



Alessandro Porchetta

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CURRICULUM VITAE

Date of Birth 06/10/1984
Sex Male
Nationality Italian

PROFESSIONAL EXPERIENCE

Sep 2024 - current **Member of the Academic Senate**, University of Rome, Tor Vergata, Italy
Apr 2022 - current **Associate Professor**
Chemistry Department, University of Rome, Tor Vergata, Italy
Apr 2019 – Apr 2022 **Tenure Track Assistant Professor**
Chemistry Department, University of Rome, Tor Vergata, Italy
Apr 2016 – April 2019 **Senior Researcher**
Chemistry Department, University of Rome, Tor Vergata, Italy
Feb 2014 - Mar 2016 **Post-doctoral Researcher**
Chemistry Department, University of Rome, Tor Vergata, Italy
Laboratory of Prof. **Giuseppe Palleschi**

CURRENT RESEARCH INTERESTES

CRISPR-Cas technology, DNA Nanotechnology, biomolecular sensors, biomolecular condensates,

EDUCATION

Ph.D. – Chemical Sciences Jan 2014, Chemistry Department, University of Rome Tor Vergata, Italy
Supervisor: Prof. F. Ricci **Final mark:** Excellent
Master degree – Chemistry (Physical Chemistry) May 2010, Chemistry Department, University of Rome Tor Vergata, Italy
Supervisor: Prof. M. Venanzi **Final score:** 110/110 cum laude

AWARDS

June 2018 **"The European Young Chemist Awards (EYCA)"** (post-doc level) recognized at the EuChemES Conference 2018 (sponsored by SCI, 1600 €).
May 2014 **"Primo Levi Award"** by the Italian Chemical Society for the best publication of 2014 (Young Chemistry Researchers Award, \$ 500).
May 2013 **"Primo Levi Award"** by the Italian Chemical Society - special mention by the Italian Chemical Society.

VISITING PERIODS

Dic 2019 – Jan 2020 **Visiting Researcher (as PI)**. Marie Curie Fellow (RISE project "NanoOligoMed"). ICMAB, Barcelona (Spain). **Prof. Nora Ventosa**.
Jun 2018 - Aug 2018 **Visiting Researcher (as PI)**. Marie Curie Fellow (RISE project "NanoOligoMed"). University of California, San Diego (UCSD). **Prof. Mike Sailor**.
Jan 2018 – Feb 2018 **Visiting Researcher**. IBEC Institute (Barcelona). Prof. **Samuel Sanchez**.
Dic 2014 - Feb 2015 **Visiting PhD student**. Marie Curie Fellow (Int. Res. Staff Exc. Scheme, IRSES). Shanghai Institute of Applied Physics, China. **Prof. Chunai Fan**.

Sep 2011 – Feb 2012 **Visiting PhD student.** Marie Curie Fellow (Int. Res. Staff Exc. Scheme, IRSES), Chemistry and Biochemistry Department, University of California, Santa Barbara. Prof. **Kevin W. Plaxco.**

RESEARCH GRANT

Year	Budget	Role	Funding Body/Title
2024	310 kEuro	Coordinator	PNRR-THE Spoke 4 "Bio-SilicaThera". End date 2025
2024	115 kEuro	P.I.	EU Marie Curie-Skolowoska Staff Exchange "Program-Material". End date 2028
2024	188 keuro	Coordinator	EU Marie Curie-Skolowoska Individual Fellowship "CRINOVA" (dr. A. Shana).
2023	105 kEuro	Coordinator	PRIN grant, Italian Ministry of Research and Education. "Ab-CRISPR" End date: 2025.
2023	500 kEuro	P.I.	"My First Airc Grant" - Cancer Research Foundation. "REPAIR-NANO". End date 2028
2023	115 kEuro	P.I.	EU Marie Curie-Skolowoska Staff Exchange "Nano-ImmunoEra". End date 2027
2018	20 kEuro	P.I.	University of Tor Vergata grant – "MIRA". Start date March
2017	135kEuro	P.I.	EU Marie Skłodowska-Curie RISE "Nano-OligoMed".

