CURRICULUM VITAE ET STUDIORUM

Personal details

Name Sharon Russo

Place and date of birth

First Language Italian

Other Languages English (level C1)
Spanish (level A2)

Current position Research Fellow at the Institute of Genetics and Biophysics (IGB), National Research Council of Italy (CNR), Naples, Italy. (https://www.igb.cnr.it/index.php/fernando-gianfrancesco/)

Field of specialization Human molecular genetics; bone cell biology; bone disorders and tumors

Major research interest My primary scientific interest lies in understanding the molecular bases of bone tumors. In 2018, I joined Gianfrancesco's "Bone Diseases and Tumours" Laboratory at the Institute of Genetics and Biophysics (IGB) for my master's thesis. I graduated in 2019 with a thesis on the characterization of the *Zfp687* knock-in mouse model of Paget's disease of bone complicated by Giant Cell Tumor (GCT/PDB). During my PhD, I studied two different mouse models with mutations causing severe forms of PDB complicated by GCT and Osteosarcoma: the *Zfp687*^{P937R}-KI and the *Pfn1*$^{c.318\_321del}$-KI, the latter harboring a *Pfn1* loss-of-function mutation. I demonstrated that the P937R mutation triggers the onset of hepatocellular carcinoma (HCC) in mice, while mutant *Pfn1* mice exhibited nuclear atypia and multinucleation in vivo, indicative of defective cytokinesis and mitotic errors. Currently, as a junior post-doc, I am exploring the functional role of *Zfp687* and its gain- and loss-of-function mutations in bone-marrow cells, with a focus on osteoclasts and mesenchymal stem cells, given their role in the creation and maintenance of a favorable tumor microenvironment.

E-mail

Web

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Specific professional skills Molecular biology: DNA and RNA extraction, qRT-PCR, RT-PCR, molecular cloning, bacteria cells transformation, transfection.

Proteomics: Protein extraction; Western blot.

Cell culture: murine Bone-Marrow Mesenchymal Stromal cells (BM-MSCs) and Hematopoietic Stem cells (HSCs) isolation and differentiation; immortalised cell lines culture (human/mouse).

Histology: murine bone decalcification; paraffin-embedding and microtoming of murine tissues; histological stainings.

Proven and qualified skills in µCT analysis: scanner operation, scan evaluation and visualization, 3D reconstructions and data management.

Flow cytometry and FACS: detection, analysis, and sorting of mouse bone marrow-derived cell populations characterized by specific immunophenotypes;

Others: mouse dissection and tissues collection; subcutaneous and intratibial injections; cardiac-punch and retro-orbital blood collection and serum isolation; transgenic mice handling.

Education and appointments

23 May 2025 – to date — Post-doctoral Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco on the the AIRC project entitled *"Investigating the loss of Profilin 1 as a cause of aneuploidy in osteosarcoma"*. AIRC IG 25110.

03 Apr 2024 – 02 Apr 2025 — Post-doctoral Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco on the PNRR-supported AGE-IT project: "*Ageing individuals in an ageing society. Building institutional, biomedical and technological solutions for a successful Italian ageing society*".

13 December 2023 — PhD in Molecular Life Sciences at the University of Campania "Luigi Vanvitelli". Thesis entitled "*Investigating the complex role of ZNF687 in Paget's disease of bone and its impact in bone metabolism*".

01 Nov 2020 – 31 Oct 2023 — PhD student in Molecular Life Sciences at the University of Campania "Luigi Vanvitelli". Experimental activity at the Institute of Genetics and Biophysics – National Research Council of Italy, under the supervision of Dr. Fernando Gianfrancesco.

29 May 2023 – 01 Apr 2024 — Research Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco on the AIRC project entitled *"Investigating the loss of Profilin 1 as a cause of aneuploidy in osteosarcoma"*. AIRC IG 25110.

16 May 2022 –13 May 2023 Research Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco on the project entitled "*Assessing the polygenic burden of rare disruptive mutations in Parkinson's disease: a novel diagnostic test to predict Parkinson's disease risk"* Ministero della Salute RF 2019-12370224.
prot. 1853 del 17/05/2021.

28 Apr 2021 – 27 Apr 2022 Research Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco; AIRC project entitled *"Investigating the loss of Profilin 1 as a cause of aneuploidy in osteosarcoma"*. AIRC IG 25110.

