Institutes).

Education:

Jan 2007 – Dec 2009: University of Bologna, Department of Human Anatomical Sciences. PhD in Human and Molecular Morphological Sciences.

PhD thesis: Targeted therapy of the PI3K/Akt/mTOR pathway as a potential new therapeutic strategy in the treatment of T-cell acute lymphoblastic leukemia.

July 2005: University of Bologna, Department of Experimental Pathology. Degree in Biological Sciences.

Master's thesis: Malignancy of murine breast carcinoma cells transduced with the gene encoding the CCR7 chemokine receptor.

Sept 2003 – July 2005: University of Bologna, Department of Experimental Pathology. Research trainee at the Laboratory of Immunology and Metastasis Biology, Oncology Section, Department of Pathology, University of Bologna, headed by Prof. Pier-Luigi Lollini. Research focused on evaluating the efficacy of prophylactic vaccines consisting of tumor cells in transgenic mouse models for the Her-2/neu gene.

Professional Experience:

2026: National Scientific Qualification as Full Professor of Human Anatomy (SSD BIO/16).

1 Sept 2025 – present: Associate Professor of Human Anatomy (SSD BIO/16), Department of Biomedical, Metabolic and Neurosciences, Section of Human Morphology, University of Modena and Reggio Emilia.

Oct 2024: Member of the Research Committee, Department of Biomedical, Metabolic and Neurosciences, University of Modena and Reggio Emilia.

Dec 2022 – present: Member of the PhD Faculty Board of the PhD Program in *Molecular and Regenerative Medicine* (Coordinator: Prof. Rossella Manfredini).

1 Sept 2022 – 31 Aug 2025: Tenure-track Assistant Professor (RTD-B) in Human Anatomy, Department of Biomedical, Metabolic and Neurosciences, Section of Human Morphology, University of Modena and Reggio Emilia.

2021: National Scientific Qualification as Associate Professor of Human Anatomy (SSD BIO/16).

Dec 2011 – Aug 2022: Researcher, Level III, National Research Council (CNR), Institute of Molecular Genetics – Bologna Unit, hosted at IRCCS Istituto Ortopedico Rizzoli, Bologna.

Jan 2010 – Dec 2011: Senior Research Fellow, University of Bologna, Department of Human Anatomical Sciences. Research project: *Role of Intracellular Lipid Signal Transduction Pathways in the Response to Erythropoietin in Patients with Low-Risk MDS*. I was also responsible for translational studies that were part of the Phase II clinical trial

GIMEMA AML1107 (NCT00775593), in which elderly patients (>60 years) with acute myeloid leukemia were treated with combinations of clofarabine and low-dose temsirolimus. Dec 2005 – Dec 2006: Research Fellow, University of Bologna, Department of Human Anatomical Sciences. Research project: Analysis of the Constitutive Activation of the PI3K/Akt Axis in the Pathogenesis of Myeloid and Lymphoid Leukemias.

Research Project Leadership and Participation:

FAR2025DIP, University of Modena and Reggio Emilia – Principal Investigator. Ongoing project.

FAR2024DIP, University of Modena and Reggio Emilia – Principal Investigator.

FAR2023DIP, University of Modena and Reggio Emilia – Principal Investigator.

Fondazione CARISBO 2022–2025 – Principal Investigator. Project: Role of Lamin A in the Malignancy of Pediatric Bone Sarcomas and Its Modulation by Statins: A New Therapeutic Opportunity for Pediatric Tumors with Unmet Clinical Needs.

PRIN 2017, Protocol 2017RKWNJT – Local Unit Coordinator (National Coordinator: Matilde Y. Follo). Project: Epigenetic Regulation of Nuclear Inositides in Bone Marrow Microenvironment and MDS/AML Progression: New Targets, Therapy and Drugs.

AIRC Investigator Grant 2016, ID 19186, PI: Giuseppe Basso. Project: Exploiting Unique Features of Metabolic Rewiring in Wild-Type and Notch1/Pten-Mutated Patients for T-ALL Therapy. Role: External Collaborator.

FIRB – R.N. PROTEOMICA 2010, Protocol RBRN07BMCT_002, Italian Human Proteomenet – National Network for the Study of Human Proteomics. Role: Research Fellow.

PRIN 2008, Protocol 2008THTNLC_001, Coordinator: Prof. Alberto Martelli. Project: Constitutive Activation of Phosphatidylinositol 3-Kinase (PI3K)/Akt/mTOR in Acute Myeloid Leukemia: Analysis of Gene and Protein Expression Profiles and Clinical and Biomolecular Effects of Its Inhibition. Role: PhD Student.