TEACHING ACTIVITIES

Sep 2025 - current	Biomolecular Sensors and Advanced Analytical Techniques Master degree in Chemistry, University of Rome, Tor Vergata (average enrolment: 25 students). 6 CFU
Sep 2019 - 2024	Applied Analytical Chemistry. Master degree in Chemistry, University of Rome, Tor Vergata (average enrolment: 25 students). 6 CFU
Jan 2017 – current	Fundamentals of Analytical Chemistry. Bachelor degree in Chemistry, University of Rome, Tor Vergata (average enrolment: 75 students). 6 CFU

PUBLICATIONS

51 papers in ISI peer-reviewed journals

H-index: 26 (Scopus)

2028 total citations (Scopus)

21 papers in journals with impact factor (IF) > 10 (8 *JACS* + 3 *Nano Letters* + 1 *Acc. Chem. Res.* + 6 *Ang. Chem. Int. Ed.* + 1 *Adv. Funct. Mater.* etc.)

LIST OF PUBLICATIONS

- 50 Ueno, K., Tsukakoshi, K., Takeuchi, N., Inaba, S., Idili, A., Porchetta, A., Ricci, F., Ikebukuro, K., (2025) Bright and pH-sensitive Baby Spinach aptamer with RNA triplex fusion ***Nucleic Acids Research***, 53(11), gkaf151
- 49 Di Lena, D., Sisti, E., Brass, E., Belforte, E., Marini, B., Porchetta, A., Squarcia, L., Da Pozzo, E., Bertucci, A., Ippodrino R., (2025) Rapid, Single-Step Monitoring of Monoclonal Antibody Bioavailability by Using a TNF- α -Based Multiepitope DNA Nanoswitch ***Analytical Chemistry***, 97(15), 8195–8201
- 48 Miceli, F., Bracaglia, S., Sorrentino, D., **Porchetta, A.**, Ranallo, S., Ricci, F., (2025) MAIGRET: a CRISPR-based immunoassay that employs antibody-induced cell-free transcription of CRISPR guide RNA strands ***Nucleic Acids Research***, 53(6), gkaf238
- 47 Paialunga, E., Bagheri, N., Rossetti, M., Fabiani, L., Micheli, L., Chamorro-Garcia, A., **Porchetta A.***, (2025) Leveraging Synthetic Antibody–DNA Conjugates to Expand the CRISPR-Cas12a Biosensing Toolbox ***ACS Synth. Biol.***, 14(1), 171–178
- 46 Capelli, L., Pedrini, F., Di Pede, A.C., Chamorro-Garcia, A., Bagheri, N., Fortunati, S., Giannetto, M., Mattarozzi, M., Corradini, R., **Porchetta, A.**, Bertucci, A. (2024) Synthetic Protein-to-DNA Input Exchange for Protease Activity Detection Using CRISPR-Cas12a ***Anal. Chem.*** 96 (47), 18645-18654.

