



Carmen-Alexandra Neculachi

PhD Student

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Professional Summary

PhD candidate with ~8 years of research experience in immunology and molecular and cellular biology, focusing on microRNA-mediated regulation of macrophage function at the intersection of hypoxia and inflammation. Integrates transcriptomic, metabolic and functional approaches to investigate mechanisms of cellular adaptation and tissue remodeling. Experienced in cell culture, animal models and advanced molecular techniques.

Education

PhD Student — School of Advanced Studies of the Romanian Academy (SCOSAAR), Bucharest, Romania (2020 – *present*)

MSc in Biochemistry and Molecular Biology — Faculty of Biology, University of Bucharest, Romania (2018 – 2020)

BSc in Biochemistry — Faculty of Biology, University of Bucharest, Romania (2015 – 2018)

Research Experience

Research Assistant — Institute of Cellular Biology and Pathology “Nicolae Simionescu” (ICBP-NS) in *Laboratory of Stem Cell Biology*, Bucharest, Romania (2018 – *present*)

Research Interests

- MicroRNA biology and gene regulation
- Hypoxia signaling
- Macrophage polarization and inflammation
- Metabolic reprogramming
- Tissue remodeling and fibrosis

Technical Skills

- Molecular biology — RNA/DNA extraction, RT-qPCR, genotyping
- Flow cytometry — cell cycle, apoptosis, phenotyping, sorting
- Metabolic assays — Seahorse XF
- Cell culture — primary cells and cell lines;

- Animal models / in vivo research
- Data analysis and graphical representation

Publications

- **Neculachi CA**, Nastase-Rusu EG, Cherry L, Marinescu-Colan CI, Tastsoglou S, Cosman BP, Popa AM, Panciuc C, Zaccagnini G, Catrina SB, Simionescu M, Martelli F, Preda MB, Burlacu A. miR-210 promotes the anti-inflammatory phenotype and M2 polarization in murine macrophages. *Frontiers in Immunology*. 2025;16:1633163. IF (2024): 5.9 (Q1).
- **Neculachi CA***, Leti LI*, Burlacu A, Preda MB. Inflammation and hypoxia negatively impact the survival and immunosuppressive properties of mesenchymal stromal cells in vitro. *Romanian Journal of Cardiology*, 2021; 31(3): 547–554. doi: 10.47803/rjc.2021.31.3.547. * *Equal contribution. BDI-indexed journal.*
- Cherry L, Popescu S, **Neculachi CA**, Nastase-Rusu EG, Marinescu-Colan CI, Cosman BP, Ciortan L, Martelli F, Simionescu M, Butoi E, Burlacu A, Preda MB. Mesenchymal stromal cells modulate neutrophil phenotype via paracrine signals. *Stem Cell Research & Therapy*. 2025. IF (2024): 7.3 (Q1).
- Preda MB, Nastase-Rusu EG, **Neculachi CA**, Zhong X, Voellenkle C, Mazure NM, Balacescu O, Ivan C, Zheng XW, Gherghiceanu M, Lebrigand K, Simionescu M, Martelli F, Mari B, Catrina SB, Burlacu A, Ivan M. miR-210 locus deletion disrupts cellular homeostasis: an integrated genetic study. *Scientific Reports*. 2025;15:22659. IF (2024): 3.9 (Q1).
- Marinescu-Colan CI, Nastase-Rusu EG, **Neculachi CA**, Martelli F, Cherry L, Preda MB, Burlacu A. From cancer to heart fibrosis – GLIPR1 highlights a subset of myofibroblasts responsive to mesenchymal stem cell therapy after myocardial infarction. *Biomedicine & Pharmacotherapy*. 2025. IF (2024): 7.5 (Q1).
- Rusu-Nastase EG, Lupan AM, Marinescu CI, **Neculachi CA**, Preda MB, Burlacu A. miR-29a increases in aging and may function as a compensatory mechanism against cardiac fibrosis through SERPINH1 downregulation. *Frontiers in Cardiovascular Medicine*. 2022. IF (2022): 3.6 (Q2).
- Preda MB, **Neculachi CA**, Fenyo IM, Vacaru AM, Publik MA, Simionescu M, Burlacu A. Short lifespan of syngeneic transplanted MSCs as a consequence of in vivo apoptosis and immune cell recruitment in mice. *Cell Death & Disease*. 2021. IF (2022): 8.469 (Q1).
- Marinescu CI, Preda MB, **Neculachi CA**, Rusu EG, Popescu S, Burlacu A. Identification of a hematopoietic cell population emerging from mouse bone marrow with proliferative potential in vitro and immunomodulatory capacity. *Frontiers in Immunology*. 2021. IF (2021): 7.561 (Q1).
- Preda MB, Lupan AM, **Neculachi CA**, Leti LI, Fenyo IM, Popescu S, Rusu EG, Marinescu CI, Simionescu M, Burlacu A. Evidence of mesenchymal stromal cell adaptation to local microenvironment following subcutaneous transplantation. *Journal of Cellular and Molecular Medicine*. 2020. IF (2020): 5.310 (Q2).

