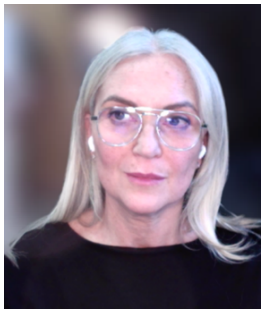
CURRICULUM VITAE OF LUISA TORSI

PERSONAL DATA



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EDUCATION

1994 – 1996 ***Post-Doctoral Fellow*** at Bell Laboratories - Lucent Technologies (formerly AT&T), Murray Hill – NJ (USA) – Supervisor: Prof. Ananth Dodabalapur

1988 – 1993 ***Ph.D. in Chemical Sciences*** at the Chemistry Department of the University of Bari A. Moro - Supervisor: Prof. Francesco Palmisano; the formal defense of the thesis was held at La Sapienza University on 09/22/1993 but the official document issued by the Ministry of Research is dated 10/20/1995

1989 ***Laurea Degree in Physics*** at the Physics Department of the University of Bari A. Moro - Supervisor: Prof. Aldo Cingolani

1983 ***Scientific high school diploma*** at the Liceo Scientifico "E. Fermi" Bari

PRESENT POSITION

2005 - today ***Full Professor of Chemistry*** at the Chemistry Department of the University of Bari A. Moro

FORMER POSITIONS

2017 - 2022 ***Adjunct Professor*** (10% of the time) at the *Faculty of Science and Engineering of Åbo Akademi University* (Finland) under the collaboration agreement signed between the University of Bari and Åbo Akademi University

1998 – 2004 ***Associate Professor of Chemistry*** at the Chemistry Department of the University of Bari A. Moro

1993 -1998 ***Assistant Professor of Chemistry*** at the Chemistry Department of the University of Bari A. Moro

07-2006 ***Visiting Professor*** at the Chemistry Department of the University Denis Diderot, Paris VII in France

06-2005 ***Visiting Professor*** at the Chemistry Department of the University of Angers in France

08-2000 ***Visiting researcher at Bell Laboratories*** - Lucent Technologies Murray Hill – NJ (USA)

SUMMARY OF THE CV

Luisa Torsi received her *Laurea* degree in Physics from the University of Bari in 1989 and a Ph.D. in Chemical Sciences from the same institution in 1993. She was a post-doctoral fellow at Bell Labs from 1994 to 1996. In 2005 and 2006 she was an invited professor at the University of Anger and Paris 7. Since the age of 40 she is a full professor of chemistry at the University of Bari and from 2017 to 2022, she was an adjunct professor at the Abo Academy University in Finland. Since 2023, she is fellows of the prestigious Accademia Nazionale dei Lincei. Presently, she is serving as vice-president of the Scientific Committee of the Italian National Research Council and as president of the board of directors of the Regional Agency for Technology, Technology Transfer, and Innovation.

In 2010 she has been awarded the Heinrich Emanuel Merck prize for analytical sciences, this marking the first time the award has been given to a woman. The IUPAC - International Union of Pure and Applied Chemistry awarded her with the 2019 Distinguished Women in Chemistry or Chemical Engineering. The analytical chemistry division of the European Chemical Society (EuChemS) conferred her the Robert Kellner Lecturer 2019. Prof. Luisa Torsi is also the winner of the Wilhelm Exner Medal 2021 with the following motivation: "*for her pioneering research in organic bioelectronics and for having successfully combined electronic and electrochemical sensors, analytical chemistry, organic semiconductors, solid-state device physics, and materials chemistry in an interdisciplinary manner".* The prize has been awarded since 1921 by the Austrian Industrial Association to celebrate excellence in science and the over 230 awardees include more than 20 Nobel prizes. The Italian President, Sergio Mattarella invited Prof. Torsi to the Quirinale in Rome to personally congratulate her on this award. In 2023, she was selected as the winner of the Premio Presidente della Repubblica, which has been awarded by the Accademia Nazionale dei Lincei since 1949. Among the recipients of this award, there have been several winners of other prestigious honours, including the Nobel Prize and the Wolf Prize. In 2025 the Faculty of Science and Engineering at Åbo Akademi University (FI) awarded her with a Honorary Doctorate. Torsi has been also elected 2017 Fellow of the Material Research Society, *for pioneering work in the field of organic (bio) electronic sensors and their use for point-of-care testing*. She is also Fellow of the Royal Society of Chemistry since 2022.

Torsi is the author more than 290 papers, published in journals such as Science, Nature Materials, Nature Reviews and Advanced Materials. Her works collected almost 20.000 Google Scholar (15.000 Scopus) citations resulting in an h-index of 70 (63 Scopus**).** According to ScholarGPS®, she ranks in the top 0.57% of the most cited scientists in Chemistry and in the top 0.4% across all disciplines worldwide. (https://scholargps.com/scholars/4706321976613 2/luisa-torsi)**.** She is also a co-inventor of 14 patents and has given over 200 invited seminars, including more than 60 plenary talks at conferences and universities in USA, Asia, and Europe.