- 45 Rivero-Hernández, A. L. et al. (2024) Decoupling immunomodulatory properties from lipid binding in the α -pore-forming toxin Sticholysin II. *Int. J. Biol. Macromol.*, 280, 136244.
- 44 Del Giovane, S., Bagheri, N., Di Pede, A.C., Chamorro, A., Ranallo, S., Migliorelli, D., Burr, L., Paoletti, S., Altug, H. **Porchetta, A.*** (2024). Challenges and perspectives of CRISPR-based technology for diagnostic applications. *TrAC Trends in Analytical Chemistry*, 117594.
- 43 Bagheri, N., Chamorro, A., Idili, A., **Porchetta, A.*** (2024). PAM-Engineered Toehold Switches as Input-Responsive Activators of CRISPR-Cas12a for Sensing Applications. *Angew. Chem. Int. Ed.*, 63(17), 29:e202319677.
- 42 Chamorro, A., Rossetti, M., Bagheri, N., **Porchetta, A.*** (2023). Rationally Designed DNA-Based Scaffolds and Switching Probes for Protein Sensing. In: *Advances in Biochemical Engineering/Biotechnology*. Springer, Berlin, Heidelberg.
- 41 Picchetti, P., Volpi, S., Rossetti, M., Dore, M.D., Trinh, T., Biedermann, F., Neri, M., Bertucci, A., **Porchetta, A.*** (co-corresponding author), Corradini, R. and Sleiman, H., (2023). Supramolecular Nucleic Acid-Based Organosilica Nanoparticles Responsive to Physical and Biological Inputs *J. Am. Chem. Soc.*, 145 (42), 22903–22912
- 40 Picchetti, P., Volpi, S., Rossetti, M., Dore, M.D., Trinh, T., Biedermann, F., Neri, M., Bertucci, A., **Porchetta, A.*** (co-corresponding author), Corradini, R. and Sleiman, H., (2023). Responsive Nucleic Acid-Based Organosilica Nanoparticles. *J. Am. Chem. Soc.*, 145 (42), 22896–22902
- 39 Luo, X., Saliba, D., Yang, T., Gentile, S., Mori, K., Garcia, P.I., Das, T., Bagheri, N., **Porchetta, A.**, Guarne, A. and Cosa, G., (2023). Minimalist Design of Wireframe DNA Nanotubes: Tunable Geometry, Size, Chirality, and Dynamics. *Angew. Chem. Int. Ed.*, p.e202309869.
- 38 Rossetti, M., Merlo, R., Bagheri, N., Moscone, D., Valenti, A., Saha, A., ... & **Porchetta, A.*** (corresponding author) (2022). Enhancement of CRISPR/Cas12a trans-cleavage activity using hairpin DNA reporters. *Nucleic Acids Res.*, 50(14), 8377-8391.
- 37 Fortunati, S., Vasini, I., Giannetto, M., Mattarozzi, M., **Porchetta, A.**, Bertucci, A. and Careri, M., (2022). Controlling dynamic DNA reactions at the surface of single-walled carbon nanotube electrodes to design hybridization platforms with a specific amperometric readout. *Anal. Chem.*, 94(12), 5075-5083.
- 36 Patino Diaz, A., Bracaglia, S., Ranallo, S., Patino, T., **Porchetta, A.** and Ricci, F. (2022). Programmable cell-free transcriptional switches for antibody detection. *J. Am. Chem. Soc.* 144(13), 5820-5826.
- 35 Zanut, A., Rossetti, M., Marcaccio, M., Ricci, F., Paolucci, F., **Porchetta, A.*** (co-corresponding author), & Valenti, G. (2021). DNA-Based Nanoswitches: Insights into Electrochemiluminescence Signal Enhancement. *Anal. Chem.*, 93(30), 10397-10402.
- 34 Rossetti, M., Stella, L., Morlà-Folch, J., Bobone, S., Boloix, A., Baranda, L., ... & **Porchetta, A.** (corresponding author) (2021). Engineering DNA-Grafted Quasomes as Stable Nucleic Acid-Responsive Fluorescent Nanovesicles. *Adv. Funct. Mater.*, 2103511.
- 33 Bertucci, A., Porchetta, A., Del Grosso, E., Patiño, T., Idili, A., & Ricci, F. (2020). Protein-Controlled Actuation of Dynamic Nucleic Acid Networks by Using Synthetic DNA Translators. *Angew. Chem. Int. Ed.*, 59(46), 20577-20581.
- 32 Rossetti, M., Bertucci, A., Patiño, T., Baranda Pellejero, L., & **Porchetta, A. (Corresponding Author)** (2020). Programming DNA-based systems through effective molarity enforced by biomolecular confinement. *Chem. Eur. J.*, 26, 9826-9834.
- 31 Rossetti, M., Del Grosso, E., Ranallo, S., Mariottini, D., Idili, A., Bertucci, A., & Porchetta, A. (2019). Programmable RNA-based systems for sensing and diagnostic applications. *Anal. Bioanal. Chem.*, 411(19), 4293-4302.
30. Arrabito, G., Cavaleri, F., **Porchetta, A.**, Ricci, F., Vetri, V., Leone, M., & Pignataro, B. (2019). Printing Life-Inspired Subcellular Scale Compartments with Autonomous Molecularly Crowded Confinement. *Adv. Biosystems*, 3(7), 1900023.

