

Curriculum Vitae

Silvia Buonvino



PERSONAL INFORMATION

Date of birth: 23/10/1995

Nationality: Italian **Other languages:** English

Contacts:

@: silvia.buonvino@unicamillus.org

silvia.buonvino95@gmail.com

silvia.buonvino@timpec.it

ORCID: 0009-0005-3124-3317

SCOPUS: 57215504923

EDUCATION AND TRAINING

- **2008-2014** Classical High School Diploma, Liceo Classico Gaio Valerio Catullo, with final mark 100 cum laude.
- **2014–2017** Bachelor's degree in Chemical Science and Technologies at University of Rome Tor Vergata, Rome (Italy) with final mark 110 cum laude. Experimental Thesis in Biochemistry entitled "Hyper-reactivity of cysteines in Ribonuclease A".
- **2018–2020** Master's degree in Chemical Science and Technologies at University of Rome Tor Vergata, Rome (Italy) with final mark 110 cum laude. Experimental Thesis in Biochemistry entitled "Study of H₂S slow-releasing donors effects on 3D stem cell cultures and design of cell-carrier systems".
- **2020-2023** PhD in Biochemistry and Molecular Biology cum laude, Faculty of Medicine and Surgery, University of Rome Tor Vergata, Rome (Italy). Experimental Thesis entitled "New hydrogel-based 3D cell micro-systems: optimization of valuable tools in tissue repair and cancer".
- **11/2023** State examination for the qualification in the profession of "Chemist" section A.
- **2023-2024** Research-fellowship related to the HEAL ITALIA Project - PNRR codice MUR PE00000019 (MUR- PNRR- Partenariati estesi - PE 6 - CUP: E83C22004670001) in the Lab of Biochemistry and Biomaterials for Tissue Engineering (supervisor Prof. S. Melino), Department of Experimental Medicine, Faculty of Medicine and Surgery, University of Rome Tor Vergata, Rome (Italy).
- **2024** Researcher (type A) scientific-disciplinary sector BIOS-07/A (BIO/10) Biochemistry, at UniCamillus – Saint Camillus International University of Health and Medical Sciences, Rome (Italy), for the Master's Degree courses in Medicine and Surgery, Dentistry and Dental Prosthetics, and the Bachelor's Degree in Nursing.

RESEARCH ACTIVITY

Her field of interest is in Biochemistry. In particular, her research activity has been focused on the effects of H₂S-slow releasing agents on 3D cell culture systems and on the biochemical and mechano-physical optimization of these systems based on PEG-protein hydrogels. She has investigated on both mesenchymal stem cells and breast cancer cells cultures and, recently, she has addressed her research on the production of more complex

3D co-cultures systems.

She is co-author of 9 publications (8 on peer reviewed journals and 1 chapter on Elsevier Book), first author in 7 of which, and of 1 publication under review and 1 in submission. Moreover, she is co-inventor of 1 industrial patent.

INFORMATIC AND DIGITAL SKILLS

- Office Suite (Word Processor, Spread Sheet, Presentation Software)
- Photo and video editing (Adobe Illustrator, Adobe Lightroom)
- Fortran programming language
- Programs for the interactive visualization and analysis of molecular structures and related data (UCSF Chimera, Swiss PDB Viewer)
- Graphing and data analysis application (KaleidaGraph, GraphPad Prism, ImageJ)

TECHNICAL SKILLS

Protein purification and characterization (UV-vis spectroscopy; Chromatography (Affinity, gel filtration, RP-HPLC), SDS-PAGE and Western-blotting); Recombinant Proteins Expression; pDNA extraction; Enzymatic assays; Methylene blue assay; Bacterial cultures; 2D Cell cultures; Scaffold preparation for 3D-cell cultures; 3D stem cell cultures and tumor cell cultures; Cell viability assays: trypan blue, MTT and WST-1, LIVE/DEAD assay; Cell migration assays (2D and 3D); Optical and Fluorescence Microscopy and Confocal microscopy; IR and FT-IR spectroscopy; Interpretation of $^1\text{H-NMR}$, $^{13}\text{C-NMR}$ spectra.

AWARDS

2016-2017 Winning of a grant by University of Rome Tor Vergata to students having special merit requirements.

2021 Prize “Mariano Paliotta” 2020 for the best Master Thesis in Chemistry, regarding the study of organic compounds with potential applications in the biomedical/ environmental field, University of Rome Tor Vergata.

2021 Awarded the FEBS Bursary for the 45th FEBS Congress as Poster Presenter with the abstract “H₂S donors for Photo-Polymerization Damage Protection in 3D-Stem Cell Culture Systems” in the topic category “Redox biology and oxidative stress signalling”.