11 Mar 2020 – 10 Mar 2021 Research Fellow at the Institute of Genetics and Biophysics – National Research Council of Italy, in the laboratory of Dr. Fernando Gianfrancesco on the project entitled "*Novel and minimal invasive biomarkers for Parkinson's disease: profiling of serum circulating miRNAs and patho-physiological implications".*
prot. 0000913 (10/03/2020).

Oct 2019 – Dec 2019 Consultant at M&M Biotech S.c.ar.l., Naples, Italy.

22 October 2019 Master Degree with full marks and honours in Biology (curriculum in Molecular and Cellular Biology) at the University of Naples "Federico II". Thesis in Applied Biology, entitled *"Phenotypic characterization of Zfp687 knock-in mouse model to study the giant cell tumor associated with Paget disease of bone".*

Mar 2018 – Oct 2019 Master student at the Institute of Genetics and Biophysics – National Research Council of Italy, in the "Molecular Genetics and Genomics" laboratory headed by Dr. Fernando Gianfrancesco.

17 March 2017 Bachelor's Degree in Biology (curriculum in Molecular Biology) at the University of Naples "Federico II". Thesis in Molecular Biology, *entitled "Stavudine and its degradation byproducts: genotoxic assessment by UmuC Test"*. Final grade 108/110.

Dec 2016 – March 2017 Bachelor student at the University of Naples "Federico II, under the supervision of Prof. Emilia Galdiero.

11 July 2013 High School Diploma in Classical Studies with full marks at "Marco Galdi", Cava de' Tirreni (SA).

Other Professional Qualifications

2024 Declared eligible for the selection process for a fixed-term Researcher position (RTD) at Insitute of Genetics and Biophysics

(IGB-CNR) (BANDO N. 400.2 IGB PNRR 2022 PRIN) with a score of 80/90.

Honours and Awards

2025 — Recipiente of the "Travel Bursary" awarded by the European Alliance of Associations for Rheumatology (EULAR), for the congress to be held in Barcellona, Spain, on June 11-14, 2025.

2023 — Recipient of the Registration Fee Waiver to participate as a speaker at the SIOMMMS-IFMRS International Fellow Day on 26 October 2023, Giardini-Naxos, Italy.

2023 — Recipient of the "Best Oral Presentation" awarded by the Italian Society of Osteoporosis, Mineral Metabolism and Skeletal Diseases (SIOMMMS) for the best oral communication at XXIII National Meeting. 26-28 October 2023, Giardini-Naxos, Italy.

2022 — Recipient of the "New Investigator Award" awarded by the European Calcified Tissue Society (ECTS) for one of the highest scoring abstracts submitted by new investigators at the 49th Annual Meeting, 6–10 May 2022, Helsinki, Finland.

Participation in scientific projects as collaborator of the Principal Investigator

2020-2025 — Participation in the project "Investigating the loss of Profilin 1 as the driver event for genomic instability in osteosarcoma" funded by the Italian Association for Cancer Research (AIRC).
Duration 60 months; P.I.: Fernando Gianfrancesco.

2018 — Participation in the project "Cell-based Omics approaches to dissect the molecular pathway underlying a severe form of Paget's disease of bone" funded by National Research Council of Italy.
Duration 12 months; P.I.: Fernando Gianfrancesco.

2017-2020 — Participation in the project "New experimental therapies for genetic skeletal diseases" funded by Italian Ministry of Education, Universities and Research.
Duration 36 months; P.I.: Fernando Gianfrancesco.

Research activities on animals

2021-2026 — Participation in the project "Studio dei modelli murini dei geni *Zfp687* e *Pfn1* coinvolti nell'insorgenza di tumori scheletrici e di altre patologie del metabolismo", authorization no. 125-2021-PR released by the Italian Ministry of Health.

2015-2020 Participation in the project "Studio di funzioni e regolazioni geniche riguardanti i pathways che coinvolgono il gene *Zfp687*, mediante l'uso di modelli murini" as master degree student, authorization n.551/2015-PR released by the Italian Ministry of Health.

Oral communications (selected abstracts)

2025 *"ZNF687 regulates osteoclastogenesis and drives Paget's disease of bone through myeloid lineage populations"* at the European Congress of Rheumatology (EULAR). The congress will be held in Barcelona, Spain, on June 11-14, 2025.

2024 *"Zfp687 deficiency causes altered skeletal growth due to impaired osteoclast differentiation"* at the 51st Annual Meeting of the European Calcified Tissue Society (ECTS), 25-28 May 2024, Marseille, France.