29. Mocenigo, M., **Porchetta, A. (Co-first author)**, Rossetti, M., Brass, E., Tonini, L., Puzzi, L., ... & Ippodrino, R. (2020). Rapid, Cost-Effective Peptide/Nucleic Acid-Based Platform for Therapeutic Antibody Monitoring in Clinical Samples. **ACS sensors**, 5(10), 3109-3115.
28. Rossetti, M., Brannetti, S., Mocenigo, m., Marini, B., Ippodrino, R., **Porchetta, A.*** (corr. author) (2020) Harnessing Effective Molarity to Design an Electrochemical DNA-based Platform for Clinically Relevant Antibody Detection **Ang. Chem. Int. Ed.** 132 (35), 15083-15088.
27. Ranallo, S., **Porchetta, A.*** (co-corr. author) Ricci, F., 2018. DNA-based scaffolds for sensing applications. **Anal. Chem.**, 91(1), 44-59.
26. Nascetti, A., Mirasoli, M., Marchegiani, E., Zangheri, M., Costantini, F., **Porchetta, A.**, Iannascoli, L., Lovecchio, N., Caputo, D., de Cesare, G. and Pirrotta, S., (2019) Integrated chemiluminescence-based lab-on-chip for detection of life markers in extraterrestrial environments. **Biosens. Bioelectron.**, 123, 195-203.
25. Mazzaracchio, V., Neagu, D., **Porchetta, A.**, Marcoccio, E., Pomponi, A., Faggioni, G., D'Amore, N., Notargiacomo, A., Pea, M., Moscone, D. and Palleschi, G. (2019) A label-free impedimetric aptasensor for the detection of Bacillus anthracis spore simulant. **Biosens. Bioelectron.**, 126, 640-646.
24. Petropoulos, K., Bodini, S.F., Fabiani, L., Micheli, L., Porchetta, A., Piermarini, S., Volpe, G., Pasquazzi, F.M., Sanfilippo, L., Moscetta, P., Chiavarini, S. (2019) Re-modeling ELISA kits embedded in an automated system suitable for on-line detection of algal toxins in seawater. **Sens. Actuators B. Chem.**, 283, 865-872.
23. Patino, T., **Porchetta, A.*** (co-first author), Jannasch, A., Lladó, A., Stumpp, T., Schäffer, E., Ricci, F. and Sanchez, S. (2019) Self-sensing enzyme-powered micromotors equipped with pH responsive DNA nanoswitches. **Nano lett.** doi:10.1021/acs.nanolett.8b04794 (*Featured in the Front Cover*)
22. Rossetti, M., Ranallo, S., Idili, A., Palleschi, G., **Porchetta, A.*** (co-corr. Author) Ricci, F. (2017). Allosteric DNA nanoswitches for controlled release of a molecular cargo triggered by biological inputs. **Chem. Sci.**, 8(2), 914-920.
21. Rossetti, M., Ippodrino, R., Marini, B., Palleschi, G., **Porchetta, A.*** (corr. author) (2018). Antibody-mediated small molecule detection using programmable DNA-switches. **Anal. Chem.**, 90(13), 8196-8201.
20. Bertucci, A.,* **Porchetta, A.*** (co-first author), Ricci, F. (2018). Antibody-templated assembly of an RNA mimic of the Green Fluorescent Protein **Anal. Chem.**, 90(2), 1049-1053.
19. **Porchetta, A.**, Ippodrino, R., Marini, B., Caruso, A., Caccuri F., Ricci F. (2018). Programmable nucleic acid nanoswitches for the rapid, single-step detection of antibodies in bodily fluids **J. Am. Chem. Soc.**, 140(3), 947-953.
18. Rossetti, M., **Porchetta, A.*** (corrisponding author) (2017) Allosterically Regulated DNA-based Switches: from Design to Bioanalytical Applications – A review **Anal. Chim. Acta**, 10.1016/j.aca.2017.12.046.
17. Ricci, F., Vallée-Bélisle, A., Simon, A., **Porchetta, A.**, Plaxco, K. (2016) Using Nature's "tricks" to rationally tune the binding properties of biomolecular receptors. **Acc. Chem. Res.**, 49,1884–1892.
16. **Porchetta A.**, Idili A., Vallée-Bélisle A., Ricci F. (2015) A general strategy to introduce pH-induced allostery in DNA-based receptors to achieve controlled release of ligands. **Nano Lett.**, 15, 4467–4471.
15. **Porchetta, A.**, Vallée-Bélisle, A., Plaxco, K.W., Ricci, F. (2012).

