

Curriculum Vitae RANALLO Simona

PERSONAL INFORMATION

First name/family name: Simona Ranallo

Date and place of birth: 20/05/1987, Rome, Italy

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EDUCATION

- Febr. 2017 **Ph.D in Chemical Science (Analytical Chemistry)**, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy
Supervisor: Prof. Francesco Ricci
- May 2013 **M.S. (Chemistry, Summa cum Laude)**, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy
Supervisor: Prof. Francesco Ricci

CURRENT POSITION

- Jun. 2025 – current **Associate Professor, Group Leader of NanoSynBio - Ranallo Lab**, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy



PROFESSIONAL EXPERIENCE

- Mar. 2023 – May 2025 Assistant Professor, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy.
- Mar. 2020 – Feb. 2023 Post-Doc, Marie Skłodowska-Curie Individual Fellowship (DNA-NANO-AB) within Horizon 2020 Framework Programme, University of California, Santa Barbara (Prof. K.W. Plaxco).
- Mar. 2019 – Feb. 2020 Post-Doc fellow, Fondazione Umberto Veronesi, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy
- Nov. 2016 – Jan. 2020 Post-Doc researcher, Department of Chemical Science and Technologies, University of Rome Tor Vergata, Italy
- May 2015 – Sep. 2015 Visiting researcher, University of Montreal (Prof. Alexis Vallé-Belisle).
- Jan. 2015 – Mar. 2015 Visiting researcher, University of California, Santa Barbara (Prof. Kevin W. Plaxco).
- Sep. 2012 – Jan. 2013 Visiting student, University of California, Santa Barbara (Prof. Kevin W. Plaxco).

CURRENT RESEARCH INTERESTS

DNA Nanotechnology, Synthetic Biology, cell-free systems, DNA-based sensors, Aptamers, RNA Therapeutics, Diagnostic tools, Optical and Electrochemical sensors, Analytical Chemistry, Bioengineering.

The research group aims to combine the high programmability of DNA Nanotechnology and the specificity and sensitivity of cell machinery to develop cell-free systems that, in response to a wide range of biomarkers can trigger the transcription of functional RNAs that can provide a signal or have a therapeutic function.

AWARDS

- Nov. 2025 “Medaglia Ivano Bertini 2025” awarded by the Italian Chemical Society to researchers under 40 recognized. Award given for the exceptional intellectual rigor, the originality of research in DNA nanotechnology, the strong record in securing highly competitive funding, and the commitment to advancing innovative research through technology transfer.
- Dec. 2024 FIS 2 – Fondo Italiano per la Scienza – MUR (“SYNTRA”)
- Jul. 2024 ERC Starting Grant (“CO-TRANS-NET”).
- Jul. 2024 National Scientific qualification as Associate Professor
- Jul. 2024 Finalist of the European Young Chemist Award (EYCA) - European Chemical Society, EuChemS
- Mar. 2022 “Cristina Giovannoli” award for the research excellence in the field of Bioanalytical Chemistry of a young researcher (<35 years) given by the Italian Chemical Society.
- Jul. 2022 Finalist of the European Young Chemist Award (EYCA) - European Chemical Society, EuChemS
- Oct. 2020 “2019 Primo Levi” award for the best research chemistry-related paper of the year given to a researcher (<35 years) by the Italian Chemical Society.

Feb. 2019 Marie Skłodowska Curie – Individual Postdoctoral Fellowship Programma Horizon 2020.
Jan. 2019 Post-Doctoral Fellowship, Fondazione Umberto Veronesi for cancer research.
Sept. 2014 “Premio Tesi di Laurea 2014”, Analytical Chemical Division of the Italian Chemical Society.

RESEARCH GRANTS

Year	Budget (€)	Role	Funding Body/Title
2024	1330000	P.I.	FIS 2 “SYNTRA” – Fondo Italiano per la Scienza – MUR.
2024	1499750	P.I.	ERC Starting Grant 2024 “CO-TRANS-NET” - European Research Council.
2019	251000	P.I.	MSCA Individual Global Fellowship “DNA-NANO-AB”- European Commission

VISITING PERIODS

Jan. 2015 – Feb. 2022 Post-Doc and visiting researcher at the University of California, Santa Barbara (UCSB) (>2.5 years during 2 different visiting periods).
May 2015 – Sep. 2015 Visiting researcher at the Department of Chemistry, University of Montréal, Canada.
Sep. 2012 – Jan. 2013 Visiting student at the University of California, Santa Barbara (UCSB).