Research funding amounts to nearly 40 M€, including several European, national, and regional projects, of which Torsi is often the coordinator. Right now, a key project is with the Apulian regional centre "Single-Molecule Digital-Assay" https://www.singlemolecule.center chaired by Torsi, where a clinical trial is ongoing to validate the Single-Molecule with a large Transistor (SiMoT) technology patented by the group led by Torsi in 2016. SiMoT technology, which is currently at a Technology-Readiness-Level of 5-6 (TRL5-6), is planned to reach TRL7-8 in a year and meet the needs of an ideal point-of-care device by combining the advantages of a salivary antigen test (fast, disposable, easy to use, non-invasive) with the performance of a molecular one (reliably sensitive to one single marker in a droplet - 0.1 ml - of a biological fluid). Torsi also coordinated the "Single-molecule bio-electronic smart system array for clinical testing – SiMBiT" (https://www.simbit-h2020.eu) European project that successfully brought the SiMoT proof-of-principle device published in 2018 to an all-electronic ELISA-like single-molecule array prototype for early and minimally invasive pancreatic cancer diagnosis. Another key project, BioScreen, financed by the Lombardia region, concerned the development of a SiMoT-based salivary single-sensor test, for single COVID-19 virion assay. Torsi is presently coordinating an Italian project financed by the Ministry of Agriculture in which a SiMoT

POC prototype is developed to assay a single live Xylella fastidiosa bacterium directly in infected olives trees' sap. She has also coordinated a "European Industrial Doctorate" Marie Curie project in collaboration with the German Multinational Merck and a Marie Curie "International Training Networks" to establish a European Network of electronic sensing. She has also participated as PI in a number of European projects and several national Italian projects funded by the Ministry of Research were also coordinated by prof. Torsi.

Since 2020 she has been appointed National Representative for the Marie Skłodowska-Curie Action (MSCA) of Horizon Europe by the Italian Minister for Education and Research. She is also a past president of the European Material Research Society (over 4.000 members), the first woman to serve in this role. From 2022 to 2024, she has been also the President of MEDISDIH *S.c.ar.l*., the evolution of the Apulian Mechatronics technology district strongly involved in promoting industrial product and process innovations that integrate the progress achieved by digital technologies in support of multidisciplinary mechatronic technologies also for health applications. Torsi has been also a member of the Board of Directors of the Leonardo Foundation – Civiltà delle Macchine, established by the Founding Member Leonardo SpA, to promote collaboration with stakeholders, communities, and territories.

Prof. Torsi is committed as a role model for female young scientists. She has been giving several talks including a TEDx talk. She is one of the 100Experts, a project led by Fondazione Bracco that aims to create an online database featuring the CVs of female experts in STEM, a sector historically underrepresented by women but strategic for the economic and social development. In a campaign to foster gender equality in science among children, prof. Torsi was featured in a story of TOPOLINO (Italian comic digest-size series of Disney comics), as "Louise Torduck", a successful female scientist of the Calisota valley.

RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

Scientific career path

Torsi is internationally recognized as a pioneer in the field of organic bioelectronic sensors (DOI: 10.1002/adma.202309705). This appreciation stems from one of the defining aspects of her scientific journey: the ability to bridge and integrate multiple interrelated disciplines, including bioelectronic (DOI: 10.1002/adma.202309705; 10.1038/s41578-025-00863-6), plasmonic (DOI: 10.1002/adma.202418610), electrochemical (DOI: 10.1007/BF00323981) and biochemical sensing (DOI: 0.1002/anie.201502615, 10.1073/pnas.1200549109) sensors, analytical chemistry (DOI: 10.1021/ac00223a016; 10.1146/annurev-anchem-061522-034729) organic semiconductors (DOI: 10.1002/adma.19960081021), solid-state device physics (DOI: 10.1126/science.268.5208.270) as well as material science(DOI: 10.1038/nmat2167).

The interdisciplinary approach was shaped early on by her academic path, which includes a *laurea* degree in Physics and a PhD in Chemistry, followed by a postdoc at Bell Laboratories in USA in a group including engineers, chemists and physicists. At the very beginning of her PhD, she contributed to seminal papers on amperometric electrochemical biosensors (DOI: 10.1007/BF00323981) based on conducting polymers. Building on this foundation, she independently developed the concept further, leading to the creation of electrochemical diodes (DOI: 10.1016/0039-6028(92)90261-4; 10.1002/adma.19950070418; 10.1039/FT9928803183). Despite having limited international experience at the time, these cross-disciplinary studies enabled her to secure a postdoctoral position at the renowned Bell Labs, where she deepened her expertise in organic devices through understanding the electronic properties of field-effect transistors (FETs)

based on organic semiconductors (DOI: 10.1126/science.268.5208.270; 10.1126/science.269.5230.1560).

