

# SIMONA GIUNTA, Ph.D.

*Rita Levi Montalcini Associate Professor & Head of Laboratory of Genome Evolution*

## **PROFESSIONAL STATEMENT**

Having worked in some of the world's most renowned research environments across three continents, I have established a unique research niche focused on human centromere maintenance, building on my long-standing interest and expertise in genome stability and repetitive DNA. Innovation is a strong part of my *modus operandi* in my multidisciplinary group bringing together cutting-edge technologies, experimental approaches and overall strategies in the pursuit of a better understanding of centromere instability and its implications in human disease.

## **EDUCATION**

- 2006-2011    **Ph.D. in Cancer Research** (Mentor: Prof. Steve P. Jackson)  
*Laboratory of DNA Damage Response, University of Cambridge, UK*
- 2006         **Diploma of Industrial Training in Developmental Biology**  
*National Institute for Medical Research MRC, London, UK*
- 2002-2006   **B.Sc. (First Class Honors) in Cancer Biology – Summa cum laude**  
*Brunel University, London, UK*
- 1997-2002   **Diploma of Liceo Classico Sperimentale “Brocca” – Final grade: 99/100**  
*Liceo Statale Democrito, Rome, Italy*

## **RESEARCH EXPERIENCE**

- From 2023    **Associate Professor; Sapienza University of Rome, Rome, Italy**  
This Professorship represents a lifetime, tenured position in Italy, that comprises mentorship, teaching and academic engagements in addition to my primary role as the Director of my research team of over 10 people.
- From 2021    **Head of Laboratory of Genome Evolution; Sapienza University of Rome, Rome, Italy**  
The Giunta Lab has launched comprehensive high-throughput studies of genome stability at DNA repeats in the Department of Biology & Biotechnology Charles Darwin funded by an AIRC Start-Up grant.
- 2020-2023    **Rita Levi Montalcini Assistant Professor; Sapienza University of Rome, Rome, Italy**  
Tenure-track position awarded by the Italian Ministry of Education ‘Bring back the Brains’ initiative.
- 2021         **Visiting Faculty; The Rockefeller University, New York, USA**  
Continued access as Assistant Professor to Laboratory space, Facilities & Resources at Rockefeller University.
- 2016-2020    **Research Associate; The Rockefeller University, New York, USA**  
Head of projects on aging and cancer-associated centromere instability using AID & imaging technologies.
- 2011-2016    **Post-doctoral Fellow; The Rockefeller University, New York, USA**  
Leader of project on the design of innovative FISH techniques applied to super-resolution microscopy to study stability and structure of human centromeres. Collaborator on ageing reversal screening in iPSC.
- 2011         **Research Fellow; Nutrition and Health Research Clinic, CSIRO, Adelaide, Australia**  
Research Fellow with a Technology Transfect Fellowship from UICC to learn the CBMN, (aTL)qPCR and other advanced assays and study the effects of resveratrol in protecting from oxidative damage.

## **RESEARCH EXPERIENCE – Continued**

2006-2011 **Ph.D. Student in Cancer Research**; *University of Cambridge, UK*

Principal researcher on the discovery of the human mitotic DNA damage response, published as first author in 2010 (over 300 citations) and 2011. Proteomics of Rad9 and GINS during replication in *S. cerevisiae*.

2006 **Research Intern**; *Barts & The London Medical School, UK*

Experimental thesis project on the role of the WNT pathway in Chronic Lymphocytic Leukemia (CLL)

2004-2005 **Research Assistant**; *National Institute for Medical Research MRC, London, UK*

Study of STAT-3 role in modulating the WNT pathway during cell migration in zebrafish embryogenesis.

2004 **Summer Research Intern**; *ILL / ESRF / EMBL, Grenoble, France*

Studying DNA conformations with X-rays and neutron diffractions by synchrotron and high-flux reactor.

