

Emma Di Carlo - Curriculum Vitae

PERSONAL INFORMATION

Family name: Di Carlo, **First name:** Emma

Researcher unique identifier: ORCID, 0000-0001-7778 - 1042

EDUCATION

2003, PhD in Molecular Pathology and Tumor Morphology, “G. d’Annunzio” University, Chieti-Pescara, Italy.

1999, Medical Specialty in Pathological Histology and Anatomy, “G. d’Annunzio” University, Chieti-Pescara, Italy. Final grade: 70/70 summa cum laude.

1995, Degree in Medicine and Surgery, “G. d’Annunzio” University, Chieti, Italy. Final grade: 110/110 summa cum laude.

CURRENT POSITIONS

2019 to present, Full Professor of Pathological Anatomy, Department of Medicine and Sciences of Aging, “G. d’Annunzio” University, Chieti-Pescara, Italy.

2019 to present, Head of the Pathological Anatomy and Immuno-Oncology Unit, Center for Advanced Studies and Technology (CAST), Chieti, Italy.

2024. Coordinator of the PhD Program in Molecular Oncology and Tumor Immunology, “G. d’Annunzio” University, Chieti-Pescara, Italy.

2025. Appointed Director of the School of Specialization in Pathological Anatomy for the 2025-2028 academic period. “G. d’Annunzio” University, Chieti-Pescara, Italy.

PREVIOUS POSITIONS

2013 to present, Associate Medical Director, O.U. of Pathological Anatomy, “SS Annunziata” Hospital, Chieti, Italy.

2011, Associate Professor of Pathological Anatomy, Department of Medicine and Sciences of Aging, “G. d’Annunzio” University, Chieti-Pescara, Italy.

2010, Scientific Qualification for the position of Associate Professor of Pathological Anatomy, Faculty of Medicine and Surgery, University of Milan, Italy.

2006-2007, Consultant Patologist, Dompé Pha.r.ma S.p.a., L’Aquila, Preclinical Pharmacology, Italy.

2006, Assistant Pathologist, Operative Unit of Pathological Anatomy, “SS Annunziata” Hospital of Chieti.

2002, Researcher in Pathological Anatomy, Medicine and Surgery, “G. d’Annunzio” University, Chieti.

1999-2002, Pathologist for the Project *"Effects of Human Chorionic Gonadotropin on the Development and Metastasis of Breast Cancer"* funded by SERONO International S.A., Geneva, Switzerland.

FELLOWSHIPS AND AWARDS

2013, “**Umberto Veronesi Award**” bestowed by the Umberto Veronesi Foundation for the Progress of Sciences, for her studies on the “Microenvironment of Prostate Cancer”.

2012, “**The Best Abstract Prize**” for the study “Differential roles of SNAI2/SLUG transcription factor in the epithelial and stromal compartments of the human prostate cancer”, International Conference of Pathologic Anatomy and Cytopathology, October 25-27th, 2012, Florence, Italy.

2001, “**Travel Bursary Award**”, bestowed by the Italian Society of Immunology, XI International Conference of Immunology, July 22-27th, 2001, Stockholm, Sweden.

2001, “**Doniselli Award**” on the subject “*Early Diagnosis and Prevention of Breast Tumors*”, XI edition of the Young Researcher Competition, Soroptimist International, December 5th 2001, Varese, Italy.

2001, “**Harlan Award**” in Experimental Immunology, bestowed by the Italian Society of Immunology, June 6-9, 2001, Abano Terme, Italy.

2000-2003: Participation, as a FIRC fellow, in the *EUCIP Project - European Cancer Immunome Database*, 5th Framework Program of the European Commission Contract. (Reference QLG2-CT-1999-01211). Workpackage # 3 - Responsible: Prof. Piero Musiani, University of “G. d’Annunzio” of Chieti-Pescara. Funding for WP # 3: € 210,457.64. (Coordinator Prof. U. Sahin, University of Mainz, Germany. Total funding: euro 4,134,514.20.).

2000-2003, “**Italian Cancer Research Foundation (FIRC) Fellowship**” - *Study of the Factors Conditioning the Tumor Growth Microenvironment*.

SUPERVISION OF POSTDOCTORAL FELLOWS

2006-present. Supervisor of **Ph.D. in Oncology and Molecular Pathology; PhD in Neurosciences and Imaging**, and post-doctoral fellows, at the “G. d’Annunzio” University of Chieti.