The vision of integrating organic electronic devices with biosensing fully materialized upon her return to Italy, where she launched her independent research career. Here, she pioneered the use of organic transistors for chemical sensing, successfully validating the concept in a series of publications that demonstrated how the two-dimensional charge transport of FETs could be harnessed for highly sensitive detection (DOI: 10.1016/S0925-4005(00)00541-4; 10.1063/1.1360785). Although the sensitivity and limit of detection (LOD) achieved in this work represented a significant advance in chiral differential sensing, the approach was critically limited by this device inability to reliably detect non-chiral biological targets, which are abundant in real biofluids. To address this, she shifted her focus toward improving selectivity by integrating biological recognition elements, especially antibodies at the time, directly into the FET architecture DOI: 10.1002/adma.201203587; 10.1021/ac302702n). In parallel, she realized that maintaining the physiological environment of bio-species was crucial for reliable detection, which led me to adopt electrolyte-gated FETs (DOI: 10.1038/s43586-021-00065-8) as a more suitable platform as compared to bottom gate FETs operated in air. This approach opened to functionalizing the gate with antibodies or proteins (DOI: 10.1038/ncomms7010; 10.1016/j.bios.2017.12.041; EP4553501A2; US2019331673A1) ushering in research focused on bioelectronic interfaces endowed with high specificity and biocompatibility.

This progression ultimately enabled the demonstration of a highly selective single-molecule detection on a millimeter-scale bioelectronic interface biofunctionalized with trillions of capturing antibodies or probes (DOI: 10.1038/s41467-018-05235-z; 10.1038/d41586-018-05950-z; EP3418729A1). This is a major advance over traditional single-molecule techniques, as it provided not only affinity binding at molecular resolution but also, for the first time, single-molecule LOD in 0.1 mL, namely at 10^{-20} M. Building on this foundation, the Torsi's group with collaborators has been now moving toward real-world applications, implementing portable bioelectronic devices capable of detecting SARS-CoV-2 (DOI: 10.1126/sciadv.abo0881; 10.1038/d43978-022-00092-3), pancreatic cancer precursors biomarkers (DOI: doi.org/10.1002/adma.202304102; 10.1002/aelm.202100304; 10.1002/advs.202308141; 10.1016/j.gastha.2025.100790) and the Xylella bacterium (DOI: 10.1002/advs.202203900) directly in complex real biofluids. The technology is called *Single-Molecule with a Large Transistor* (SiMoT) which enables integrated immunometric and molecular bioelectric qualitative (Yes/No) assays with handheld and point-of-care devices with the performance level of a lab-scale molecular assays. Within the activities of an Innovation Centre (https://www.singlemolecule.center) she chairs, SiMoT single sensor device, is currently being tested in clinics within a clinical trial. However, SiMoT main limitation lies in its scalability into a large array, which is essential for digital quantification. In the development of bioelectronic arrays we faced severe challenges in expanding beyond 10^2–10^3 elements, as they require custom architectures, complex readout systems, and costly ASIC/FPGA circuits.

While working at the technological advancement of SiMoT, has now also devoted considerable effort to understanding the fundamental mechanisms that enable single-molecule detections across an interface that is 10^{12} times larger than the target itself (DOI: 10.1021/acs.chemrev.1c00290). It became evident that the electronic amplification provided by a FET alone could not fully account for the remarkable improvement in the LOD (DOI: 10.1021/acs.chemrev.1c00290; 10.1039/C9MH01544B). A significant breakthrough came with the demonstration that single-molecule detection over a large-area interface is triggered by a pH-conditioning and can be also achievable through plasmonic detection (DOI: 10.1002/adma.202418610; DOI: 10.1038/s41578-025-00863-6). This opened the field to SinGle Molecule at a Large surface (SiMoLS) This finding opened an entirely new perspective on the role of biomaterials cooperative dipole networks in enabling an amplification process that allow ultra-sensitive assays, with far-reaching implications for the future of biosensing.

