



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, DNA-based hybrid materials, Molecular switch

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

47 papers in ISI peer-reviewed journals

H-index: 26 (Scholar)

1,804 total citations (Scopus)

19 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

- 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.**, just accepted
- 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 Analytical Chemistry 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.** 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.
1. 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

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

ORGANIZATION OF SCIENTIFIC MEETINGS

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)

Autorizzo il trattamento dei miei dati personali ai sensi degli articoli 13 e 14 del Regolamento UE 2016/279.
Roma li, 24/10/2020