## **TEACHING & MENTORING EXPERIENCE**

From 2021 **Supervisor and mentor of 4 BSc. Students; 2 MSc. Students; 3 Ph.D. students**

Also co-tutor of 1 Ph.D. Student and 1 Master Student. *Giunta Laboratory; Sapienza University of Rome.*

From 2022 **Professor of Cell Cycle – Master of Science**; *Sapienza University of Rome*

Shared course with Prof. Patrizia Somma for the MSc in Genetics & Molecular Biology.

From 2021 **Professor of Genome Evolution – Master of Science**; *Sapienza University of Rome*

Head of a 12 credits' course in Genome Evolution for the MSc in Genetics & Molecular Biology.

From 2021 **Professor in Cytogenetics – Bachelor of Science in Genetics**; *Sapienza University of Rome*

Teaching practical classes in Molecular Cytogenetics for the BSc in Food & Industrial Biotech (B.A.I.)

2013-2019 **Lecturer – CUNY Brooklyn College, NY, USA**

Teaching 4 graduate classes for the Cell Biology, Genetics and Molecular Biology Courses each semester.

Specific classes: Mutation and Cancer, DNA Damage Repair, Cell Cycle, Telomeres, Centromeres, Aging.

2017-2019 **Chair & Science Advisor – New Visions For Public Schools**

STEM Curricula Development advisor to meet 2020 education goals for High School Science in NY State.

2018 **Supervisor of Undergraduate Student** Ms. Elizabeth M. Black

*Rockefeller University Summer Undergraduate Research Fellowship, NY, USA*

2014 **Invited University Lecturer** on “Biochemistry and Metabolism of Cancer”

*Course: Biochemistry. BSc in Biological Sciences, CUNY Hunter College, NY, USA*

2012 **Supervisor of Undergraduate Student** Ms. Jessica Kim

*Rockefeller University Summer Undergraduate Research Fellowship, NY, USA*

2010 **Invited Post-graduate Lecturer** on “DNA Damage Repair during the Cell Cycle”

*Doctorate Department of Biological Sciences, University of Rome III, Italy*

2009-2010 **Supervisor and Laboratory Demonstrator – Dept. Of Zoology, University di Cambridge, UK**

Teaching Biochemistry, Cytogenetic, Physiology and Cell Biology classes with associated labs.

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## **RESEARCH FUNDING**

- 2022 ERC Starting Grant Award “CENTROFUN” Project (*ERC, EU*) – €1,500,000.00 over 5 years.
- 2022 Co-PI, Interstellar Initiative “Beyond” - Collaboration with Germany/Italy/Japan, *AMED, JP*.
- 2022 Participant, Research Funding on Ancient DNA and Archeogenetic Analysis from the Copper Age with Prof. Trombetta – Progetti Medi *Sapienza University of Rome*
- 2021 PI, AIRC Start-up Grant #25189, *AIRC (Italy)* – €1,000,000.00 over 5 years.
- 2020 Co-PI, Interstellar Early Career Investigator Award, *New York Academy of Science & AMED*.
- 2020 Participant, Scientific Instrumentation Funding “RARITY: RAdiation and microgRavITY machinery to study the effects of ionizing radiation under low gravity” – *Medi Sapienza University*.
- 2020 Participant, Research Funding “Comparative analysis of stem cell compartments in mouse model of physiologic and accelerated aging syndromes” with I.Saggio – Prog. Piccoli *Sapienza University*
- 2019 PI, SEAL of SapiExcellence, *1-year Research Funding awarded by Sapienza University, Italy*.
- 2018 Fellow, MSCA Marie Curie Action Reintegration (fully funded) Fellowship, *Horizon 2020*
- 2018 Main scientist, *NIH R01 Grant GM121062 Centromere Integrity*. Impact F.: 20; 5<sup>th</sup> percentiles.
- 2013-2015 Collaborator, *Tri-Institutional Stem Cell Initiative from STARR Consortium #2013-049, USA*.
- 2012-2014 Fellow, *American Italian Cancer Foundation Fellowship, USA*.
- 2012-2013 Fellow, *Women & Science Initiative Fellowship, USA*.
- 2011 Research Funding, *ICRETT Technology Transfer Fellowship, UICC*.
- 2006-2010 Ph.D. Full Fellowship, *Biotechnology and Biological Sciences Research Council, UK*
- 2006-2010 Cooperative Award in Science and Engineering (CASE) Scholar. *KuDOS/AstraZeneca, UK*
- 2002-2006 Full Scholar, *EU Excellence Academic Scholarship* toward the University fee.