PATENTS

- 1) “CELL-FREE TRANSCRIPTIONAL ELECTROCHEMICAL BIOSENSORS FOR DETECTING MOLECULAR ANALYTES, AND METHOD THEREOF”. (PCT/IB2023/060468, WO 2024/084389 A1).
- 2) “DNA-ENZYME CONJUGATES FOR SPECIFIC AND ULTRA-SENSITIVE DETECTION OF A TARGET ANALYTE, AND METHOD THEREOF”. (PCT /B2024/056486, WO 2025/008758 A1).

INVITED/KEYNOTE LECTURES

Dec. 2025 Pacific Chem 2025, The International Chemical Congress of Pacific Basin Societies 2025, Honolulu, Hawaii.
Nov. 2025 Avogadro Colloquia 6th edition, Chemistry for a better life: solution to health challenges, Rome, Italy.
Nov. 2025 Premi Rosalind Franklin, University of Rome Tor Vergata, Rome, Italy.
June 2025 12th Conference on DNA Nanotechnology, Chengdu, China.
Jun. 2025 SupraChemDays 2025, Salerno, Italy.
Apr. 2025 ACS on Campus, Sapienza University of Rome, Italy.
Mar. 2025 ICSM symposium, Eindhoven University of Technology, Eindhoven, The Netherland.
Oct. 2024 Women in Science, NANOBALKAN 2024 Conference, Tirana, Albania.
Oct. 2023 NANOBALKAN 2023 Conference, Tirana, Albania.
Mar. 2023 Giornate di Bioanalitica 2023, Florence, Italy.
May 2022 Lecture at the University of Teramo, Italy.
Mar. 2022 Seminar at the Eindhoven University of Technology, Eindhoven, The Netherland.
Feb. 2022 Lecture at University of California Los Angeles (UCLA), Los Angeles, United States
Oct. 2017 Eight International Workshop on Biosensors for Food Safety and Environmental Monitoring, Rabat, Morocco.
Sep. 2017 XXVI National Congress of the Italian Chemical Society, Paestum, Italy.

Beyond the invited and keynote lectures listed above, I have delivered more than 30 contributed presentations at major national and international conferences.

PUBLICATIONS

24 publications in peer-review journals + 2 patents.

15 papers in journal with impact factor (IF) > 10 (3 Nat. Commun., 7 Ang. Chem. Int. Ed., 1 J. Am. Chem. Soc., 1 Small, 1 Nucleic Acid Res., 1 TRACS, 1 ACS Appl. Mater. Interfaces). 9 papers in journal with impact factor (IF) > 5 (1 Anal. Chem., 3 ACS Sensors, 1 iScience, 2 Chem. Sci., 1 Anal. Bioanal. Chem., 1 Bioconj. Chem.).

7 papers as first author + 2 papers as first and co-corresponding author + 6 papers as co-corresponding author.

H index = 17; Total citations = 891 (Scopus, May 2026).



