CURRICULUM VITAE

Rossella Tricarico, Ph.D

Current position: Assistant professor (*tenure-track*, RTDb), SC 05/I1 - SSD: Genetics (BIO/18)
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A. Personal Statement

As an Assistant professor in Genetics, my research focuses on deciphering the molecular mechanisms implicated in the onset and progression of cancer, particularly gastrointestinal cancers. My expertise lies in cancer genetics and epigenetics, with an emphasis on DNA repair system defects, epigenetic regulation, and their clinical implications. I employ a multidisciplinary approach, integrating cellular and animal models as well as omics technologies.

Throughout my PhD studies, I made significant contributions to the first Mismatch Repair (MMR) InSiGHT variant database and the comprehensive classification of MMR gene Variants of Unknown Significance (VUS). This work emphasized the critical importance of precise genetic interpretation, which is key to improving prevention strategies for individuals genetically predisposed to colorectal cancer (CRC). In my post-doctoral research, I further delved into the role of DNA repair in CRC. I discovered that the inactivation of two DNA repair proteins, *MBD4* and *TDG*, contributes to intestinal tumorigenesis in CRC-prone backgrounds, potentially leading to more severe outcomes and treatment resistance. Furthermore, I uncovered the crucial role for the epigenetic regulator TDG in melanomagenesis, resulting in two patents that address *TDG* as a novel epigenetic target for anti-cancer therapy.

More recently, as a senior research associate and then as a Marie-Curie fellow, my research has focused on the active DNA demethylation pathway, as mediated by TET proteins and TDG in colorectal cancer. I discovered that *TET1* and *TDG* play a pivotal role in modulating the immune response in colorectal cancer. I also discovered that inhibiting demethylation-triggering genes significantly increases cancer cells' susceptibility to immune cell killing, thereby suggesting a novel approach to enhance immunotherapy sensitivity in tumors. As a direct extension of my recent work in CRC, my ongoing investigations include: 1. A comprehensive characterization of *TET* genes defects in CRC through an extensive bioinformatic analysis of genomic and transcriptomic data from public databases and those available through a collaboration with the CARIS Life Science (USA). The goal is to evaluate the impact of *TET* defects on biomarkers relevant for the management and response to therapy in CRC patients. 2. Exploring the role of TET-mediated active DNA demethylation in the development and progression of solid tumors using multidisciplinary approaches including functional studies in 2D and 3D cellular models and omics analyses.

B. Education

2010 PhD in Molecular Genetics, Catholic University of the Sacred Heart, Rome, Italy
2007 Post-graduation in Medical Genetics, University of Florence, Italy (*Grade: 70/70 with honors*)
2004 Licensed to practice as a Biologist, University of Bari “Aldo Moro”, Bari, Italy (*Grade: 150/150*)
2003 Master degree in Biological Sciences, Biomolecular curriculum, University of Bari "Aldo Moro", Bari, Italy (*Grade: 110/110 with honors*)

C. Positions, Scientific Appointments, and Honors

Positions

2022-to date Assistant professor (*tenure-track*) of Genetics, Department of Biology and Biotechnology “L. Spallanzani”, Human and Cancer Genetics unit, University of Pavia, Italy
2022 Visiting scientist, Institute for Diabetes and Cancer (HDC)-Helmholtz Zentrum München (HMGU), Munich, Germany, laboratory of Prof. Natalia S. Pellegata
2020-2022 Marie Skłodowska-Curie postdoctoral fellow, Department of Biology and Biotechnology “L. Spallanzani”, Human and Cancer Genetics unit, University of Pavia, Italy, laboratory of Prof. Guglielmina N. Ranzani
2018-2020 Visiting scientist, Molecular Therapeutics Program, Fox Chase Cancer Center, Philadelphia, USA, laboratory of Prof. Erica Golemis
2015-2018 Research Associate, Cancer Epigenetics Program, Fox Chase Cancer Center, Philadelphia, USA, laboratory of Prof. Alfonso Bellacosa
2012-2015 Postdoctoral Associate, Cancer Epigenetics Program, Fox Chase Cancer Center, Philadelphia, USA, laboratory of Prof. Alfonso Bellacosa

2011-2012 Short-term postdoctoral position to finish publication from thesis project at the University of Florence, Department of Clinical Pathophysiology Medical Genetics Unit, Italy, laboratory of Prof. Maurizio Genuardi

2009 Visiting fellow at International Agency for Research on Cancer (IARC), Genetic Cancer Susceptibility Group, Lyon, France, laboratory of Prof. Sean V. Tavtigian

2007-2010 PhD student at Catholic University of Rome, joint program with the University of Florence - Department of Clinical Pathophysiology - Medical Genetics Unit, Italy, laboratory of Prof. Maurizio Genuardi

