

Emanuela Marcenaro

Full Professor



EDUCATION AND TRAINING

Specialization in Clinical Pathology

"Activating receptors of human NK lymphocytes" – 50/50 cum laude

University of Genoa – Genoa, Italy

PROFESSIONAL HISTORY

2022 - present

Full Professor of Histology

University of Genoa – Genoa, Italy

Engaged in research, teaching, and third mission activities. Head of a research group at the Molecular Immunology Laboratory, focused on the field of cancer immunology, with particular emphasis on the study of Natural Killer (NK) cells and their use in innovative immunotherapies, including checkpoint inhibitor-based treatments. She coordinates competitive scientific projects and research contracts. Supervisor of PhD students and thesis advisor for doctoral and undergraduate students. Member of the Academic Board of the PhD Program in Clinical and Experimental Immunology.

She serves as Vice-President of the University Strategic Center "Security, Risk, and Vulnerability" and is a member of its Scientific-Technical Committee. She is also a member of the University Technology Transfer Commission, of the Department Executive Board, and of various academic committees for research and teaching. Departmental Representative for Third Mission activities.

2018 – 2022

Associate Professor of Histology

University of Genoa – Genoa, Italy

As Associate Professor, she carried out research, teaching, and academic coordination. She led a research group in the field of tumor immunology, particularly at the Molecular Immunology Laboratory. She coordinated scientific projects and research contracts, supervised PhD students and undergraduates, and served as thesis advisor. She was a member of the School of Medical and Pharmaceutical Sciences and of the Academic Board of the PhD Program in Clinical and Experimental Immunology. She also held roles in the Department Executive Board and served on institutional research and teaching committees.

2005 – 2018

Permanent Researcher (Assistant Professor equivalent)

University of Genoa – Genoa, Italy

During her tenure as Researcher, she led a research group working on cellular immunology and tumor immunotherapy. She supervised students and PhD candidates, coordinated research projects, and served as thesis advisor. She was a member of the Academic Board of the PhD Program in Clinical and Experimental Immunology, the Department Executive Board, and multiple academic research and teaching committees.

2005

Research Fellow

G. Gaslini Institute – Genoa – IT

Characterization of interactions between NK cells and dendritic cells in response to pathogens and tumors

2003 – 2005

Postdoctoral Research Fellow

University of Genoa – Genoa – IT

Identification of activating receptors and co-receptors involved in the natural cytotoxicity of human NK lymphocytes

2000 – 2002

FIRC (Italian Foundation for Cancer Research) Research Fellow

University of Genoa – Genoa – IT

Identification of activating receptors of human NK lymphocytes

1997 – 2002

Postgraduate Trainee in Clinical Pathology

University of Genoa – Genoa – IT

Identification of inhibitory and activating receptors on human NK cells

ACADEMIC APPOINTMENTS

11/2023 – Present

University of Genoa, Genoa, Italy

Research, Third Mission

Member of the Technology Transfer Commission of the University of Genoa

The Commission promotes and supports activities related to patents, spin-offs, and actions concerning technology transfer.

02/2022 – Present

University of Genoa, Genoa, Italy

Research, Teaching, Third Mission

Vice-President of the UNIGE Strategic Center SRV

Cooperation Network for Risk, Safety, and Vulnerability Studies

12/2021 – Present

University of Genoa, Genoa, Italy

Research, Teaching, Third Mission

Member of the Scientific-Technical Committee of the UNIGE Strategic Center SRV

Cooperation Network for Risk, Safety, and Vulnerability Studies

2020 – 10/2021

Department of Experimental Medicine (Di.Me.S.), School of Medical and Pharmaceutical Sciences, University of Genoa, Genoa, Italy

Research, Teaching, Management Activity

Member of the School of Medical and Pharmaceutical Sciences, UNIGE

Contributed to the overall management of the School

2017 – Present

Department of Experimental Medicine (Di.Me.S.), School of Medical and Pharmaceutical Sciences, University of Genoa, Genoa, Italy

Research, Teaching, Management Activity

Member of the Executive Committee of the Department of Experimental Medicine, School of Medicine, UNIGE

Contributed to the overall management of the Department

2015 – Present

University of Genoa, Genoa, Italy

Research, Teaching

Member of the Academic Board of the PhD Program in Clinical and Experimental Immunology, UNIGE

Cellular and Molecular Immunology, Oncoimmunology

2009 – Present

University of Genoa, Genoa, Italy

Research, Teaching

Member of the Founding Committee of the Postgraduate School in Orthopedics and Traumatology