## **AWARDS & RECOGNITIONS**

- 2023 “Scientific Commissioner” by direct nomination of the *Magnificent Rector* for the “Commissione Istruttoria Dottorati di Ricerca” Decreto n.135/2023 Prot.n. 0007189 Ph.D. Program *Sapienza University of Rome*
- 2022 *Interstellar Early Career Investigator Beyond Initiative* to our international team (Italy, Germany, Japan) aiming to address colorectal tumor relapse by targeting quiescent stem cells.
- 2021 *Interstellar Early Career Investigator Best Scientific Proposal* to our international team (Italy, Japan, Canada) aiming to correct genome instability using nanoparticle delivery system in atherosclerosis.
- 2019 *Rita Levi Montalcini Assistant Professorship Award* by the *Italian Ministry of Education*
- 2018 Rockefeller University Post-doctoral Association *Career Development Award*
- 2017 Seal of Excellence *Horizon 2020 European Union MSCA* – 93% score.
- 2016 *American Society For Cell Biology (ASCB) Travel Award*
- 2016 Rockefeller University Post-doctoral Association *Career Development Travel Award*
- 2010 Graduate Student Award – Runner-up. *Dept. of Zoology, University of Cambridge, UK*
- 2009 First Prize Young Scientist Award for Best Talk. *EU-IP DNA Repair Workshop, Sicily*.
- 2006 *Margaret Trier Memorial Prize*. Awarded annually to a woman selected from all Brunel graduates based on excellence in her final thesis and accomplishments throughout undergraduate career.

## **SELECTED PRESENTATIONS – Non exhaustive**

- 2022 Invited Speaker; *NYU Seminar at Langone Medical School* “Protecting our genome”, NY, USA
- 2020 “The Socially Distant Centromere” Opening Meeting – Online Conference series replacing GRC.
- 2019 Discussion leader “Medical genomics: where are we at?”, *ASCB/EMBO 2019 Washington D.C.*
- 2019 Invited Speaker; *NYU Chromatin Club*, NY, USA
- 2018 Selected Speaker; *Gordon Research Conference (GRC) “Centromere Biology”* Vermont, USA
- 2018 Selected Speaker; *Anderson Center for Cancer Research Retreat*, NY, USA
- 2017 Invited Speaker; *Genetic Society of America “Repetitive DNA” Symposium*, NYU, NY, USA
- 2017 Selected Speaker; *Gordon Research Conference (GRC) “Chromosomes Dynamics”* Il Ciocco, Ita
- 2017 Selected Speaker; *New York Academy of Science (NYAS) “Genome Integrity DG”*, NY, USA
- 2016 Selected Partecipant; *ASCB Conference & Doorstep Cancer Meeting*; ASCB 2016, SF, USA

### **SELECTED PRESENTATIONS – Non exhaustive. Continued**

- 2015 Selected Participant; *Genome Engineering GE 3.0 CRISPR Workshop*, Broad, Boston
- 2013 Invited Speaker; *Workshop SIMA Italian Society for Mutagenesis “Chromosome Instability”*, Ita
- 2012 Invited Speaker; *XII Convegno Federazione Italiana Scienza della Vita (FISV)*, Roma, Italy
- 2012 Selected Participant & Poster; *EMBO Workshop “Centromeres and Kinetochores”*; Barcelona
- 2010 Selected Poster; *“Maintenance of Genome Stability” International Abcam Conference*; Antigua
- 2009 Selected Speaker & Poster; *3<sup>rd</sup> EU-IP DNA Repair Workshop for Young Scientists*, Taormina, Ita
- 2008 Selected Speaker; *2<sup>nd</sup> EU-IP DNA Repair Workshop for Young Scientists*, Porto, Portugal