Detailed accomplishments / contributions

Prof. Luisa Torsi has made a series of pioneering and sustained contributions that have fundamentally advanced the fields of organic electronics, bioelectronic sensing, and single-molecule diagnostics, combining deep physical insight with science and engineering leadership and system-level innovation.

a) Her early work laid the foundations of organic bioelectronic sensing through the development of organic field-effect transistors (OFETs) capable of *enantioselective detection*. These devices were the first to discriminate between molecular mirror twins at parts-per-million concentrations, achieving sensitivities three orders of magnitude beyond the state of the art at the time. This breakthrough demonstrated that organic electronic devices could perform chemically selective, ultra-sensitive detection rather than serving merely as passive transducers, thereby opening a new paradigm in molecular sensing (DOI: 10.1038/nmat2167).

b) This achievement built directly upon Prof. Torsi's earlier seminal contributions to the physics of organic semiconductors, where she helped establish fundamental two-dimensional charge transport mechanisms in organic transistor architectures. Her work provided some of the earliest experimental demonstrations that charge transport in organic semiconductors could be described using a coherent 2D framework, thereby bridging organic electronics with solid-state physics and enabling predictive device engineering (DOI: 10.1126/science.269.5230.1560; DOI: 10.1126/science.268.5208.270).

c) Leveraging these foundational advances, over the past decade Prof. Torsi has led and coordinated the development of a transformative diagnostic platform known as SiMoT (Single-Molecule with a Large Transistor). SiMoT integrates a disposable sensing cartridge with a handheld electronic reader, merging the affordability, simplicity, and accessibility of antigen tests with the ultra-sensitivity typically associated with centralized molecular diagnostics. The platform can detect individual antigens or nucleic acid markers directly in raw biofluids - including saliva and plasma - without any need for sample preparation, purification, or amplification. SiMoT delivers results within approximately 20 minutes, achieving diagnostic accuracies exceeding 96% and false positive/negative rates below 4%. A defining feature of the technology is its ability to detect *both proteins and nucleic acids using the same device architecture*, setting it apart from conventional point-of-care (POC) diagnostics. Designed for deployment across diverse environments - including homes, pharmacies, and remote or resource-limited clinics - SiMoT combines single-molecule sensitivity, high reliability, wireless connectivity, and exceptional ease of use (DOI: 10.1038/s41467-018-05235-z; DOI: 10.1126/sciadv.abo0881; DOI: 10.1002/advs.202203900).

d) Torsi further extended the SiMoT concept by demonstrating its compatibility with optical single-molecule detection. This hybrid platform, termed SiMoLS (Single-Molecule with a Large Surface**)**, couples SiMoT cooperative amplification mechanism with surface plasmon resonance (SPR) immunometric assays. This approach extends the sensitivity of SPR-based detection from the picomolar regime down to the zeptomolar range (10^{-20} M), corresponding to an unprecedented improvement of eleven orders of magnitude relative to the state of the art. This result establishes a general strategy for overcoming the fundamental sensitivity limits of surface-based biosensors (DOI: 10.1002/adma.202418610).

e) The pH conditioning enables the emergence of two distinct sensing regimes in large-area SPR and bioelectronic immunoassays by fundamentally altering the physical state of the capturing biolayer. This is now demonstrated by prof. Torsi's studies to be a general feature that can be seen in a hundred published papers as recently highlighted in a perspective paper (DOI: 10.1038/s41578-025-00863-6). At high analyte concentrations, the system operates in a conventional ensemble regime, where binding events are numerous, independent, and well described by Maxwell–Boltzmann statistics and standard affinity-binding equilibria. In this regime, the SPR or bioelectronic signal reflects the average change associated with the formation of a layer building on top of the biological recognition one and follows classical saturation behavior. In contrast, at ultralow analyte concentrations, pH conditioning drives the biolayer into a metastable, highly responsive state in

which individual binding events occur on a densely packed landscape of recognition elements. Under these conditions, sensing is governed by Poisson statistics, as the number of target molecules in the sampled volume is zero, one, or a few. Remarkably, a single affinity binding event can trigger a cooperative, self-propagating rearrangement of dipoles and dielectric properties across a large population of neighboring receptors. This collective amplification effect, likely mediated by hydrogen-bonding networks within the capturing layer and by hydrophobic and electrostatic interactions among closely packed proteins, extends the impact of a single molecular recognition event over millions of receptors. As a result, a macroscopic signal becomes detectable even when only one or a few target molecules are present. The transition between these two regimes is therefore not merely concentration-dependent but is enabled by pH conditioning, which unlocks cooperative effects that bridge molecular-scale events and large-area optical transduction.