2006 – Present

Innate Pharma Biotech Company, Marseille, France

Research

Scientific Collaborator/Consultant

Study of molecules that modulate NK cell function and their potential use in immunotherapies

2003 – 12/2020

Center of Excellence for Biomedical Research (CEBR) (Molecular Immunology Unit), University of Genoa, Genoa, Italy

Research

Affiliated Scientist/Member of the Executive Committee

Cellular and Molecular Immunology, Oncoimmunology

EXPERIENCE

MAIN SEMINARS

E. Marcenaro has delivered numerous seminars and lectures at both national and international levels as an invited speaker, focusing on topics related to immunology and immuno-oncology, with particular emphasis on the role of NK cells in innovative therapies.

SCIENTIFIC RESPONSIBILITY FOR RESEARCH PROJECTS ACCEPTED FOR FUNDING ON THE BASIS OF COMPETITIVE CALLS INVOLVING PEER REVIEW

- **POR-FESR Project 2021-2027.** Title: Creation of an organizational model and an integrated data screening and governance system based on aging markers and prediction of hematologic-oncologic and cardiovascular diseases development in the adult/elderly population (Scientific Coordinator of the UNIGE Unit).
- **PRIN 2022 (Code 2022YCKH7K).** Title: “Understanding the immune microenvironment of breast cancer for precision immuno-oncological therapy” (Scientific Coordinator).
- **AIRC Foundation Project for Cancer Research (AIRC IG 2021 - Id. 26037).** Title: “Understanding the role of NK cells in checkpoint inhibitor immunotherapy for the treatment of breast and gynecological cancers” (Scientific Coordinator).
- **San Paolo Foundation Project (ROL 32638-2019).** Title: “Adoptive cell immunotherapy and checkpoint inhibitors for the treatment of relapsed/refractory Hodgkin lymphoma patients: antitumor role of NK cells” (Scientific Coordinator of the UNIGE Unit).
- **Italian National Institute of Health Research Project (RF-2016-02364099)** (Scientific Coordinator of the UNIGE Unit).
- **Swiss League Against Cancer Research Project (Ref. KFS-5250-02-2021).** Title: “Immune modulation mediated by innate lymphoid cells (ILC) in ovarian carcinoma” (Collaborator).
- **AIRC Investigator Grant 2017 (n. 20312).** Title: “Checkpoint inhibitors regulate the antitumor responses of human NK cells” (Co-investigator).
- **AIRC Special Program ISM 5xmille 2018 (n. 21147).** Title: “Immunity in cancer dissemination and metastasis (ISM)” (Co-investigator).
- **Research contract funded by Innate Pharma Biotechnology Company, Marseille, France (Contract n. 719/17).** Title: “Role of NK cells in checkpoint inhibitor immunotherapy for patients with ovarian carcinoma” (Scientific Coordinator).
- **Roche Project 2017** (Marcenaro E: Scientific Coordinator, Pesce S: P.I.).
- **Carige Foundation Project (n° 2013.0275-11).** Title: “Analysis of the role of microRNAs in the differentiation of human NK cell subsets” (Scientific Coordinator).

E. Marcenaro is also the **Scientific Coordinator** of a project on monoclonal antibody production (Authorization No. 648/2020-PR) and **Principal Investigator or co-investigator** of observational, translational, and clinical protocols.

TEACHING OR RESEARCH POSITIONS (FELLOWSHIPS) AT FOREIGN UNIVERSITIES AND RESEARCH INSTITUTES

31/01/2006 - 31/12/2008

Research assignment by Innate Pharma (117 Avenue de Luminy, 13009 Marseille, France), within projects focused on studying molecules capable of activating Natural Killer (NK) cell functions and their potential use in immunotherapy.

01/04/2016 – present

Scientific responsibility for a study commissioned by Innate Pharma (117 Avenue de Luminy, 13009 Marseille, France), focused on analyzing receptors involved in regulating NK lymphocyte activity and the use of monoclonal antibodies targeting key inhibitory checkpoints (KIR, NKG2A, PD-1) for applications in cancer immunotherapy.