TEACHING ACTIVITIES

2006–present. Topic: Pathological Anatomy. **Specialization Schools** in Cardiac Surgery, Neurosurgery, Rheumatology, Allergology and Clinical Immunology, Anesthesia and Intensive Care, Physical and Rehabilitative Medicine, Pathological Anatomy, Urology. "G. d'Annunzio" University of Chieti-Pescara.

2006–present. Topic: Pathological Anatomy. Degree in **Medicine and Surgery**, and in **Cardiocirculatory Physiopathology and Cardiovascular Perfusion Techniques**, "G. d'Annunzio" University of Chieti-Pescara.

2006-2012. Topic: Ultrastructural Theories and Techniques in Pathological Anatomy. **Degree Course in Biomedical Laboratory Techniques**, "G. d'Annunzio" University of Chieti-Pescara.

PROFESSIONAL POSITIONS IN ITALIAN AND FOREIGN COMPANIES AND INSTITUTIONS

Prof. Di Carlo has worked as a consultant for histopathology and immuno-molecular analysis for the following Hospitalisation and Health Care (IRCCS) and Pharmaceutical Companies

- **2006-2007:** Dompé Pharma S.p.A., L'Aquila, Preclinical Pharmacology.
- **2000-2018:** National Institute for Cancer Research (IST) of Genoa, Complex Structure of Immunological Therapy.
- **2004-2020:** "G. Gaslini" Institute of Genoa, Oncology Laboratory.
- **2003-2020:** National Institute for the Study and Treatment of Tumors of Milan, Laboratory of Immunotherapy and Gene Therapy of the Department of Experimental Oncology.
- **2015-present:** Istituto Superiore di Sanità, Rome, Experimental and Computational Carcinogenesis Department.
- **2016-2018:** Bambino Gesù Children's Hospital, Rome, Immunology Department.

CLINICAL-CARE ACTIVITY

- On 01/03/2006 he obtained, from the ASL 02 Lanciano-Vasto-Chieti, the official attribution of care assignments, at the Pathological Anatomy Section of the “SS Annunziata” Hospital of Chieti, in which he directed and coordinated a Research Group that operates in the field of Immuno-Oncology and Molecular Genetics.
- On 01/05/2013 he obtained the position of First Level Medical Director at the Operative Unit (U.O.) of Pathological Anatomy of the “SS. Annunziata” Hospital of Chieti (ASL 02 Lanciano-Vasto-Chieti, Resolution No. 550 of 23/04/2013).
- As part of the clinical-care activity carried out at the O.U. of Pathological Anatomy of the “SS. Annunziata” Hospital of Chieti, Prof. Di Carlo has particularly dedicated herself to the Histopathological and Immunohistochemical Analysis of Prostatic and Breast Neoplasms in association with their Molecular Analysis for Diagnostic and Therapeutic Purposes.
- On the basis of the Convention n3/RF-2013-02357552, signed in agreement with the Ministry of Health and the Abruzzo Region, Prof. Di Carlo started, on 03/11/2016, at the O.U. of Pathological Anatomy of the “SS Annunziata” Hospital of Chieti (PROT. N. 2132 TIT. III Cl.13 17/10/2016) a Multicenter Study concerning “Genetic and Molecular Alterations Induced by the Expression of Interleukin (IL)-27/p28 in Prostate Tissue and their Prognostic and Therapeutic Impact”.

MEMBER OF SCIENTIFIC SOCIETIES

American Association for Cancer Research (AACR)

Italian Society of Immunology, Clinical Immunology and Allergology (SIICA)

EDITORIAL ACTIVITIES- REVIEWER for the following International Scientific Journals

New England Journal of Medicine - Blood - The Journal of Pathology - The American Journal of Pathology- Molecular Oncology - American Journal of Transplantation - The Journal of Immunology - The Journal of Leukocyte Biology - The Journal of Urology - The Prostate - Cell Death and Differentiation - Cellular & Molecular Immunology - Oncogene - PLoS ONE - Mediators of Inflammation - Current Cancer Drug Targets

- Journal of Translational Medicine - BMC Cancer - Frontiers in Immunology - The European Journal of Pharmacology - Future Oncology - Precision Oncology.

REVIEWER FOR THE ITALIAN MINISTRY OF HEALTH, UNIVERSITY AND RESEARCH.