Impact of the work

The impact of Prof. Torsi's work spans fundamental science, applied engineering, and translational diagnostics.

a)–b) Her early and foundational contributions to organic transistors and organic bioelectronic sensors are widely regarded as seminal. They have shaped the evolution of organic electronics and plasmonic from exploratory materials research into a mature and predictive field with real-world sensing applications. The originality, depth, and long-term influence of this work are reflected in its broad adoption by the international community and in the numerous prestigious awards conferred upon Prof. Torsi.

c) The SiMoT platform represents a paradigm shift in diagnostic technology. It enables ultra-sensitive detection of a broad spectrum of biomarkers from as little as 0.1 mL of raw sample, including saliva, serum, pancreatic cyst fluid, olive sap, and whole blood (DOI: 10.1002/aelm.202100304). SiMoT has been successfully applied to the detection of proteins, antigens, microRNAs, and entire pathogens such as SARS-CoV-2 and Xylella fastidiosa. With limits of quantification as low as 10^{-20} M - corresponding to a single molecule per droplet—the platform achieves false positive and false negative rates below 1% (DOI: 10.1038/s41467-018-05235-z; DOI: 10.1126/sciadv.abo0881; DOI: 10.1002/advs.202203900). Its binary YES/NO readout has been validated across more than 300 assays, including over 100 patient-derived samples (DOI: 10.1002/adma.202304102). Specifically engineered for POC deployment, SiMoT delivers results in under one hour without reliance on laboratory infrastructure (DOI: 10.1002/adma.202309705). Crucially, the SiMoT/SiMoLS amplification mechanism - based on cooperative conformational transitions - circumvents diffusion-limited detection constraints inherent to nanoscale biosensors, enabling robust and reproducible single-molecule detection (DOI: 10.1002/advs.202104381; DOI: 10.1002/adma.202418610). The translational and societal impact of SiMoT technology is evidenced by the establishment of the Apulian Regional Center "Single-Molecule Digital Assay" (https://www.singlemolecule.center/), founded in 2022 with support from the regional government. The center plays a strategic role in advancing SiMoT from pre-clinical validation (TRL 5) toward near-commercial readiness (TRL 7–8). A second-generation prototype - now at TRL 6 and scarcely larger than a USB stick—is currently undergoing clinical testing. A large-scale decentralized clinical trial, comprises 1,500 tests and aims to validate key performance metrics, including single-molecule LOD/LOQ in 0.1 mL of raw samples, error rates below 5%, and analysis times under one hour. The trial is conducted in collaboration with the Apulian Government and the Scientific Oncological Institute of Bari. Further evidence of impact includes over 45 peer-reviewed publications related to SiMoT (cumulative impact factor exceeding 500), seven competitively funded research projects totaling more than €10 million, and five international patent families (PCT/IB2023/053542; PCT/IB2019/061345; PCT/IB2017/058065; PCT/IB2018/050491; WO2018234905), collectively demonstrating both scientific leadership and strong translational potential.

MOST RELEVANT PUBLICATIONS

The research activity is documented by more than 290 papers, published in journals such as Science, Nature Materials and Advanced Materials. Her works collected almost 20.000 Google Scholar (almost 15.000 Scopus) citations resulting in an h-index of 70 (63 Scopus). Furthermore, the works cited at least 10 times (i10-index) are more than 180 (Google Scholar)
https://scholar.google.it/citations?hl=it&tzom=-60&user=4vNWapMAAAAJ

https://www.scopus.com/authid/detail.uri?authorId=7005294241

Listed in the following are the most relevant publications:

