Curriculum Vitae

Giuseppe Scirocco

PERSONAL DATA

Date of birth:	September 17th,1998
Place of birth:	Termoli (CB), Italy
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Education

- 2017, Scientific high school diploma at the school II.SS. Publio Virgilio Marone - Vico del Gargano FG

- 2022, Bachelor degree in Biology (L-13) at the University of Padua (PD), Italy
  - Thesis title: “Study of phosphorylation of ATAD3B and possible implications for its ability to oligomerize”
  - Supervisor: Prof. Maria Eugenia Soriano Garcìa-Cuerva

- 2024, Master’s Degree in Medical and Molecular Biotechnology (LM-9) at University of Verona (VR), Italy
  - Thesis title: “Characterization of tumor-driven hematopoiesis deviation”
  - Supervisor: Prof. Stefano Ugel

- *On going,* Phd in Inflammation, Immunity and Cancer, Medicine department, Pathology section, at the university of Verona (VR), Italy.

Work experience and Scientific activity

1. *From January 2022 to July 2022,* I frequented the laboratory of molecular biology coordinated by Prof. Maria Eugenia Soriano Garcìa-Cuerva at the Interdepartmental Complex A.Vallisneri, University of Padua. The research investigates the ATAD3 (ATPase family AAA domain-containing protein 3) protein family, which comprises mitochondrial membrane proteins characterized by an ATPase domain. These proteins are implicated in mitochondria-related cancer mechanisms. ATAD3A plays a key role in maintaining mitochondrial structure and function. It is ubiquitously expressed across tissues and developmental stages and is essential for mitochondrial integrity. ATAD3B originates from the duplication and mutation of ATAD3A. It is expressed in embryonic and pluripotent cells but absent in differentiated adult tissues. However, it is re-expressed in certain tumors, suggesting a potential role in cancer progression and therapy resistance. Current evidence suggests that ATAD3B may act as a dominant-negative regulator of ATAD3A, thereby modulating mitochondrial function in cancer cells. During this period, we focused on verifying the potential oligomerization between ATAD3A and ATAD3B and trying to elucidate the molecular mechanisms underlying this interaction. I acquired expertise in protein purification and analytical techniques including SDS-PAGE and western blot, crosslinking and Phos-tag SDS-PAGE to assess oligomeric state and phosphorylation. I performed sample preparation, antibody-based detection and interpretation of crosslinking and Phos-tag mobility shifts. Using these techniques, we demonstrated that ATAD3A and ATAD3B do not form hetero oligomers. We also showed that the dominant-negative effect of ATAD3B on ATAD3A is independent of ATAD3B phosphorylation. Finally, I acquired a solid theoretical background in mitochondrial structure, focusing on the organization and function of the inner

mitochondrial membrane and on the proteins involved in mitochondrial maintenance and homeostasis. I studied the domain organization, cellular roles, and pathological implications of the ATAD3 family and their relevance to development and cancer.

2. *From November 2023 to June 2024,* I frequented the laboratory of immunology coordinated by prof. Vincenzo Bronte and Stefano Ugel at the Integrated University Hospital of Verona. The research is focused on characterization of tumor-driven hematopoietic deviation. We already know from literature that tumor hijacks immune cells through various mechanisms, ultimately leading to aberrant myelopoiesis. Myeloid cells differentiate from HSCs and myeloid progenitor cells in bone marrow. They belong to the innate immune system, playing a crucial role in protecting against infections, maintaining tissue homeostasis, and modulating T-cell function. Primary tumors sustain the expansion of myeloid cells, their recruitment in the tumor microenvironment (TME), and their polarization towards an immune-suppressive phenotype. We hypothesize that tumor-driven hematopoietic deviation results in distinctive alterations in progenitor cell proliferation patterns and lineage compositions. Furthermore, this change might last for an extended period even after tumor resection and eventually promote cancer progression by expanding immunosuppressive myeloid cells. We investigated the short-term and long-term tumor-driven alteration of hematopoiesis employing a syngeneic fibrosarcoma tumor model (MN-MCA1) orthotopically injected in the quadriceps of immunocompetent C57Bl/6 mice. I acquired expertise in performing functional assays to evaluate the immunosuppressive activity of myeloid-derived suppressor cells, conducted blood and tissue collection and optimized *ex vivo* sample preparation for antibody staining and multicolor flow cytometry, executed panel design, antibody titration, instrument setup and operation, data

acquisition and gating strategies, and performed flow cytometry data analysis using FlowJo software and appropriate statistical methods to ensure rigorous interpretation and reproducibility of results. Our study identified a significant modification of HSC composition in the bone marrow of tumor-bearing mice, characterized by an increased amount of myeloid-biased MPP3 (multipotent progenitor 3) compartment at the expense of the mainly lymphoid-biased MPP4 compartment. Additionally, our data revealed an increase in monocytic and granulocytic myeloid progenitors. Furthermore, these results were confirmed in peripheral tissues, where we observed an increased proportion of myeloid cells, especially monocytes and granulocytes, and a reduction of B and T lymphocytes. By transferring HSCs into lethally irradiated naïve mice, we demonstrated that tumor-exposed HSCs had peculiar engraftment and differentiation capabilities compared to naïve ones. These results 1 suggest that HSCs may retain a "memory" of the instructions provided by the tumor which could promote cancer progression and relapse. Finally, a solid theoretical background in cancer immunoediting, specifically in tumor microenvironment and cancer-related myeloid cell (MDSCs, TAMs, DCs). I also studied HSCs and their classification (MPP1, MPP2, MPP3 and MPP4) and their hierarchical organization and contribution to blood regeneration.

Laboratory Skills

- General cell culture techniques
- General molecular biology techniques, such as genomic DNA, purification, PCR-amplification
- SDS-PAGE, Protein purification and western blot, crosslinking and Phos-tag SDS-PAGE
- mRNA-based transfection
- Irradiation procedure for rodents
- *In vitro* functional assay
- Adoptive cell transfer in mice
- multi-color immuno-phenotyping and flowcytometric analysis

- Handling and use of laboratory mice. Blood collection from cheek and orbital sinus. Intraperitoneal, subcutaneous and intravenous injections. Peripheral organs perfusion. Organ extraction. Serum and organ tissue preparation
- Histochemistry, Immunohistochemistry and immunofluorescence procedures: organ cryopreservation, cutting, coloration techniques and imaging analysis.
- Extraction and purification of HSCs from bone marrow

Digital skills

- Excellent knowledge of Microsoft Office suite
- Package Adobe Acrobat DC
- Good knowledge of ImageJ software, Prism GraphPad and FlowJo for imaging and cytofluorimetric data analysis

Courses

- BLS-D for non-health professionals
- General worker training on health and safety in the workplace
- Specific training for workers employed in scientific activities in teaching, research and analysis laboratories – high risk class (2022)
- Training in the safe use of liquid nitrogen (2024)
- Basic course to perform functions A, B, C and D for mice (Mus musculus), rats (Rattus norvegicus), fish (Danio rerio) according to the Ministerial Decree of 5 August 2021
- Firefighting training - high fire risk level 3 - Legislative Decree 81/2008 (2024)

Languages

- English, Level B2 university certification, University of Padua

I hereby authorize the treatment of my personal data according to the Italian Legislative Decree no. 196 dated 30/06/2003 and to art. 13 GDPR (EU Regulation 2016/679) for the purpose of recruiting and selecting staff.