EDITORSHIP OR PARTICIPATION IN EDITORIAL BOARDS OF JOURNALS, PUBLISHING SERIES, ENCYCLOPAEDIAS AND TREATISES

- Member of the Editorial Board and Review Editor for the journals *Cancers* and *Frontiers in Medicine*
- Guest Associate Editor for the journals *Cancers* and *Frontiers in Immunology*
- Review Editor for the sections “Cancer Immunity and Immunotherapy” and “Gene and Cell Therapy” in *Frontiers*

PRIZES AND ACCOLADES FOR SCIENTIFIC ACTIVITY, INCLUDING MEMBERSHIP OF ACADEMIES

- 12/20/2024 **"Giambattista Vico" Award for Scientific Innovation** - Awarding Body: Cenacolo Association – For outstanding contributions to immunological research
- 11/30/2024 **"Armida Barelli" Award 2024** - Awarding Body: Cenacolo Association – For outstanding contributions to immunological research
- 06/01/2024 **Research Ambassador 2024** - Awarding Body: Cenacolo Association – For outstanding contributions to immunological research
- 09/16/2016 **Best Oral Presentation** – LXX SIAI CONGRESS, Rome, September 15-17, 2016. The presented work was judged to be of significant scientific and methodological value
- 05/01/2024 **Highly cited paper**: Witkowski M et al., *Nature* 2021. As of May 2024, this paper has received enough citations to be ranked in the top 1% of the Immunology field
- 07/19/2023 **Highly cited paper**: Pesce S et al., *JACI* 2017 (E. Marcenaro last author). 2017–present: This publication has received enough citations to be in the top 1% of Immunology (Web of Knowledge)

- **Member of the Faculty Board of Histology and Human Embryology**
- **Member of the European Academy of Tumor Immunology** (<http://www.euroacadti.eu/>)
- **Member of the Ligurian Academy of Sciences**
(<http://www.accademialigurediscienzelettere.it/>)

PARTICIPATION IN THE CREATION OF NEW BUSINESS ENTITIES (SPIN-OFFS), DEVELOPMENT, USE AND COMMERCIALISATION OF ACADEMIC PATENTS

E. Marcenaro is the holder of **international patents related to monoclonal antibodies (mAbs) targeting NKG2A**, recently employed in clinical studies (<http://worldwide.espacenet.com>):

- US Patent 60/639,465 – Granted on 12/28/2004
Title: Monoclonal antibodies against NKG2A: methods for treating immune disorders, particularly autoimmune or inflammatory disorders.
Authors: A. Moretta, E. Marcenaro
- PCT Patent IB2005/004013 – Granted on 12/27/2005
Title: Monoclonal antibodies against NKG2A.
Authors: A. Moretta, E. Marcenaro, F. Romagné, P. André
- Related patents:
 - WO2006/070286 (2006)
 - KR20070094945 (A) (2007)
 - ZA200706185 (A) (2008)
 - US 20090208416 (2009)
 - US 2011/0229486 A1 (2011)
 - EP2476705 (A1) (2012)
 - CN102977213 (A) (2013)
 - US08993319 (2015)
 - PT2476705 (E) (2016)
 - 14594353 (2018)
 - US 10/160,810 (2018)
 - US 16/226,742 (2019)

SCIENTIFIC PROFILE AND ACHIEVEMENTS

SHORT BIOGRAPHY

E. Marcenaro is Full Professor of Histology and head of a research group at the Molecular Immunology Laboratory, Department of Experimental Medicine, University of Genoa. Her scientific activity focuses on the phenotypic and functional characterization of human Natural Killer (NK) cells, key lymphocytes involved in immune surveillance against tumors. She is currently investigating the cellular and molecular mechanisms that limit NK cell activity against solid and hematological tumors, with the aim of **developing novel immunotherapeutic strategies**. In parallel, she is working on the **identification of innovative cancer screening approaches for the early diagnosis** of solid tumors (such as oral carcinomas) and

hematological malignancies (such as acute myeloid leukemia). Her research has made significant contributions to understanding the interactions between NK cells and tumor cells, paving the way for more targeted and effective immunotherapies. She has contributed to the identification and functional characterization of both HLA-specific and non-HLA-specific inhibitory receptors (see patents), as well as activating receptors and co-receptors involved in tumor cell lysis. Some of the molecules she has studied are currently being used in clinical trials or in clinical practice.