LIST OF PUBLICATIONS

- [24] Aguiar J, **Ranallo S***, Ricci F. Tune, extend and narrow the useful dynamic range of cell-free transcription biosensors through programmable DNA-based stem-loop hairpin reporters. **Angew. Chem. Int. Ed.** 2026, 65, e8143908.
- [23] Miceli FC, Bracaglia S, Sorrentino D, Porchetta A, **Ranallo S***, Ricci F. MAIGRET: a CRISPR-based immunoassay that employs antibody-induced cell-free transcription of CRISPR guide RNA strands. **Nucleic Acids Res.** 2025, 56, gkaf238.
- [22] Sorrentino D, **Ranallo S**, Ricci F, Franco E. Developmental assembly of multi-component polymer systems through interconnected synthetic gene networks in vitro. **Nat. Commun.** 2024, 15, 8561.
- [21] Sorrentino D, **Ranallo S**, Nakamura E, Franco E, Ricci F. Synthetic Genes For Dynamic Regulation Of DNA-Based Receptors. **Angew. Chem. Int. Ed.** 2024, 63, e202319382.
- [20] Del Giovane S, Bagheri N, Di Pede AC, Chamorro A, **Ranallo S**, Migliorelli D, Burr L, Paoletti S, Altug H, Porchetta A. Challenges and perspectives of CRISPR-based technology for diagnostic applications. **Trends Anal. Chem.** 2024, 172, 117594.
- [19] Fernandez-Diaz A, **Ranallo S***, Ricci F. Enzyme-Linked DNA Displacement (ELIDIS) Assay for Ultrasensitive Electrochemical Detection of Antibodies. **Angew. Chem. Int. Ed.** 2024, 63, e202314818.
- [18] Mariottini D, Bracaglia S, Barbero L, Fuchs SW, Saal C, Moniot S, Kneuhl C, Baranda L, **Ranallo S***, Ricci F. Bispecific Antibody Detection Using Antigen-Conjugated Synthetic Nucleic Acid Strands. **ACS Sensors** 2023, 8, 4014-4019.
- [17] **Ranallo S***, Bracaglia S, Sorrentino D, Ricci F. Synthetic Antigen-Conjugated DNA Systems for Antibody Detection and Characterization. **ACS Sensors** 2023, 8, 2415-2426.
- [16] Bracaglia S, **Ranallo S***, Ricci F. Electrochemical cell-free biosensors for antibody detection. **Angew. Chem. Int. Ed.** 2023, 62, e202216512.
- [15] Wu Y, **Ranallo S**, Del Grosso E, Chamorro-Garcia A, Ennis HL, Milosavić N, Yang K, Kippin T, Ricci F, Stojanovic M, Plaxco KW. Using Spectroscopy to Guide the Adaptation of Aptamers into Electrochemical Aptamer-Based Sensors. **Bioconjugate Chem.** 2023, 34, 1, 124-132.
- [14] Patino Diaz A, Bracaglia S, **Ranallo S**, Patino T, Porchetta A, Ricci F. Programmable Cell-Free Transcriptional Switches for Antibody Detection. **J. Am. Chem. Soc.** 2022, 144, 13, 5820-5826.
- [13] **Ranallo S***, Sorrentino D, Delibato E, Ercolani G, Plaxco KW, Ricci F. Protein-Protein Communication Mediated by an Antibody-Responsive DNA Nanodevice. **Angew. Chem. Int. Ed.** 2022, 61, e202115680.
- [12] Pfeiffer M, Trofymchuk K, **Ranallo S**, Ricci F, Steiner F, Cole F, Glembockyte V, Tinnefeld P. Single antibody detection in a DNA origami nanoantenna. **iScience** 2021, 24, 103072.
- [11] Sorrentino D, **Ranallo S**, Ricci F. Rational Control of the Activity of a Cu²⁺-Dependent DNAzyme by Re-engineering Purely Entropic Intrinsically Disordered Domains. **ACS Appl. Mater. Interfaces** 2020.
- [10] Bracaglia S, **Ranallo S***, Plaxco KW, Ricci F. Programmable, Multiplexed DNA Circuits Supporting Clinically Relevant, Electrochemical Antibody Detection. **ACS Sensors** 2021, 6, 2442-2448.
- [9] **Ranallo S**, Sorrentino D, Ricci F. Orthogonal regulation of DNA nanostructure self-assembly and disassembly using antibodies. **Nat. Commun.** 2019, 10, 5509.
- [8] Rossetti M, Del Grosso E, **Ranallo S**, Mariottini D, Idili A, Bertucci A, Porchetta A. Programmable RNA-based systems for sensing and diagnostic applications. **Anal. Bioanal. Chem.** 2019, 411, 4293-4302.
- [7] **Ranallo S**, Porchetta A, Ricci F. DNA-Based Scaffolds for Sensing Applications. **Anal. Chem.** 2019, 1, 44-59.
- [6] **Ranallo S**, Prévost-Tremblay C, Idili A, Vallée-Bélisle A, Ricci F. Antibody powered nucleic acid release using a DNA-based nanomachine. **Nat. Commun.** 2017, 8, 15150.

[5] Rossetti M, **Ranallo S**, Idili A, Palleschi G, Porchetta A, Ricci F. Allosteric DNA nanoswitches for controlled cargo triggered by biological inputs. **Chem. Sci.** 2017,8, 914-920.

[4] Jeong H, **Ranallo S**, Rossetti M, Heo J, Shin J, Park K, Ricci F, Hong J. Electronic Activation of a DNA Nanodevice Using a Multilayer Nanofilm. **Small** 2016,12, 40, 5572-5578.

[3] Della Sala F, Chen J, **Ranallo S**, Badocco D, Pastore P, **Ricci F**, Prins L J. *Reversible Electrochemical Modulation of a Catalytic Nanosystem*. **Angew. Chem. Int. Ed.** 2016, 55, 10737-10740.

[2] **Ranallo S**, Amodio A, Idili A, Porchetta A, Ricci F. Electronic control of DNA-based nanoswitches and nanodevices. **Chem. Science** 2016, 7, 66-71.