PRIN 2005, Protocol 2005055737_001, Coordinator: Prof. Lucio Cocco. Project: Signal Transduction in the Nucleus: Interactions between Second Messengers Generated by the Inositide Cycle and Protein Kinases. Role: Research Fellow.

Awards:

2020: Cover Image, Martelli AM, Paganelli F, Chiarini F, Evangelisti C, McCubrey JA. The Unfolded Protein Response: A Novel Therapeutic Target in Acute Leukemias. *Cancers* (Basel). 2020; 12:333.

2016: Winner, Cancer Grant Program, BD Biosciences.

2016: Sponsorship from Euroclone S.p.A. to attend the 24th Biennial Congress of the European Association for Cancer Research (EACR), Manchester, UK, 9–12 July 2016.

2011: Travel Award, 53rd ASH Annual Meeting and Exposition, San Diego, CA, USA.

2009: Travel Award, 51st ASH Annual Meeting and Exposition, New Orleans, LA, USA.

Editorial Activities:

- Editorial Board Member, *International Journal of Molecular Sciences* (MDPI).
- Guest Editor, Special Issue *Molecular Research on Acute Lymphoblastic Leukemia*, *International Journal of Molecular Sciences* (IF 6.2, 2018–2019).

- Guest Editor, Special Issue *Molecular Research on Acute Lymphoblastic Leukemia 2.0*, *International Journal of Molecular Sciences*.

Membership in Scientific Societies:

FISV Federazione Italiana Scienze della Vita

SIAI Società Italiana di Anatomia ed Istologia

ABCD (Associazione di Biologia Cellulare e Differenziamento)

Italian Network of Laminopathies

EACR: European Association of Cancer Research

Teaching experiences:

I have served as course instructor for Anatomical and Pathological Foundations of Physical Activity in the Master's Degree Program in Sport and Health at the University of Modena and Reggio Emilia.

I am currently the course instructor for the module Knowledge of Anatomical and Anthropometric Bases for the Assessment of Body Composition (Introduction to Preventive and Adapted Motor Activities, AMPA) within the Master's Degree Program in Sport and Health at the University of Modena and Reggio Emilia.

I am also course instructor for Human Anatomy in the Bachelor's Degree Program in Health Assistance; Human Anatomy in the Bachelor's Degree Program in Medical Radiology, Imaging and Radiotherapy Techniques; and Basic and Movement Anatomy in the Bachelor's Degree Program in Occupational Therapy.

Student supervision:

I have extensive experience in the training and supervision of Italian and international students, including Erasmus students and PhD candidates, providing support in experimental research, research project development, and the preparation of experimental theses.

I have served as supervisor or co-supervisor of numerous experimental Bachelor's and master's theses in Medical Biotechnology, Pharmacy, Pharmaceutical Chemistry and Technology, Biological Sciences, and Sport Sciences. I have also served and continue to serve as co-supervisor of PhD students at the University of Bologna and the University of Modena and Reggio Emilia.

Public Engagement

I am actively involved in science communication and public engagement. I coordinate the project "Connessioni: dalla scoperta alla cura, il valore della ricerca per la comunità", funded through the 2026 UniMORE Public Engagement Call.

I have participated as a UNIMORE lecturer in the Uni-junior project, an educational initiative aimed at communicating and disseminating scientific knowledge to children and young people, promoted by the cultural association Leo Scienza. The initiative represents the first Italian example of a university for children and is part of the Eucu.net (European Children's Universities Network).

I coordinated science communication activities within the projects Society Next (Marie Skłodowska-Curie Actions, G.A. No. 101036092, funded by the European Commission), Linguaggio della Ricerca, funded by the Italian Ministry of University and Research (MUR) for upper and lower secondary schools, and Agenda 2030 delle bambine e dei bambini, funded by the Metropolitan City of Bologna for primary schools. I continue to carry out public engagement activities at UNIMORE within the BRAINLAB – Bambini e ricerca in laboratorio project, funded by the University.

List of Publications

My scientific activity is documented by at least 87 full-length publications in international peer-reviewed journals and 7 monographs published by international peer-reviewed publishers.

H-index: 40 (Scopus)

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The updated list of publications is available at:

<https://unimore.unifind.cineca.it/get/person/117249>

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