2023 *"The depletion of the Zfp687 gene, responsible for an aggressive form of Paget's disease of bone, leads to skeletal growth retardation"* at the the I edition of the SIOMMMS-IFMRS International Fellow Day, 26 October 2023, Giardini-Naxos, Italy.

2023 *"The depletion of the Zfp687 gene, responsible for an aggressive form of Paget's disease of bone, leads to skeletal growth retardation"* at the the XXIII Annual Meeting of the Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), 26-28 October 2023, Giardini-Naxos, Italy.

2023 *"Investigating the functional role of Zfp687 in Paget's disease and bone remodelling"* at the International Paget's Symposium, 19-20 April 2023, Manchester, United Kingdom.

2022 *"The ZNF687 mutation causes Paget's disease of bone dysregulating osteoclast transcriptional program and osteoblast activity"* at the XXII Annual Meeting of the Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), 13-15 October 2022, Bari, Italy.

2022 *"Zfp687 knock-in mouse model of Paget's disease of bone exhibits increased bone marrow adiposity preceding bone remodelling alteration"* at the 49th Annual Meeting of the European Calcified Tissue Society (ECTS), 6-10 May 2022, Helsinki, Finland.

2021 *"Zfp687 knock in mouse model of Paget's disease exhibits increased bone marrow adiposity preceding bone loss and osteophyte formation"* at the 4th Annual Meeting of "Skeleton" (Italian Telethon-funded researchers), 27-28 January 2021, Virtual Event.

Abstracts in National and International meetings

Scotto di Carlo F, Salatiello R, Gemble S, **Russo S**, Macé A.S, Licastro D, Basto R, Gianfrancesco F. Profilin 1 deletion drives endoreplication and polyploidy in p53-proficient cells. Chromosome Segregation and Aneuploidy EMBO Workshop, Stresa, Italy, 27-30 April 2025.

(selected as poster presentation presented by Scotto di Carlo F).

Russo S, D'Angelo M. R, Scotto di Carlo F, Gianfrancesco F. Zfp687 deficiency causes altered skeletal growth due to impaired osteoclast differentiation. European Calcified Tissue Society (ECTS), Marseille, France, 25-28 May 2024.
(selected as oral communication presented by Russo S).

Russo S, D'Angelo M. R, Scotto di Carlo F, Gianfrancesco F. Exploring the effects of genes involved in bone remodelling on skeletal aging. I edition of the AGE-IT Congress, 20- 22 May 2024, Venice, Itali.
(selected as poster presentation presented by Russo S).

Russo S, Lambiase M, D'Angelo M. R, Scotto di Carlo F, Gianfrancesco F. The depletion of the Zfp687 gene, responsible for an aggressive form of Paget's disease of bone, leads to skeletal growth retardation. I edition of the SIOMMMS-IFMRS International Fellow Day, 26 October 2023, Giardini-Naxos, Italy.
(selected as oral communication presented by Russo S).

Russo S, Lambiase M, D'Angelo M. R, Scotto di Carlo F, Gianfrancesco F. The depletion of the Zfp687 gene, responsible for an aggressive form of Paget's disease of bone, leads to skeletal growth retardation. XXIII Annual Meeting of the Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), 26-28 October 2023, Giardini-Naxos, Italy.
(selected as oral communication presented by Russo S).

Russo S, Scotto di Carlo F, Licastro D, Gianfrancesco F. Investigating the functional role of Zfp687 in Paget's disease and bone remodelling. International Paget's Symposium, Manchester, United Kingdom, 19-20 April 2023.
(selected as oral communication presented by Russo S).

Russo S, Scotto di Carlo F, Licastro D, Gianfrancesco F. The ZNF687 mutation of Paget's disease causes severe bone remodelling alterations as a result of a deregulated osteoclast transcriptional program. European Calcified Tissue Society (ECTS), Liverpool, United Kingdom, 15-18 April 2023.
(selected as poster presentation presented by Russo S).

Rossi M, Scotto di Carlo F, Silvestri D. A, Battafarano G, **Russo S**, Di Giuseppe L, Di Gregorio J, Corona M, Barra A, Pelle S, Toniolo R. M, Minisola S, Gianfrancesco F, Gallo A, Del Fattore A. Deaminase Acting on RNA-2 enzyme: a novel tumor suppressor for osteosarcoma. European Calcified Tissue Society (ECTS), Liverpool, United Kingdom, 15-18 April 2023.
(selected as poster presentation presented by the first author).