### **PROFESSIONAL MEMBERSHIPS**

Life member of St John’s College, University of Cambridge; American (ASCB) and British (BSCB) Societies for Cell Biology; American Association for the Advancement of Science (AAAS); New York Academy of Sciences (NYAS); Genetic Society of America (GSA); International Union for Cancer (UICC); Italian Association of Genetics (AGI); European Environmental Mutagenesis and Genomics Society (EEMGS); Italian Federation for Life Sciences (FISV); Italian Society of Environmental and Genomic Mutagenesis (SIMAG).

### **EDITORIAL & MANAGERIAL EXPERIENCE**

- Reviewer for PNAS; Scientific Reports; Ecotoxicology & ES; Elsevier, Wiley, MDPI Journals, etc.  
Grant reviewer for the Italian Ministry for University and Research (MUR), Progetti di Rilevante Interesse Nazionale (PRIN), Agence Nationale De La Recherche (France) and other International Grant agencies.
- 2022 Invited Editor for *Seminars in Cell & Developmental Biology* (Elsevier) “Maintenance of Satellite DNA Stability” Special Issue (ISSN: 1084-9521).
  - 2021 Co-Founder with Dr. Santaguida of the “Genome Integrity Italian Network” ([GiIN](#)), Italy.
  - 2020 Guest Editor for *Genes* Special Issue: “[Centromeres in Genome Stability](#)” (ISSN: 2073-4425).
  - 2019 Editor for Cancer Research Frontiers, open access peer-reviewed journal (ISSN: 2328-5249).
  - 2013-2019 Founding President of *Know Science, Inc.* a non-profit organization for science literacy.
  - 2012-2019 Director and Scientific Editor. *The Rockefeller University Science Communication Group*.
  - 2012-2014 Scientific Consultant. *GE Healthcare, MackSense* and other market research agencies.
  - 2007-2010 Founder and President. *The St John’s Women’s Society, University of Cambridge, UK*
  - 2007-2009 Science Editor in Chief. *The Cambridge Student newspaper* (TCS; 10,000 copies weekly).