RESEARCH EXPERIENCES

2017-2018 In a Lab of Biochemistry (supervisor Prof. G. Ricci), Department of Chemical Science and Technologies, University of Rome Tor Vergata, where acquired experience on kinetic studies, UV-vis spectroscopy and protein-folding.

2019-2020 In a Lab of Biochemistry and Biomaterials for Tissue Engineering (supervisor Prof. S. Melino) University of Roma Tor Vergata, where acquired experience on the preparation and characterization of 3D-stem cell culture systems using protein-hydrogels scaffolds.

2021 One month at the Prof. Dror Seliktar’s Lab of Biomaterials and Regenerative Medicine (Department of Biomedical Engineering, Technion Institute of Technology, Haifa, Israel) where acquired experience on 3D cell-culture systems and co-worked for the development of a new platform to study cell migration.

2022 Two months at the Prof. Dror Seliktar's Lab of Biomaterials and Regenerative Medicine (Department of Biomedical Engineering, Technion Institute of Technology, Haifa, Israel) where acquired experience on 3D cell-culture systems and co-worked for the development of a new platform to study cell migration.

From 2020 to present at the Biochemistry and Biomaterials for Tissue repair Lab (B&B₄T Lab) prof. S. Melino at the University of Roma Tor Vergata.

TEACHING EXPERIENCES

2019-2021 Tutoring activity by Piano Lauree Scientifiche (PLS-MIUR) for the laboratory activity "DNA Extraction for Recombinant Proteins Production" (Department of Chemical Science and Technologies, University of Rome Tor Vergata).

2021 Frontal lesson for the "Biochemistry and Laboratory" class for the master's degree course in Chemical Science and Technologies, University of Rome Tor Vergata.

2021-present Tutoring activity for "Biochemistry and Laboratory", master's degree course in Chemical Science and Technologies and "Macromolecules and biochemical processes", master's degree course in Materials Sciences and Technologies, University of Rome Tor Vergata.

2021-present Member of Examination Commission of the "Biochemistry and Laboratory" class for the master's degree course in Chemical Science and Technologies and for the "Macromolecules and biochemical processes" class for the master's degree course in Materials Sciences and Technologies, University of Rome Tor Vergata.

2022 For the Future Sight Tor Vergata 40 Event, organized by the University of Rome Tor Vergata, interventions titled: "Ricerca traslazionale e creazione di spin-off e start-up" as coordinator (<https://www.youtube.com/watch?v=VaVIZg4wO6k>); "Applicazioni "smart" nella vita di tutti i giorni della Chimica" as participant (<https://www.youtube.com/watch?v=BGcBM8UCBS8>).

2023 Open Day orientation for Materials Sciences and Technologies degree course, University of Rome Tor Vergata.

2023 2023 European Researchers' Night participation for scientific divulgation of Biomaterials research activities, Materials Sciences and Technologies degree course, Città dell'Altra Economia, Rome.

2024 Co-supervisor of a Thesis for bachelor's degree in "Applied Chemistry", University of Rome Tor Vergata.

2024 Frontal lesson for the "Biochemistry and Laboratory" class for the master's degree course in Chemical Science and Technologies, University of Rome Tor Vergata.

COMMUNICATIONS AT INTERNATIONAL CONGRESSES

2021 Poster presentation Buonvino S., Ciocci M., Seliktar D. and Melino S., "H₂S donors for Photo-Polymerization Damage Protection in 3D-Stem Cell Culture Systems", 45th FEBS Congress 2021 <https://doi.org/10.1002/2211-5463.13205>.

2021 Oral Presentation Buonvino S., "H₂S donors for Optimization of 3D Culture Systems for Stem Cell Therapy in Tissue Regeneration" at International Congress "Italy-China Joint

Symposium” (University of Rome Tor Vergata - Soochow University) organized by Springer Nature Group and CDD Press.

2022 Poster presentation Cinotti G., **Buonvino S.**, Seliktar D. and Melino S., “3D-culture system changes migration, proliferation and response to the H₂S-releasing donors treatment of breast cancer cells”, **Polymer Network Group 2022 Congress, PNG 2022**, Rome.

2022 Poster presentation Buonvino S., Labbate N., Ciocci M., Nanni F., Cacciotti I. and Melino S., “Vegetal waste-based biomaterials from *Lupinus Albus* for mesenchymal stem cell scaffold in tissue repair”, **Polymer Network Group 2022 Congress, PNG 2022**, Rome.

2022 Oral Presentation Buonvino S. and Melino S., **International 1st Mini-Symposium** on Nanomedicine at University of Rome Tor Vergata, Experimental Medicine Department.

2023 Poster presentation Buonvino S., Filippi J., Seliktar D., Martinelli E. and Melino S., “3D Cell Migration Chip a new tool toward breast cancer modelling”, **European Society for Biomaterials, ESB-2023**, Davos, Switzerland.