2004 - to date: *Auditor for the Ministry of Education, University and Research (MIUR):*

- **Expert Peer Reviewers for Italian Scientific Evaluation** – MIUR, Department of Higher Education and Research (PROT. N.19673 del 22.09.2015).
- **Product Auditor VQR 2011-2014.** National Agency for the Evaluation of Universities and Research Institutes (ANVUR). Appointed on 03.05.2016.
- **Project Auditor PRIN 2012.** Appointed on 07.07.2013.
- **Product Auditor VQR 2004-2010.** ANVUR. Appointed on 29.10.2012.

MAJOR COLLABORATIONS

NATIONALS:

2024-present. Collaborator: Dr. L. Rivoltini. **Topic:** Tumor Immunology. Department of Experimental Oncology, IRCCS Foundation-National Cancer Institute of Milan.

2016-present. Collaborator: Prof. G Stassi. **Topic:** Human Cancer Stem Cells. Department of Surgical, Oncological and Stomatological Sciences (DICHIRONS), University of Palermo.

2012 - present. Collaborators: Dr. P. Pichierri and Dr. M. Bignami. **Topic:** Cancer driver genes. Section of Experimental Carcinogenesis, National Institute for Public Health (ISS), Rome.

1998 - present. Collaborator: Prof. P.L. Lollini. **Topic:** Tumor Immunology. Department of Experimental, Diagnostic and Specialty Medicine (DIMES), University of Bologna.

INTERNATIONALS:

2018- present. Name of collaborator: Prof. Scott I. Abrams. **Topic:** Tumor immunology. Department of Immunology, Roswell Park Cancer Institute (RPCI), Buffalo, New York, USA.

2016 - present. Name of collaborator: Prof. Li-Fan Lu, **Topic:** Transgenic murine models of cancer. Division of Biological Sciences, Center for Microbiome Innovation and Moores Cancer Center, University of California, San Diego, California, USA.

2015 - present. Name of collaborator: Prof. Zhinan Yin. **Topic:** Transgenic murine models of cancer. The First Affiliated Hospital, Biomedical Translational Research Institute, Guangdong Province Key Laboratory of Molecular Immunology and Antibody Engineering, Jinan University, Guangzhou, China.

2014 - present. Name of collaborator: Dr V.K. Rajasekhar. **Topic:** Cancer Stem Cells. Memorial Sloan-Kettering Cancer Center, New York, USA.

2003 - 2010. Name of collaborator: Prof. F. Triebel. **Topic:** Immunology. Immutep S.A. and Faculté de Pharmacie, Chatenay-Malabry, France.

CURRENT GRANTS

Project Title: *Immunogenomics-guided precision drug targeting to fight prostate cancer metastasis.*

Funding source: AIRC - ITALIAN ASSOCIATION FOR CANCER RESEARCH, Investigator Grant - IG 2024.

Period: 01/2025-03/2030.

Role of the PI: Principal Investigator.

Project Title: *From inflammatory bowel disease to colon cancer: involvement of innate lymphocytes in early pathogenic mechanisms.*

Funding source: PNRR Project (National Recovery and Resilience Plan) - 2022

Period: 05/2023-05/2025

Role of the PI: Coordinator of Operative Unit.

Project Title: *Virus-induced Natural Killer cell triggering in atherosclerotic plaque destabilization and vascular complications.*

Funding source: ITALIAN MINISTRY OF UNIVERSITY AND RESEARCH - PROJECTS OF SIGNIFICANT NATIONAL INTEREST - 2022

Period: 06/2023-06/2025

Role of the PI: Coordinator of Operative Unit.

Project Title: *Patient-tailored Immunotherapy/Prevention of Breast Cancer Progression by CRISPR/Cas9 Editing of the Interleukin-30 Gene.*

Funding source: “Boost for Interdisciplinarity” Call 2021 - National Research Programme (PNR) 2021-2027, in line with the Framework Programme for Research and Innovation of the European Union Horizon Europe.

Period: 09/2022-09/2024.

Role of the PI: Principal Investigator.

Project Title: *Nanoparticle-mediated cytokine targeting to overcome immunosuppression and improve immunotherapy in prostate cancer.*

Funding source: AIRC - ITALIAN ASSOCIATION FOR CANCER RESEARCH, Investigator Grant - IG 2019.

Period: 01/2020-03/2025.

Role of the PI: Principal Investigator.

Project Title: *Intestinal inflammation and development of colorectal cancer: the role of innate immunity and perspectives for immunotherapeutic interventions.*

Funding source: ITALIAN MINISTRY OF UNIVERSITY AND RESEARCH - PROJECTS OF SIGNIFICANT NATIONAL INTEREST - 2017.

Period: 09/2019-03/2024.

Role of the PI: Coordinator of Operative Unit.