[1] **Ranallo S**, Rossetti M, Plaxco KW, Vallée-Bélisle A, Ricci F. A modular, DNA-based beacon for single-step fluorescence detection of antibodies and other proteins. **Angew. Chem. Int. Ed.** 2015, 54, 13214-13218.

MEDIA/PRESS COVERAGE

- Dec 2019 "Scientists use antibodies to build nanostructures", The Science Advisory Board
- Dec 2019 "Hiring antibodies as nanotechnology builders", Phys.org.
- Dec 2019 "Hiring antibodies as nanotechnology builders", NanoWerk
- May 2017 "Creata una "fionda molecolare" per l'utilizzo mirato dei farmaci", SKY TG24
- May 2017 "Medicina di precisione: la nanomacchina italo-canadese per portare farmaci dove serve", Focus
- May 2017 "Molecular "slingshot" releases drugs at specific targets", The Engineer
- May 2017 "Slingshot to shoot drugs onto the site of an infection", Science Daily
- May 2017 "Un fionda molecolare per portare i farmaci solo dove servono", Galileo
- May 2017 "Fionda molecolare con rilascio mirato farmaci", ADNKronos
- May 2017 "Molecular slingshot made from DNA shoots drugs to targeted locations in the body", E&T Magazine
- May 2017 "Molecular Slingshot Made of DNA Developed as a Novel Drug Delivery System", GEN
- May 2017 "Università degli Studi di Roma "Tor Vergata": Una fionda molecolare per il rilascio mirato di farmaci", Le Scienze
- Nov 2015 "A Modular, DNA-Based Beacon for Single-Step Fluorescence Detection of Antibodies and Other Proteins", F1000Prime
- Oct 2015 "Detecting HIV diagnostic antibodies with DNA nanomachines: A nanoscale machine composed of synthetic DNA can be used for the rapid, sensitive and low-cost diagnosis of many diseases, including HIV", ScienceDaily
- Oct 2015 "Des nanomachines pour détecter des maladies graves", TVA Nouvelles
- Oct 2015 "Tiny DNA 'machine' could cut HIV diagnosis cost", NDTV
- Oct 2015 "Press release: Detecting HIV diagnostic antibodies with DNA nanomachines", Nanotechweb
- Oct 2015 "New nanometer-scale DNA machine can be used for detecting HIV diagnostic antibodies", Health Medicine Network
- Oct 2015 "Detecting HIV Diagnostic Antibodies with DNA Nanomachines", NewsWise
- Oct 2015 "New nanometer-scale DNA machine can be used for detecting HIV diagnostic antibodies", News Medical Life Science and Medicine

CONFERENCES (ORGANIZATION)

- Oct. 2025 7th Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
- Apr. 2025 Giornate di Bioanalitica 2025 della Società Chimica Italiana, Rome, Italy (Organizing Committee)
- Dec. 2023 GS23, Workshop del gruppo interdivisionale Sensori della Società Chimica Italiana, Rome, Italy (Organizing Committee)
- May 2022 5th Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
- Oct. 2020 4th Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
- Jun 2018 3rd Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
- Jun 2016 2nd Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
- Jun 2014 1st Functional DNA Nanotechnology Workshop, Rome, Italy (Local Organizing Committee)
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REFEREE/REVIEWER ACTIVITIES

Nature Communication, Nature Methods, Angewandte Chemie International Edition, Advanced Functional Materials, ACS Synthetic Biology, ACS Sensors, Analytical Chemistry, etc.

TEACHING AND SUPERVISING ACTIVITY

Analytical Chemistry (C.L. Scienze dei Materiali, 9 CFU, 2023 - current); Laboratory of Bioanalytical Chemistry (C.L. Chimica e C.L. Chimica Applicata, 6 CFU, 2004 - current); Biosensor Technology (C.L. Biotechnology, 6 CFU, 2019 – current); Electroanalytical Chemistry (C.L. Chimica, 6 CFU, 2018 – 2022); Drug Analysis and Analytical Chemistry (C.L. Pharmacy, 8 CFU, 2015-2020).

Supervision: 10 master students, 10 PhD, 6 Post-Doc.

MEMBER OF PhD COMMITTEE

Jun. 2026	Anna Swietlikowska, Eindhoven University of Technology (TU/e), advisor: Maarten Merkx.
Jul. 2025	Massimo Urban, Universitat Autònoma de Barcelona, advisor: Arben Merkoci.