Russo S, Scotto di Carlo F, Fortunato G, Maurizi A, Teti A, Licastro D, Settembre C, Gianfrancesco F. The ZNF687 mutation causes Paget's disease of bone dysregulating osteoclast transcriptional

program and osteoblast activity. Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), Bari, Italy, 13-15 October 2022.
(selected as oral communication presented by Russo S).

Scotto di Carlo F, **Russo S**, Licastro D, Settembre C, Gianfrancesco F. PFN1 loss in bone cells reveals novel pathological mechanisms underlying Paget's disease associated with osteosarcoma. Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), Bari, Italy, 13-15 October 2022.
(selected as poster presentation).

Rossi M, Scotto di Carlo F, Silvestri D. A, Battafarano G, Di Giuseppe L, Cesarini V, **Russo S**, Di Gregorio J, Corona M, Barra A, Pezzullo M, De Stefanis C, Pelle S, Toniolo R. M, Minisola S, Gianfrancesco F, Gallo A, Del Fattore A. Role of ADAR2 editing enzyme in Osteosarcoma. Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), Bari, Italy, 13-15 October 2022.
(selected as oral communication presented by the first author).

Rossi M, Scotto di Carlo F, Silvestri D. A, Battafarano G, Di Giuseppe L, Cesarini V, **Russo S**, Di Gregorio J, Corona M, Barra A, Pezzullo M, De Stefanis C, Pelle S, Toniolo R. M, Minisola S, Gianfrancesco F, Gallo A, Del Fattore A. Overexpression of Deaminase Acting on RNA-2 enzyme ADAR2 Reduces Osteosarcoma Progression. The American Society for Bone and Mineral Research (ASBMR), Austin, TX, USA, 09-12 September 2022.

Russo S, Scotto di Carlo F, Fortunato G, Settembre C, Gianfrancesco F. Zfp687 knock-in mouse model of Paget's disease of bone exhibits increased bone marrow adiposity preceding bone remodelling alteration. European Calcified Tissue Society (ECTS), Helsinki, Finland, 6-10 May 2022.
(selected as oral communication presented by Russo S).

Scotto di Carlo F, **Russo S**, Muyas F, Mangini M, Pazzaglia L, Genesio R, Biamonte F, De Luca AC, Scotlandi K, Cortés-Ciriano I, Gianfrancesco F. The loss of Profilin 1 is a driver of chromosome instability in osteosarcoma. European Calcified Tissue Society (ECTS), Helnsinki, Finland, 07-10 May 2022.
(selected as oral communication presented by the first author).

Scotto di Carlo F, **Russo S**, Muyas F, Mangini M, Pazzaglia L, Genesio R, Biamonte F, De Luca AC, Scotlandi K, Cortés-Ciriano I, Gianfrancesco F. Profilin 1 dysfunction causes cytoskeletal defects in mitosis and undermines chromosomal stability. EMBO workshop- Chromosome segregation and aneuploidy, Wien, Austria, 01-04 May 2022.
(selected as oral communication presented by the first author).

Russo S, Scotto di Carlo F, Fortunato F, Esposito T, Settembre C, Gianfrancesco F. Zfp687 knock in mouse model of Paget's disease exhibits increased bone marrow adiposity preceding bone loss and osteophyte formation. 4th Skeleton Meeting, Virtual Event, 27-28 January 2021.
(selected as oral communication presented by Russo S).

Scotto di Carlo F, **Russo S**, Muyas F, Pazzaglia L, Esposito T, Genesio R, Nitsch L, Cortés-Ciriano I, Gianfrancesco F. Loss of function of Profilin 1 underlies mitotic defects and aneuploidy in pagetic and primary osteosarcoma. Skeleton 2021, Italy, 27-28 January 2021.
(selected as oral communication presented by the first author).

Scotto di Carlo F, **Russo S**, Muyas F, Pazzaglia L, Esposito T, Settembre C, Cortés-Ciriano I, Gianfrancesco F. Loss of function of PFN1 drives the development of pagetic and primary osteosarcoma. The American Society for Bone and Mineral Research (ASBMR), Seattle, USA, 11-14 September 2020.
(selected as oral communication presented by the first author).

Scotto di Carlo F, **Russo S**, Pazzaglia L, Esposito T, Settembre C, Gianfrancesco F. The loss of Profilin 1 is associated with early-onset Paget's disease of bone degenerating into osteosarcoma. European Calcified Tissue Society (ECTS), Marseille, France, 16-19 May 2020.
(selected as oral communication presented by the first author).