MAIN SCIENTIFIC ACHIEVEMENTS / CONTRIBUTIONS TO SCIENCE

- 1996–1999: Identification of CD94/NKG2A and IRp60 (CD300a) inhibitory receptors
- 1998–1999: Discovery of Natural Cytotoxicity Receptors (NCRs)
- 2000–2001: Characterization of 2B4 (CD244) and NTB-A (CD352) co-receptors
- 2003: Demonstration of CD59 as a receptor associated with NCRs in NK-cell activation
- 2004–2010: Study of NK receptor function/expression in HIV-infected patients
- 2004: Demonstration of homophilic recognition mediated by NTB-A
- 2005–2008: Evidence of the role of type-1/type-2 cytokines in T cell polarization mediated by NK cells
- 2005: Identification and characterization of CD56negCD16+ NK-cell subset in HIV patients
- 2007: *Demonstration of ChemR23 receptor expression and function in human NK cells*
- 2008: *Demonstration of a direct TLR2-mediated recognition of Mycobacterium bovis by NK cells*
- 2009–2014: *Description of novel mechanisms of NK-cell recruitment within the tumor microenvironment and their potential clinical applications in hematopoietic stem cell transplantation*
- 2012–2017: *Evidence of direct receptor-ligand interactions between NK cells and other innate immune effectors (neutrophils, eosinophils, macrophages)*
- 2013–2015: *Demonstration of the role of NK cells in Epstein-Barr Virus (EBV) infection*
- 2015–2017: *Identification of a novel tumor immune evasion mechanism in ovarian carcinoma mediated by sB7-H6, a ligand for Nkp30*
- 2016–2017: *Identification and characterization of a PD-1high NK-cell subset involved in suppressing NK anti-tumor activity*
- 2018: *Identification of an anergic NK-cell population (NKG2A+, CD56dim, CD16-) as a potential therapeutic target in haploidentical hematopoietic stem cell transplantation*
- 2018: *Discovery of a microRNA signature that can distinguish the two major NK cell subsets, independent of their surface phenotype*
- 2018: *Demonstration that miR-146a-5p regulates KIR expression and may enhance NK-cell alloreactivity against HLA class I+ tumor cells*
- 2019: *Identification and characterization of a subset of group 3 innate lymphoid cells (ILC3) expressing high levels of the PD-1 checkpoint*
- 2019: *Identification of biomarkers associated with CCR7-driven metastatic melanoma progression*
- 2019: *Characterization of NK cells in low-grade and high-grade peritoneal carcinomatosis*
- 2019: *Discovery of ILC-k cells: innate lymphoid cells with unique metabolic traits and KIR-independent cytotoxicity, impaired in acute myeloid leukemia*
- 2019: *Identification of a novel CD56+ ILC1-like subset with NK-like properties, functionally impaired in AML patients*
- 2019: *Identification of a $\gamma\delta$ T-cell subset ($\gamma\delta 1$ Nkp46+) with anti-tumor activity against colorectal cancer*

- 2019: *Demonstration that, under inflammatory conditions, HLA-I downregulation increases neutrophil susceptibility to NK-mediated apoptosis*
- 2020: *Identification of immune escape mechanisms in ovarian cancer patients*
- 2021: *Characterization of antiviral functions of NK cells during SARS-CoV-2 infection (COVID-19)*
- 2021: *Demonstration of the feasibility and clinical efficacy of post-transplant consolidation immunotherapy with Nivolumab in relapsed/refractory Hodgkin lymphoma*
- 2022: *Identification of NKG2A/HLA-E as an alternative immune checkpoint axis in bladder cancer*
- 2023: *Discovery of a novel cord blood NK cell subpopulation expressing functional PD-1*
- 2023–2024: *Development of a new non-invasive method for oral cancer biomarker detection using cyto-salivary sampling and a rapid, highly sensitive ELISA-based immunoassay*
- 2025: *Identification of the Androgen Receptor (AR) as a prognostic and potential therapeutic marker in endometrial cancer, correlated with key indicators of aggressiveness*
- 2025: *Identification of PD-1⁺ tissue-resident NK cells in microsatellite instability (MSI) colorectal tumors*
- 2025: *Identification of PD-1⁺ NK cell subsets in High Grade Serous Ovarian Cancer as biomarkers of disease severity and targets for combinatorial immune checkpoint therapy*

BIBLIOMETRIC INDICATORS (UPDATED JULY 2025)

E. Marcenaro is the author of **over 120 publications** in international peer-reviewed journals.

- **H-index (Scopus): 59**
- **Total citations (Scopus): 11,356**
- ORCID ID: orcid.org/0000-0003-4103-7566
- Average Impact Factor: approximately 10 (calculated on the vast majority of publications)

Since 2014, she has been listed among the **Top Italian Scientists** according to the Gruppo 2003 for Scientific Research ranking

(https://topitalianscientists.org/tis/4602/Emanuela_Marcenaro_Top_Italian_Scientist_in_Biomedical_Sciences)