1. Macchia, E. and Torsi, L.* *Sensing regimes in potentiometric immunoassays.* **Nature Reviews Materials (IF=87.2)** 2025, DOI: 10.1038/s41578-025-00863-6
2. Macchia, E., Di Franco, C., Scandurra, C., Sarcina. L., Piscitelli, M., Catacchio, M., Caputo, M., Bollella, P., Scamarcio, G.*, Torsi, L.* *Photonic single-affinity detections at 10^{-20} molar.* **Advanced Materials (IF=29.4)** 2025, DOI: 10.1002/adma.202418610
3. Scandurra, C., Björkström, K., Caputo, M., Sarcina, L., Genco, E., Modena, F., Viola, FA., Brunetti, C., Kovács-Vajna, Z.M., Di Franco, C., Haeberle, L., Larizza, P., Mancini, M.T., Österbacka, R., Reeves, W., Scamarcio, G., Wheeler, M., Caironi, M.*, Cantatore, E.*, Torricelli, F.*, Esposito, I.*, Macchia, E.*, Torsi, L.* *Analysis of Clinical Samples of Pancreatic Cyst's Lesions with A Multi-Analyte Bioelectronic SiMoT.* **Advanced Science (IF=15.1)** 2024, 202308141, DOI: 10.1002/advs.202308141
4. Macchia, E., Torricelli, F., Caputo, M., Sarcina, L., Scandurra, C., Bollella, P., Catacchio, M., Piscitelli, M., Di Franco, C., Scamarcio, G., Torsi, L.* *Point-Of-Care Ultra-Portable Single-Molecule Bioassays for One-Health*. **Advanced Materials (IF=29.4)** 2023, 202309705, DOI: 10.1002/adma.202309705. ***Part of the "Hall of Fame collection" and featured as frontispiece of the issue***
5. Di Franco, C.*, Piscitelli, M., Macchia, E., Scandurra, C., Catacchio, M., Torsi, L.*, Scamarcio, G.* *Kelvin probe force microscopy on patterned large-area biofunctionalized surfaces: a reliable ultrasensitive platform for biomarker detection*. **Journal of Materials Chemistry C (IF=6.4)** 2023, vol. 12, pag. 73-79 DOI: 10.1039/d3tc03110a
6. Genco, E., Modena, F., Sarcina, L., Björkström, K., Brunetti, C., Caironi, M., Caputo, M., Demartis, V.M., Di Franco, C., Frusconi, G., Haeberle, L., Larizza, P., Mancini, M.T., Österbacka, R., Reeves, W., Scamarcio, G., Scandurra, C., Wheeler, M., Cantatore, E.* Irene Esposito, I.* Macchia, E.* Torricelli, F.* Viola, A.F.* Torsi, L.* *A Single-Molecule Bioelectronic Portable Array for Early Diagnosis of Pancreatic Cancer Precursors*. **Advanced Materials (IF=29.4)** 2023, 202304102, DOI: 10.1002/adma.202304102. ***Featured as frontispiece of the issue***
7. Scandurra,C., Kim Björkström, K., Sarcina, L., Imbriano, A., Di Franco, C., Österbacka, R., Bolella, P., Scamarcio, G., Torsi, L.,* Macchia, E.,* *Single Molecule with a Large Transistor – SiMoT cytokine IL-6 Detection Benchmarked against a Chemiluminescent Ultrasensitive Immunoassay Array*, **Advanced Materials Technologies (IF= 6.8)** 2023, 202201910, DOI: 10.1002/admt.202201910
8. Di Franco, C., Macchia, E., Sarcina, L., Ditaranto, N., Khaliq, A., Torsi, L.,* Scamarcio, G.* *Extended Work Function Shift of Large-Area Biofunctionalized Surfaces Triggered by a Few Single-Molecule Affinity Binding Events*. **Advanced Materials Interface (IF=5.4),** 2022, 202201829; DOI: 10.1002/admi.202201829
9. Sarcina, L.; Macchia, E;* Loconsole, G.; D'Attoma, G.; Bollella, P.; Catacchio M.; Leonetti, F.; Di Franco, C.; Elicio, V.; Scamarcio, G.; Palazzo, G.; Boscia, D.; Saldarelli, S.; and Torsi, L.* *Fast and Reliable Electronic Assay of a Xylella fastidiosa Single Bacterium in Infected Plants*

Sap. **Advanced Science (IF= 15.1)** 2022, 2203900 DOI: 10.1002/advs.202203900. ***Featured as main covered***

10. Macchia, E., Kovacs-Vajna, Z.M., Loconsole, D., Sarcina, L., Redolfi, M., Chironna, M., Torricelli, F.,* Torsi, L.,* *A handheld intelligent single-molecule binary bioelectronic system for fast and reliable immunometric point-of-care testing*. **Science Advances (IF= 13.6)** 6 Jul 2022 Vol 8, Issue 27 DOI: 10.1126/sciadv.abo0881. ***Highlighted in Nature****:* *https://www.nature.com/articles/d43978-022-00092-3*
11. Macchia, E; Torricelli, F.; Bollella, P.; Sarcina, L.; Tricase, A.; Di Franco, C.; Österbacka, R.; Kovács-Vajna, Z.M.; Scamarcio, G.; Torsi, L.*; *Large-Area Interfaces for Single-Molecule Label-free Bioelectronic Detection.* **Chemical Reviews (IF= 62.1)** 2022,122, 4, 4636 DOI: 10.1021/acs.chemrev.1c00290
12. Macchia, E., De Caro, L., Torricelli, F., Di Franco, C., Mangiatordi, G.F., Scamarcio, G., and Torsi, L.*, *Why a diffusing single-molecule can be detected in few minutes by a large capturing bioelectronic interface*. **Advanced Science (IF= 15.1)** 2022, vol. 9, n. 210438; DOI: 10.1002/advs.202104381
13. Torricelli, F.*, Adrahtas, D.Z., Bao, Z., Berggren, M., Biscarini, F., Bonfiglio, A., Bortolotti, C.A., Frisbie, C.F., Macchia, E., Malliaras, G.G., McCulloch, I., Moser, M., Nguyen, T.-Q., Owens, R., Salleo, A., Spanu, A., Torsi, L.* *Electrolyte-gated transistors for enhanced performance bioelectronics.* **Nature Reviews Methods Primers (IF= 39.8)** 2021, 1 Article number: 66, DOI: 10.1038/s43586-021-00065-8
14. Macchia E., Sarcina L., Driescher C., Gounani Z., Tewari A., Osterbacka R., Palazzo G., Tricase A., Vajna Z.M.K., Viol, F., Modena F., Caironi M.,Torricelli F., Esposito I.*, Torsi, L.*, *Single-Molecule Bioelectronic Label-Free Assay of both Protein and Genomic Markers of Pancreatic Mucinous Cysts' in Whole Blood Serum*, **Advanced Electronic Materials (IF=6.2)** 2021, 2199-160X, 2100304; DOI: 10.1002/aelm.202100304
15. Picca, M.R., Manoli, K., Macchia, E., Sarcina, L., Di Franco, C., Cioffi, N., Blasi, D., Österbacka, R., Torricelli, F., Scamarcio, G., Torsi, L.*, *Ultimately sensitive organic bioelectronic transistor sensors by materials and device structures design.* **Advanced Functional Materials (IF=19)** 2020, 30, art. No. 1904513, DOI: 10.1002/adfm.201904513
16. Macchia E., Picca R.A., Manoli, K., Di Franco, C., Blasi, B., Sarcina, L., Ditaranto, N., Cioffi, N., Österbacka, R., Scamarcio, G., Torricelli, F., Torsi, L.*, *About the amplification factors in organic bioelectronic sensors.* **Materials Horizons (IF=13.3)** 2020, vol. 7, pag. 999 DOI: 10.1039/C9MH01544B
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PATENTS