Scotto di Carlo F, **Russo S**, Fortunato G, Fico M, Vizziello E, Esposito T, Settembre C, Gianfrancesco F. Shedding light on the role of the ZNF687 transcription factor in severe Paget's disease of bone. Forum In Bone and Mineral Research, Catania, Italy, 12-13 March 2020.

Scotto di Carlo F, Divisato G, **Russo S**, Piemontese M, Parisi S, Veis DJ, Fico M, Esposito T, Russo T, Settembre C, Whyte MP, Gianfrancesco F. Investigating the functional role of the ZNF687 transcription factor in aggressive forms of Paget's disease of bone. European Calcified Tissue Society (ECTS), Budapest, Hungary, 11-14 May 2019.
(Selected as poster presentation presented by the first author).

Russo S, Divisato G, Fico M, Scotto di Carlo F, Abbes Y, Piemontese M, Parisi S, Russo T, Settembre C, Gianfrancesco G. Exploring the functional role of ZNF687 in a severe form of Paget's disease of bone. Forum In Bone and Mineral Research, Milan, Italy, 28 February – 1 March 2019.
(selected as oral communication presented by Scotto di Carlo F).

Participation in National and International meetings

- 51st Annual Meeting of the European Calcified Tissue Society (ECTS), 25-28 May 2024, Marseille, France.
- 1st AGE-IT Congress, 20-22 May 2024, Venice, Italy.
- International Paget's Symposium, 19-20 April 2023, Manchester, United Kingdom.
- 50th Annual Meeting of the European Calcified Tissue Society (ECTS), 15-18 April 2023, Liverpool, United Kingdom.
- XXII Annual Meeting of the the Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), 13-15 October 2022, Bari, Italy.
- 49th Annual Meeting of the European Calcified Tissue Society (ECTS), 6-10 May 2022, Helsinki, Finland.
- 4th Skeleton Meeting, 27-28 January 2021, Virtual Event.

- Workshop on “Zebrafish tools for the screening of therapeutic-relevant molecules affecting tissue mineralization” held on 25-27 November 2019, Faro, Portugal.
- XXIII Annual Meeting of the the Società Italiana dell’Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS), 26-28 October 2023, Giardini-Naxos, Italy.
- I edition of the SIOMMMS-IFMRS International Fellow Day , 26 October 2023, Giardini-Naxos, Italy.

Memberships in National and International Societies

- Paget’s Association
- European Calcified Tissue Society (ECTS)
- Forum in Bone and Mineral Research (FBMR)
- Società Italiana dell’Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro (SIOMMMS)

Teaching and Educational Activities

May 2022, May and June 2023, April and May 2024 — Two-day theory-practical lessons (each year) to master students of the faculty of Health Biotecnology (University of Campania "Luigi Vanvitelli") in the course "*Innovative methods and models for the study of genetic diseases*" held by Prof. Fernando Gianfrancesco, showing the analysis of a pedigree of hereditary bone diseases and cancers, how to perform PCR, Sanger sequencing method, and analysis of sequencing results; genome editing tools; how to generate and handle engineered mouse models in order to study human disorders.

Publications

3. **Russo S***, Scotto di Carlo F*, Maurizi A, Fortunato G, Teti A, Licastro D, Settembre C, Mello T, Gianfrancesco F. A mutation in the ZNF687 gene that is responsible for the severe form of Paget's disease of bone causes severely altered bone remodeling and promotes hepatocellular carcinoma onset in a knock-in mouse model. *Bone Res*. 2023.
   *equal contribution
   doi: https://www.nature.com/articles/s41413-023-00250-3
   Impact Factor (2021): 13.362

2. Scotto di Carlo F, **Russo S**, Muyas F, Mangini M, Garribba L, Pazzaglia L, Genesio R, Biamonte F, De Luca AC, Santaguida S, Scotlandi K, Cortés-Ciriano I, Gianfrancesco F. Profilin 1 deficiency drives mitotic defects and impairs genome stability. *Commun Biol*. 2023.
   doi: https://doi.org/10.1038/s42003-022-04392-8
   Impact Factor (2021): 6.548

1. **Russo S***, Scotto di Carlo F*, Gianfrancesco F. The osteoclast traces the route to bone tumors and metastases. *Front Cell Dev Biol*. 2022.
   *equal contribution
   doi: https://doi.org/10.3389/fcell.2022.886305.
   Impact Factor (2020): 6.68

Naples, 06st May 2025