Using distal site mutations and allosteric inhibition to tune, extend and narrow the useful dynamic range of aptamer-based sensors.

J. Am. Chem. Soc., 134 (51), 20601-20604. (*Featured in JACS Spotlight article and in many scientific news media (sciencedaily, biosciencetechnology, etc.)*).

14. **Porchetta, A.**, Vallée-Bélisle, A., Plaxco, K.W., Ricci, F. (2013).
Allosterically Tunable, DNA-Based Switches Triggered by Heavy Metals.
J. Am. Chem. Soc., 135 (36), 13238–13241.
13. Idili, A., * **Porchetta, A.* (co-first author)**, Amodio, A., Vallée-Bélisle, A., Ricci, F. (2015)
Controlling hybridization chain reaction using pH.
Nano Lett., 15 (8), 5539–5544.
12. Amodio, A.*, Zhao, B.*, **Porchetta, A.* (co-first author)**, Idili, A.; Castronovo, M.; Fan, C.; Ricci, F. (2014)
Rational design of pH-controlled DNA strand displacement.
J. Am. Chem. Soc., 136 (47), 16469–16472.
11. Ricci, F., Vallée-Bélisle, A., **Porchetta, A.**, Plaxco, K.W. (2012)
The rational design of allosteric inhibitors and activators using the population-shift model: in vitro validation and application to an artificial biosensor
J. Am. Chem. Soc., 134, 15177-15180 .
10. Kang, D., Vallée-Bélisle, A., **Porchetta, A.**, Plaxco, K.W., Ricci, F. (2012)
Re-engineering electrochemical biosensors to narrow or extend their useful dynamic range.
Angew. Chem. Int. Ed., 51 (27), 6717-6721.
9. Rossetti, M., Ranallo, S., Idili, A., Palleschi, G., **Porchetta, A.* (co-corresponding author)**, Ricci, F.* (2017)
Allosteric DNA nanoswitches for controlled release of a molecular cargo triggered by biological inputs
Chem. Science, 8, 914-920. (*Featured in the Front Cover of Chem. Sci.*)
8. Del Grosso, E., Idili, A., **Porchetta A.**, Ricci, F. (2016)
A modular clamp-like mechanism to regulate the activity of nucleic-acid target-responsive nanoswitches with external activators.
Nanoscale, 2016, 8, 18057-18061. (*Featured in the Front Cover of Nanoscale*)
7. Ranallo, S., Amodio, A., Idili, A., **Porchetta, A.**, Ricci, F. (2016)
Electronic control of DNA-based nanoswitches and nanodevices.
Chem. Sci., 7, 66-71. (*Featured in the Front Cover of Chem. Science*)
6. Adornetto, G., **Porchetta, A.**, Palleschi, G., Plaxco, K.W., Ricci, F. (2015)
A general approach to the design of allosteric, transcription-factor-regulated DNAzymes.
Chem. Sci., 6, 3692-3696. (*Featured in the Front Cover of Chem. Science*)
5. Venanzi, M., Gatto, E., Caruso, M., **Porchetta, A.**, Formaggio, F., Toniolo, C. (2014)
Photoinduced Electron Transfer through Peptide-Based Self-Assembled Monolayers Chemisorbed on Gold Electrodes: Directing the Flow-in and Flow-out of Electrons through Peptide Helices.
J. Phys. Chem. A, 118 (33), 6674–6684.
4. Gatto, E., **Porchetta, A.**, Scarselli, M., De Crescenzi, M., Formaggio, F., Toniolo, C., Venanzi, M. (2012).
Playing with Peptides: How to Build a Supramolecular Peptide Nanostructure by Exploiting Helix-Helix Macrodipole Interactions.
Langmuir, 28 (5), 2817-2826.
3. Biagiotti, V., **Porchetta, A.**, Desiderati, S., Plaxco, K. W., Palleschi, G., Ricci, F. (2012).
Probe accessibility effects on the performance of electrochemical biosensors employing DNA monolayers.
Anal. and Bioanalytic. Chem., 402(1), 413-421.
2. Gatto, E., Caruso, M., Porchetta, A., Toniolo, C., Formaggio, F., Crisma, M., et al. (2011).
Photocurrent generation through peptide-based self-assembled monolayers on a gold surface: Antenna and junction effects.
Journ. of Pep. Science, 17(2), 124-131.