Patents pending:

No. 1 - Torsi L., Macchia E., Scamarcio G., Di Franco C., A method for optical, label-free detection of molecules at ultra-low concentration, particularly as low as zeptomolar concentration. 2023 PCT/IB2023/053542 on 06.04.23.

No. 2 - Torricelli, F, Torsi, L, Scamarcio, G, Kovacs-Vajana, Z.M., A clustered FET bio-sensor system for biological assay. A matrix of electronic and bioelectronic components made by a top plate and a bottom plate coupled together. The system likely aims to enhance the efficiency and sensitivity of biological assays through the utilization of clustered FET sensors. These sensors may offer advantages such as improved detection capabilities and potentially faster analysis of biological samples. 2019 PCT/IB2019/061345 on 24.12.2019.

No. 3 - Torsi L., Scamarcio G., Macchia E., Manoli K., Palazzo G., Cioffi N., Picca R. A. Sensor useful for providing field effect transistor sensor, comprises source-drain channel, semiconductor layer on source-drain channel, first gate electrode, first well, semiconductor layer and first gate electrode. Patent Number: WO2019145755-A1. Patent Assignee Name and Code: Univ Bari Aldo Moro (UYBA-Non-standard). 2019 Derwent Primary Ac-cession Number: 2019-67550N**.**

No. 5 - Torsi, L., Palazzo, G., Scamarcio, G., "A field-effect transistor sensor" European Patent Application 2017 no. 17177349.2 filed on June 22, 2017.

No. 6 - Torsi, L, Palazzo, G., Scamarcio, G., "Method of functionalization of a gate electrode of a field-effect transistor sensor" International 2017 Patent no. PCT/IB2017/058065 filed December 18, 2017.

Patents granted:

No. 6 - Torsi, L, Palazzo, G., Scamarcio, G., "Method of functionalization of a gate electrode of a field-effect transistor sensor" European Patent Application no. 16207596.4 filed December 30, 2016.

No. 4 - Torsi L., Palazzo G., Scamarcio, G., FET sensor *e.g.* biosensor for detecting biomarkers at the earliest possible stage of disease, has gate electrode that is functionalized with biological recognition elements layer patterned into several uncoupled domains. Patent Number(s): EP3418729-A1 WO2018234905-A1, 2018 Patent Assignee Name(s) and Code(s): Univ Bari Aldo Moro (UYBA-Non-standard). Derwent Primary Accession Number: 2018-A39981.

n. 7 - F. Babudri, G.M. Farinola, H.O: Hassan, F. Naso, F. Palmisano, M. C. Tanese, L. Torsi*, L. Valli, P. G. Zambonin; Organic thin film transistors comprising thienyl oligomers and their use as gaseous phase sensors. FT/TS/GV/ds/06578D53 (07.02.07) – International extension No. WO 2008/096239 – European Patent No. 2121647.