Project Title: *Investigating the molecular mechanism leading to genome instability in tumors: analysis of the replication stress response and its potential for early diagnosis and target therapy of cancer.*

Funding source: ITALIAN MINISTRY OF HEALTH - ORDINARY RESEARCH PROJECT, BIOMEDICAL-ORIENTED RESEARCH - 2016.

Period: 10/2018-02/2023.

Role of the PI: Coordinator of Operative Unit.

TRACK-RECORD

Prof. Di Carlo has excellent expertise in the study of the tumor microenvironment in both clinical samples and murine models of cancer. Her scientific production comprises 2 book chapters and 135 scientific articles in PubMed-cited journals.

- **H index:** 50 (www.scopus.com, 20/03/2026)
- **Citation Index Total:** 7.278 (documents from 1996).

MAIN LINES OF RESEARCH

- Identification of immunological mediators of tumor progression and their use for "*Prognostic*" and "*Therapeutic Target*" purposes in hematological malignancies, colon, prostate, and breast cancers.
- Comparative histopathological and molecular biology studies, on human and murine tissues, to investigate the "*Tumor Growth Microenvironment*" for the development of "*New Immunotherapeutic Strategies*".

MAIN SCIENTIFIC PUBLICATIONS IN THE LAST 10 YEARS (10 out of 135)

Di Carlo E.

Early Cancer Detection: What's Going on and What's Next.
MedComm, 2026; 7:e70653.

Di Carlo E.

Tumor-on-chip's alliance with molecular pathology against metastatic disease.
J Biomed Sci. 2026 Jan 6;33(1):9.

Fieni C, Sorrentino C, Ciummo SL, Fontana A, Lotti LV, Scialis S, Calvo Garcia D, Caulo M, **Di Carlo E.** Immunoliposome-based targeted delivery of the CRISPR/Cas9gRNA-IL30 complex inhibits prostate cancer and prolongs survival.
Exp Mol Med. 2024 Sep;56(9):2033-2051.

Ciummo SL, Sorrentino C, Fieni C, **Di Carlo E.** Interleukin-30 subverts prostate cancer-endothelium crosstalk by fostering angiogenesis and activating immunoregulatory and oncogenic signaling pathways.
J Exp Clin Cancer Res. 2023 Dec 12;42(1):336.

D'Antonio L, Fieni C, Ciummo SL, Vespa S, Lotti L, Sorrentino C, **Di Carlo E.** Inactivation of interleukin-30 in colon cancer stem cells via CRISPR/Cas9 genome editing inhibits their oncogenicity and improves host survival.
J Immunother Cancer. 2023 Mar;11(3):e006056.

Sorrentino C, D'Antonio L, Ciummo SL, Fieni C, Landuzzi L, Ruzzi F, Vespa S, Lanuti P, Lotti LV, Lollini PL, **Di Carlo E.** CRISPR/Cas9-mediated deletion of Interleukin-30 suppresses IGF1 and CXCL5 and boosts SOCS3 reducing prostate cancer growth and mortality.
J Hematol Oncol. 2022 Oct 13;15(1):145.

Sorrentino C, Ciummo SL, D'Antonio L, Fieni C, Lanuti P, Turdo A, Todaro M, **Di Carlo E.** Interleukin-30 feeds breast cancer stem cells via CXCL10 and IL23 autocrine loops and shapes immune contexture and host outcome.
J Immunother Cancer. 2021 Oct;9(10):e002966.

Sorrentino C, Yin Z, Ciummo S, Lanuti P, Lu LF, Marchisio M, Bellone M, **Di Carlo E.** Targeting Interleukin (IL)-30/IL-27p28 signaling in cancer stem-like cells and host environment synergistically inhibits prostate cancer growth and improves survival.
J Immunother Cancer. 2019 Jul 31;7(1):201.

Sorrentino C, Ciummo SL, Cipollone G, Caputo S, Bellone M, **Di Carlo E.** Interleukin-30/IL27p28 Shapes Prostate Cancer Stem-like Cell Behavior and Is Critical for Tumor Onset and Metastasis.
Cancer Res. 2018 May 15;78(10):2654-2668.

Airoldi I, Cocco C, Sorrentino C, Angelucci D, Di Meo S, Manzoli L, Esposito S, Ribatti D, Bertolotto M, Iezzi L, Natoli C, **Di Carlo E.** Interleukin-30 promotes breast cancer growth and progression.
Cancer Res. 2016 Nov 1;76(21):6218-6229.

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Prof. Emma Di Carlo