### **PUBLICATIONS**

- Bosco N, Goldberg A, Zhao X, Mays JC, Cheng P, Johnson AF, Bianchi JJ, Toscani C, Di Tommaso E, Katsnelson L, Annuar D, Mei S, Faitelson RE, Pesselev IY, Mohamed KS, Mermerian A, Camacho-Hernandez EM, Gionco CA, Manikas J, Tseng YS, Sun Z, Fani S, Keegan S, Lippman SM, Fenyö D, [Giunta S](#), Santaguida S, Davoli T. **2023** ‘KaryoCreate: A CRISPR-based technology to study chromosome-specific aneuploidy by targeting human centromeres’. doi: 10.1016/j.cell.2023.03.029.
  - Di Tommaso E, de Turris V, Choppakatla P, Funabiki H, [Giunta S](#) †. **2023** ‘Visualization of the three-dimensional structure of the human centromere in mitotic chromosomes by super-resolution microscopy’. *Mol Biol Cell*. doi: 10.1091/mbc.E22-08-0332.
  - Said M, Barra V, Balzano E, Talhaoui I, Pelliccia F, [Giunta S](#), Naim V. **2022** ‘FANCD2 promotes mitotic rescue from transcription-mediated replication stress in SETX-deficient cancer cells’. *Commun Biol*. 21;5(1). doi: 10.1038/s.42003-022-04360.
  - Balzano E, Di Tommaso E, Antoccia A, Pelliccia F†, [Giunta S](#)†. **2022** ‘Characterization of Chromosomal Instability in Glioblastoma’. *Frontiers in Genet*. 12(1-12). doi: 10.3389/fgene.2021.810793.
  - [Giunta S](#)†. **2021** ‘Decoding Human Cancer With Whole Genome Sequencing’. *Cancer Met Rev*, 7:1-16
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- **Giunta S<sup>†</sup>\***, Herve S, \* White R, Wilhelm T, Dumont M, Wong CK, Rancati G, Smogorzewska A, Funabiki H<sup>†</sup>, Fachinetti D<sup>†</sup>. **2021** 'CENP-A preserves genome integrity during alpha-satellite DNA replication by modulating R-loops at human centromeres'. *PNAS*, 9;118(10):e2015634118 [BioRxiv](#) doi.org/10.1101/2020.09.01.277103 Highlighted by *The Company of Biologists*
- Balzano E, Pelliccia F, **Giunta S<sup>†</sup>**. **2021** 'Genome (in)stability at tandem repeats'. *Seminar in Cell & Developmental Biology*, S1084-6.
- Balzano E & **Giunta S<sup>†</sup>**. **2020** 'Centromeres under Pressure: Evolutionary Innovation in Conflict with Conserved Function'. *Genes*, 11(8):912.
- Leo L, Marchetti M, **Giunta S**, Fanti L. **2020** 'Epigenetics as an Evolutionary Tool for Centromere Flexibility'. *Genes*, 11(7):809.
- Burla R, La Torre M, Maccaroni K, Verni F, **Giunta S**, Saggio I. **2020** 'Nuclear envelope and chromatin organization in physiology and pathology'. *Nucleus*, 11(1):205-218.
- Maccaroni K, Balzano E, Mirimao F, **Giunta S<sup>†</sup>**, Pelliccia F<sup>†</sup>. **2020** 'Impaired replication timing promotes tissue-specific expression of common fragile sites'. *Genes*, 11, 326.
- Black EM & **Giunta S<sup>†</sup>**. **2018** 'Repetitive Fragile Sites: Centromere Satellite DNA as a Source of Genome Instability'. *Genes*, 9, 615.
- **Giunta S<sup>†</sup>**. **2018** 'Centromere Chromosome Orientation Fluorescent *In Situ* Hybridization (Cen-CO-FISH) detects Sister Chromatids Exchange at Centromeres in Human Cells'. *Bio-protocol*, 7(8), e2792.
- Jenness C, **Giunta S**, Muller MM, Kimura H, Muir TW, Funabiki H. **2018** 'HELLS and CDCA7 comprise a bipartite nucleosome remodeling complex defective in ICF syndrome' *PNAS*, 45, 201717509.
- Skamagki M, Correia C, Yeung P, Baslan T, Beck S, Zhang C, Ross CA, Dang L, Liu Z, **Giunta S**, et al. **2017** 'ZSCAN10 corrects the genomic instability of iPSC from aged donors', *Nature Cell Biology* 19(9), 1037-48.
- **Giunta S<sup>†</sup>** & Funabiki H<sup>†</sup>. **2017** 'Integrity of the human centromere DNA repeats is protected by CENP-A CENP-C and CENP-T'. *Proceedings of the National Academy of Science (PNAS)* 114(8), 1928-33
- Valdiglesias V\*, **Giunta S\***, Neri M, Bonassi S. **2013** 'γH2AX as a marker of DNA double strand breaks and genomic instability in human population studies'. *Mutation Research* 753(1), 24-40
- **Giunta S** & Jackson SP. **2011** 'Give me a break, but not in mitosis: The mitotic DNA damage response marks DNA double strand breaks with early signaling events'. *Cell Cycle* 10, 1215-21.
- **Giunta S\***, Belotserkovskaya R\*, Jackson SP. **2010** 'DNA damage signalling in response to double strand breaks during the cell cycle phase of mitosis'. *Journal of Cell Biology* 190, 197-207.  
Highlighted by [Journal of Cell Biology](#) and [Nature Reviews Cancer](#).
- **Giunta S**. **2009** 'A gust of WNT: Analysis of the canonical WNT pathway'. *ACTA Biomed* 81(3), 187-99

**LEGEND:** † Corresponding author. \* Equal contribution