2004-2007 Training fellow in post-graduation School in Medical Genetics at University of Florence, Department of Clinical Pathophysiology Medical Genetics Unit, Italy, laboratory of Prof. Maurizio Genuardi

2004 Research fellow at University of Bari "Aldo Moro", Department of Pathology and Genetics, Section of Genetics, Bari, Italy, laboratory of Prof. Mariano Rocchi

Academic service:

2024 Faculty member of the proposing committee for the PhD program in Genetics, Molecular and Cellular Biology at the University of Pavia, Italy

2023-to date Faculty member of the examination committee for the award of 5 research fellowships (*assegni di ricerca*) in the scientific-disciplinary sector BIO/18 (Genetics) at the University of Pavia and the University of Bari "Aldo Moro", Italy.

2023 Scientific host for the Visiting Professor Dr. Lynnette Fernandez-Cuesta, team leader of the Rare Cancer Genomics (RCG) team, International Agency for Research on Cancer, Lyon, France.

2023 Faculty member of the PhD defense committee in the scientific-disciplinary sector BIO/18 (Genetics) at the University of Bari "Aldo Moro", Italy.

2023 Organizer of the Italian Society of Human Genetics (SIGU) webinar entitled “Spatial chromatin mapping and proteomics techniques: applications for studying epigenetic alterations in pathological conditions”.

2022-to date Faculty member of the thesis committee for the Master’s degree in Experimental and Applied Biology and Bachelor in Biological Sciences at University of Pavia, Italy.

2022-to date Faculty member of the Department Council of Biology and Biotechnology, University of Pavia, Italy.

2022-to date Faculty member of the Teaching Council of Biological Sciences, University of Pavia, Italy.

2021-to date Member of the Working Group for the creation of a Joint Master’s degree in Cancer Biology led by the University of Pavia in collaboration with the University of Montpellier (France), the Institute for Research in Immunology and Cancer (IRIC) at the University of Montreal (Canada) (European Erasmus+ project "MAD4CANCER": ERASMUS-EDU-2021-EMJM-DESIGN, Grant agreement no. 101050479)

2021-to date Member of Italian Society of Human Genetics (SIGU) Epigenetics Working Group

2017-2018 Member of the Inflammation Working Group at Fox Chase Cancer Center, Philadelphia, USA

2015-2017 Member of the committee for the Postdoctoral Distinguished Lecturer Series at Fox Chase Cancer Center, Philadelphia, USA

2015 Member of the committee for the organization of the 20th Annual Graduate Student and Postdoctoral Fellow Research Symposium at Fox Chase Cancer Center, Philadelphia, USA

2014-2016 Member of the study section of the Immersion Science High School program at Fox Chase Cancer Center, Philadelphia, USA

2012-2014 Member of the Genome Stability Working Group at Fox Chase Cancer Center, Philadelphia, USA

2007-2010 Member of the thesis committee for the Master’s degree in Biological Sciences and Medical Biotechnologies at University of Florence, Italy

2005-to date Supervisor of internship activities (co-supervisor) and thesis advisor for bachelor's and/or master's degrees (n=8) in Biological Sciences, Experimental and Applied Biology and Biotechnologies at the Universities of Florence (until 2012) and Pavia (2020 to date).

Honors and awards

2022 1st Cancer Epigenetics Institute Annual Symposium award for the best poster, Philadelphia, USA

2021 National scientific qualification as associate professor of Genetics (scientific-disciplinary sector BIO/18)

2020 National scientific qualification as associate professor of Medical Genetics (scientific-disciplinary sector MED/03)
2020 Subject expert in Human Molecular Genetics, Molecular Biology and Genetics
2018 Fels Trainee Day award – Temple University School of Medicine, Philadelphia, USA
2018 Fox Chase Cancer Center Travel Award, USA
2016 4th Annual Temple University School of Medicine Translational Symposium Award for outstanding achievement in research, USA
2015 SIGU (Italian Society of Human Genetics) award for the best talk in Cancer Genetics, Italy
2015 Fox Chase Cancer Center Travel Awards, USA
2014 Fox Chase Cancer Center Travel Awards, USA
2005 SIGU (Italian Society of Human Genetics) award for the best poster, Italy

Other Experience, Professional Memberships

Peer reviewer for scientific journals: Cancers, Cancer Genetics, Gene, Cancer Biology and Therapy, Frontiers in Oncology, Molecular Therapy-Nucleic Acids

*Memberships***:** American Association for Cancer Research (AACR), Italian Society of Human Genetics (SIGU), Italian Society of Geneticists (AGI), European Society of Human Genetics (ESHG), Italian Association for the Study of Familial and Hereditary Tumors (AIFET, former AIFEG)