2024 Poster presentation Buonvino S., Fazi L., Licoccia S. and Melino S., “BPLH a waste-based biomaterial from *Lupinus albus*: sustainable scaffolds in wound healing and bone tissue repair”, **48th FEBS Congress 2024**, Milano, Italy.

2024 Poster presentation Arciero I., Buonvino S. and Melino S., “Development of 3D printable cell-array for *in vitro* modeling of breast cancer”, **48th FEBS Congress 2024**, Milano, Italy.

PUBLICATIONS

1. Di Giovanni, E., **Buonvino, S.**, Amelio, I., Melino, S. Glutathione–allylsulfur conjugates as mesenchymal stem cells stimulating agents for potential applications in tissue repair. ***International Journal of Molecular Sciences*** (2020), 21(5),1638 doi: 10.3390/ijms21051638.
2. **Buonvino, S.**, Melino, S. New Consensus pattern in Spike CoV-2: potential implications in coagulation process and cell–cell fusion. ***Cell Death Discovery*** (2020),6(1),134 doi: 10.1038/s41420-020-00372-1.
3. **Buonvino, S.**, Ciocci, M., Seliktar, D., Melino, S. Photo-polymerization damage protection by hydrogen sulfide donors for 3D-cell culture systems optimization. ***International Journal of Molecular Sciences*** (2021),22(11),6095 <https://doi.org/10.3390/ijms22116095>.
4. **Buonvino, S.**, Arciero, I., Melino, S. Thiosulfate-Cyanide Sulfurtransferase a Mitochondrial Essential Enzyme: From Cell Metabolism to the Biotechnological Applications. ***International Journal of Molecular Sciences*** (2022) Jul 30;23(15):8452 10.3390/ijms23158452.
5. **Buonvino, S.**, Ciocci, M., Nanni, F., Cacciotti, I., Melino, S. New Vegetable-Waste Biomaterials by Lupin Albus L. as Cellular Scaffolds for Applications in Biomedicine and Food. ***Biomaterials*** (2023), 293, 121984, doi:10.1016/j.biomaterials.2022.121984.

News & Views: Sealy C. Plant waste promises biocompatible bioplastics. ***Materials Today***, Volume 64, April 2023, Pages 4-5, 1369-7021/<https://doi.org/10.1016/j.mattod.2023.03.012>.

6. Nurchi, C., **Buonvino, S.**, Arciero, I., Melino, S. Sustainable Vegetable Oil-Based Biomaterials: Synthesis and Biomedical Applications. *International Journal of Molecular Sciences* (2023), 24(3), 2153; <https://doi.org/10.3390/ijms24032153>.
7. **Buonvino, S.**, Cinotti, G., Melino, S., Chapter 6, Thiosulfate sulfurtransferase: a model of essential enzyme with potential applications in medicine and biotechnology, in: Nagahara, N. (Ed.), Sulfurtransferases: Essential Enzymes for Life. Academic Press, pp. 119–144 (2023). <https://doi.org/10.1016/B978-0-443-18827-5.00006-6>.
8. **Buonvino, S.**, Arciero, I., Martinelli, E., Seliktar, D., Melino, S., Modelling the disease: H₂S-sensitivity and drug resistance of triple negative Breast cancer cells can be modulated by embedding in isotropic micro-environment, *Materials Today Bio* (2023), doi: <https://doi.org/10.1016/j.mtbio.2023.100862>.
9. **Buonvino, S.**, Di Giuseppe, D., Filippi, J., Martinelli, E., Seliktar, D., Melino, S., 3D Cell Migration Chip (3DCM-chip): a New Tool toward the Modelling of 3D Cellular Complex Systems (2024), *Adv. Healthcare Materials*, 2400040, <https://doi.org/10.1002/adhm.202400040>.
10. **Buonvino, S.**, Arciero, I., Moretti, S., Iorio, E., Melino, S. Riboflavin-phosphocholine system as light sensor of the cell and potential Achille's heel of the cancer cells, *Materials Today Bio* (2024), under review.
11. Arciero, I., **Buonvino, S.**, Melino, S. Slow H₂S-releasing Donors and 3D Printable Arrays cellular models in osteo-differentiation of Mesenchymal Stem cells for Personalized Therapies, submitted to *Biomolecules* (2024).

PATENTS

2023 Patent No 102021000025460 for industrial invention “Dispositivo lab-on-chip per studiare la migrazione cellulare in sistemi tridimensionali e relativo metodo di utilizzo” (University of Rome Tor Vergata and Technion Israel Institute of Technology, Haifa). Inventors: Melino S., Seliktar D., Martinelli E., **Buonvino S.**, Di Giuseppe D.