Oral Presentations

- **Neculachi CA**. miR-210 at the overlap between hypoxia signalling and inflammatory pathways in macrophage biology. Oral presentation (STSM talk), 9th COST Action CardioRNA MC and WG Meeting, University of Nicosia, Cyprus, 22–24 February 2023.

Poster Presentations

- **Neculachi CA**, Nastase-Rusu EG, Cherry L, Marinescu-Colan CI, Tastsoglou S, Cosman BP, Simionescu M, Martelli F, Preda MB, Burlacu A. MiR-210 is required for complete polarisation of M2 macrophages. CBFH Biennial Meeting – ESC Working Groups on Cellular Biology of the Heart and Myocardial Function, Naples, Italy, 26–28 November 2025.
- **Neculachi CA**, Nastase-Rusu EG, Marinescu-Colan CI, Preda MB, Burlacu A. MiR-210 deficiency enhances pro-inflammatory activation and disrupts M2 macrophage differentiation in murine models. 42nd Annual Scientific Session of the Romanian Society for Cell Biology, Bucharest, Romania, 20–21 November 2025.
- **Neculachi CA**, Nastase-Rusu EG, Zaccagnini G, Martelli F, Burlacu A, Preda MB. The role of hypoxamiR-210 on macrophage behaviour. Poster presentation, International Conference and XXXIX Scientific Session of the Romanian Society for Cell Biology, Cluj-Napoca, Romania, October 21–23, 2022.

Conferences & Scientific Events

- CBFH Biennial Meeting – ESC Working Groups on Cellular Biology of the Heart and Myocardial Function, Naples, Italy, 26–28 November 2025.
- 42nd Annual Scientific Session of the Romanian Society for Cell Biology, Bucharest, Romania, 20–21 November 2025.
- 9th COST Action CardioRNA Final MC and WG Meeting, Nicosia, Cyprus, 22–24 February 2023.
- International Conference and XXXIX Scientific Session of the Romanian Society for Cell Biology, Cluj-Napoca, Romania, 21–23 October 2022.
- ZEISS Symposium & Workshop, ICBP-NS, October 2019.
- "DIABETER" Summer School, ICBP-NS, 24 May 2019.
- Workshop "Cell Day", ICBP-NS, 17 April 2019.

Courses & Training

- 12th International Laboratory Animal Science Course (FELASA) – CULA 2026, Heraklion, Crete, April–May 2026.
- 5-Day Intensive, Hands-On Course – "Exploring Genomes and Gene Regulation Linked to Cardiovascular Phenotypes". Institute of Cellular Biology and Pathology "Nicolae Simionescu", Romanian Academy, Bucharest, October 2025. Coordinator: Dr. Mihai Bogdan Preda (ICBP-NS); co-organizers: Prof. Mircea Ivan, MD, PhD (Indiana University School of Medicine) and Acad. Maya Simionescu (Director, ICBP-NS).
- "Flow Cytometry Training School". Romanian Cytometry Association, Bucharest, 14–15 December 2020.

Project Team Member (Phd Student)

- Collaborator – Project PNRR-III-C9-2022-I8-186: "Targeting Cardiac Fibrosis in Heart Failure: Challenges and Potential Solutions Based on ncRNA Therapeutics" (FibroThera). Project director: Dr. Fabio Martelli (Scientific Director, Molecular Cardiology Laboratory, I.R.C.C.S. Policlinico San Donato, Italy). Period: 2023–2026.

- Collaborator – Project PN-III-P4-ID-PCCF-2016-0172: "Targeting Innate Immune Mechanisms to Improve Risk Stratification and to Identify Future Therapeutic Options in Myocardial Infarction" (INNATE-MI). Project director: Acad. Maya Simionescu. Period: 2020–2022.
- Collaborator – Project PN-III-P1-1.1-TE-2019-1893: "MiR-210 Genomic Locus at the Overlap Between Hypoxia Signalling and Inflammatory Networks" (210-HINT). Project director: Dr. Bogdan Preda. Period: 2021–2022.

Scholarships & Research Mobilities

- Short-Term Scientific Mission (COST CA17129, E-COST-GRANT-CA17129) — “miR-210 at the overlap between hypoxia signalling and inflammatory pathways in macrophage biology”; Molecular Cardiology Laboratory, IRCCS-Policlinico San Donato, Milan, Italy; 15.06.2022 – 31.08.2022.

Languages

- Romanian — native
- English — advanced

References

Alexandrina Burlacu, PhD — Laboratory of Stem Cell Biology, Institute of Cellular Biology and Pathology “Nicolae Simionescu”. Email: sanda.burlacu@icbp.ro