Teaching experience:

2022-to date Lecturer for the course in Pharmacogenomics, Cancer Genomics and Epigenomics (6 CFU/ECTS credits) in the Master's degree program in Molecular Biology and Genetics, curriculum in Molecular and Digital Biology, University of Pavia, Italy
2022-to date Lecturer for the course in Basic Genetics and Cell Biology (6 CFU/ECTS credits) in the Master's degree program in Molecular Biology and Genetics, curriculum in Molecular and Digital Biology, University of Pavia, Italy
2022-2023 Lecturer for a teaching module (2 CFU/ECTS credits) in the course "Human and Molecular Genetics" in the Master's degree program in Experimental and Applied Biology, University of Pavia, Italy
2005-2007 Lecturer for the course in Informatics applications and Genomics in the bachelor's in biotechnology, University of Florence, Italy

Fellowships:

2022-2022 Marie Skłodowska-Curie Individual postdoctoral fellowship (MSCA-IF-2019-Grant agreement no. 896865 - TETCOLON)
2015-2018 Postdoctoral fellowship endowed by the William J. Avery Foundation in Cancer Biology, USA
2011-2012 Research fellowship (*assegno di ricerca*) endowed based on scientific qualifications and interview by the University of Florence, Italy
2005-2007 Research fellowships (*assegni di ricerca*) endowed based on scientific qualifications and interview by the University of Florence, Italy
2004-2005 Research fellowship endowed by the Istituto Giuseppe Toniolo di Studi Superiori, Italy

Completed and ongoing funded projects:

2023-2025 PRIN 2022-PNRR - ERC LS4 (Italian Ministry of University and Research, GRANT_NUMBER P20223Y5AX_003). *Title: "CO-taRgeting REspiratory Complex I and the epigenetic regulator TET2: a novel anticancer strategy (CORRECT)": Role: PI of the local unit*
2020-2022 Marie Skłodowska-Curie Individual Fellowship (Horizon 2020 Framework Programme-European Union, IT GRANT_NUMBER: 896865). *Title: Dissecting the role of the epigenetic regulator TET2 in colorectal cancer (TETCOLON)"*, Role: PI
2015-2017 Fox Chase Cancer Center pilot grant. *Title: Hereditary colorectal cancer gene discovery via exome sequencing of high-risk families* (PIs Bellacosa A, Hall M), Role: collaborator
2015-2018 William J. Avery Foundation postdoctoral fellowship. *Title: Role of TDG-mediated active DNA demethylation in cancer,* Role: PI

D. Contributions to science

Scientific communications

Selected abstract for oral presentation at national and international conferences (17): IV AIFEG (Italian Association for the Study of Familial and Hereditary Gastrointestinal tumors) conference, *2005* (Pavia, Italy); IV AIFEG conference, *2006*, (Padua, Italy); VIII AIFEG conference, 2009 (Rome, Italy); XVIII SIGU (Human Society of Genetics) conference, *2015* (Rimini, Italy); 49th ESHG (European Society of Human Genetics) Conference, *2016*, (Barcellona, Spain); 21st Annual Research Day Fox Chase Cancer Center, *2016*, (Philadelphia, USA); 4th

Annual Temple University School of Medicine Translational Symposium, *2016*, (Philadelphia, USA); Fels Trainee Day-Temple University School of Medicine, *2018*, (Philadelphia, USA); 51st ESHG Conference, *2018*, (Milan, Italy); XXIV SIGU conference, virtual edition, *2021*; 56th ESHG Conference, *2023*, (Glasgow, Scotland)
Invited speaker (3): Webinar on DNA methylation in human disease organized by SIGU, *2020*; MAD4CANCER scientific meeting, *2023* (Montpellier, France); Second-level Master's in "Clinical Cytogenomics and Cytogenetics Laboratory", *2024* University of Bari "Aldo Moro" (Bari, Italy).
Patent applications (2): 1. *U.S. and Foreign Patent* No. 61/617,427 “Combination of DNA Repair Inhibition with Bendamustine or Gemcitabine in the Treatment of Cancer” (Inventors: A. Bellacosa, V. Bhattacharjee, N. Beeharry, M. Smith, P. Mancuso, R**. Tricarico** and T. Yen); 2. *U.S. and Foreign Patent* No. 61/884,478 “Inhibition of Thymine DNA Glycosylase in the Treatment of Cancer” (Inventors: A. Bellacosa, V. Bhattacharjee, I. Davidson, L. Larue, P. Mancuso, **R. Tricarico** and T. Yen)

Bibliometric indicators (April 2024):
ORCID: 0000-0001-7055-7208
H-index (source: Scopus) = 15;
Total number of citations (source: Scopus): 852