- Gatto, E., Porchetta, A., Stella, L., Guryanov, I., Formaggio, F., Toniolo, C., Kaptein, B., Broxterman, Q.B., Venanzi, M. (2008).
Conformational effects on the electron transfer efficiency in peptide foldamers based on α,α -disubstituted glyceryl residues.
Chem. Biodiv., 5, 1263-1278.

LECTURES AND INVITED TALKS

Oct 2025	Invited Speaker – 7th Functional DNA Nanotechnology Workshop
Jul 2025	Invited Speaker - International Symposium on Macromolecular Bioscience and Biomaterials (Frascati, IT)
Sep 2024	Invited Speaker - XIII International Symposium on Nano & Supramolecular Chemistry (Pula, IT)
Aug 2024	Invited Speaker - 75th Annual Meeting of the International Society of Electrochemistry (Montreal)
Nov 2022	Invited Talk at CNR - Institute of Biosciences and Bioresources (Napoli)
Oct 2022	Invited Speaker (Biosensor School) Trends in Nanotechnology International Conference (TNT2022)
Sep 2022	XXIX Congresso della Divisione di Chimica Analitica della Società Chimica Italiana (SCI)
Sep 2021	Key note - XXVIII Congresso della Divisione di Chimica Analitica della Società Chimica Italiana (SCI)
Aug 2018	7th EUChemES , Liverpool, UK (Invited Speaker , European Young Chemists Award Competition Sessions)
Sep 2017	Italian Chemistry Society General Conference, Paestum, Italy
June 2017	Future Trends in DNA-based Nanotechnology Conference, Dresden, Germany
Oct 2016	Devotes Conference (Final Conference UE funded projects), Bruxelles, Belgium
Sep 2016	6th EUChemS Chemistry Conference , Siviglia, Spain
Sep 2016	Italian Chemistry Society General Conference, Taormina, Italy (Invited Speaker)
May 2016	ALBNANO-Nanotechnology and biosensors, Tirana, Albany (Invited Speaker)
June 2016	6th European Conference on Chemistry in Life Science , Lisbon, Portugal
June 2016	2 th Functional DNA Nanotechnology 2014, Rome, Italy
Sep 2016	Italian Chemistry Society General Conference, Arcavacata, Italy
Sep 2015	Italian Analytical Chemistry Generale Conference, Sestri Levante, Italy
May 2015	Workshop 'Bioinspired-nanotechnology for Biosensing', Sitges, Spain
Dec 2015	Workshop 'Ageing on mind 2012', Tel Aviv, Israel
Sep 2015	Italian Analytical Chemistry Generale Conference, Isola d'Elba, Italy

ORGANIZATION OF SCIENTIFIC MEETINGS

Apr 2025	Organization Committee: Giornate di Bioanalitica 2025, Rome, Italy
Mar 2024	Organization Committee: Giornate di Bioanalitica 2024, Bologna, Italy
Mar 2023	Organization Committee: Giornate di Bioanalitica 2023, Florence, Italy
Jul 2016	Organization Committee: 2 th Functional DNA Nanotechnology 2016, Rome, Italy
Jul 2014	Organization Committee: 1 th Functional DNA Nanotechnology 2014, Rome, Italy

MEMBERSHIP OF SCIENTIFIC SOCIETIES

Sep 2022 - present	Board member of the divisional group "Bioanalytical Chemistry" (SCI)
Jan 2012 - present	Member of the Italian Chemical Society (SCI)