n. 8 - Angione, M. D.; Cioffi, N.; Magliulo, M.; Palazzo, G.; Torsi, L.; Cotrone, S.; Scamarcio, G.; Sabbatini, L.; Mallardi, Organic field effect transistors based on multilayers of self-assembled biological systems covered by an organic semiconductor layer: processes for their realization and use as sensors. EP2385563-A1

n. 9 - Angione, M. D.; Cioffi, N.; Magliulo, M.; Palazzo, G.; Torsi, L.; Cotrone, S.; Scamarcio, G.; Sabbatini, L.; Mallardi, A. Transistor e.g. FET, useful in sensor, comprises a conductive layer, a dielectric layer, and a semiconducting film that is deposited on top of receptor molecule layer previously deposited or covalently linked to surface of gate dielectric. Patent Number: WO2013065073-A1; WO2013065073-A8; US2014312879-A1

n. 10 - Cioffi, N.; Ditaranto, N.; Sabbatini, L.; Tantillo, G.; Torsi, L.; Zambonin, P. G. New nanoparticles comprising a core formed from metal selected from silver, copper, tin and zinc and a shell formed of quaternary ammonium compound, useful in nanocomposite materials and as biostatic compounds or biocides. Patent number: EP2157211-A1.

n. 11 - Cioffi, N.; Ditaranto, N.; Sabbatini, L.; Torsi, L.; Zambonin, P. G. Use of nano-particles in a fabric or polymer matrix for delaying the release speed of metal ions from the core into an aqueous material. Patent number: EP2123797-A1.

n. 12 - Ananth Dodabalapur, Howard E. Katz, Luisa Torsi, Lucent Technologies Inc., Murray Hill, NJ. Article comprising a thin film transistor with low conductivity organic layer United State Patent US005574291A; Patent Number: 5,574,291; Date of Patent: Nov. 12, 1996.

n. 13 - Ananth Dodabalapur, Howard E. Katz, Luisa Torsi, Lucent Technologies Inc., Murray Hill, NJ. Article comprising an organic thin film transistor. United States Patent US005596208A; Patent Number: 5,596,208; Date of Patent: Jan. 21, 1997.

n. 14 - Ananth Dodabalapur, Robert Cort Huddon, Howard E. Katz, Luisa Torsi, Lucent Technologies Inc., Murray Hill, NJ. Article comprising an organic thin film transistor adapted for biasing to form a n-type or a p-type transistor. United States Patent US006278127B1; Patent Number: US 6,278,127 B1; Date of Patent: Au .21, 2001.

MAIN AWARDS AND RECOGNITIONS

2025 ***Honorary Doctorate*** from Faculty of Science and Engineering -Åbo Akademi University (FI) https://www.abo.fi/en/about-abo-akademi-university/academic-traditions/conferral-ceremony/doctoral-conferral-ceremony-2025/conferral-ceremony-2025-honorary-doctors-and-jubilee-doctors/

2024 ***Fellow of the European Academy of Science:*** https://www.eurasc.eu/members/luisa-torsi/member/

2024 ***Lifetime Achievement Award*** - Executive Council of the Analytical Chemistry Division of the Italian Chemical Society, based on the proposal of the Committee of Experts who reviewed the applications received, with the following motivation: "For pioneering and innovative contributions in the field of electrochemical biosensors, for the significant impact of your scientific production, and for your mentorship activities in a prestigious school of Analytical Chemistry." https://www.soc.chim.it/it/divisioni/analitica/medaglie_premi_2024

2024 ***Melvin Jones Fellow*** by Lions District 108AB - Puglia and Lions Clubs International Foundation

2023 ***Spiers Memorial Lecture*** - Challenges and prospects in organic photonics and electronics, a Faraday Discussion, Royal Society of Chemistry https://www.rsc.org/events/detail/75379/challenges-and-prospects-in-organic-photonics-and-electronics-faraday-discussion

2023 ***Featured in Advanced Materials Hall of Fame*** https://onlinelibrary.wiley.com/doi/toc/10.1002/(ISSN)1521-4095.HallofFame

2023 ***Fellow of the Accademia Nazionale dei Lincei*** https://www.lincei.it/it/content/torsi-luisa

2023 ***Premio Presidente della Repubblica awarded by the Accademia dei Lincei***, an Italian prize introduced in 1949 by the former president and academic Luigi Einaudi. Among the people awarded, there are several winners of other important awards such as the Nobel Prize and the Wolf Prize. https://www.lincei.it/en/node/10282

2023 ***Recognition of the municipal administration of Bari*** to Professor Torsi for having brought prestige to the city through her work in the scientific, academic, and social fields https://www.comune.bari.it/-/oggi-a-palazzo-di-citta-la-consegna-di-un-riconoscimento-alla-professoressa-luisa-torsi.

2023 ***Marco Mascini Award*** of the Interdivisional Group 'Sensors' of the Italian Chemical Society

2022 ***Fellow of Royal Society of Chemistry*** for significant contributions to the publication of papers in the field of chemical sciences.

2021 ***Wilhelm Exner Medal 2021*** awarded for her pioneering contributions in the field of organic bioelectronics. The medal has been awarded since 1921 by the Austrian Association of Small and Medium Enterprises to celebrate excellence in research and science and is conferred in the presence of the Minister for Technological Innovation Leonore Gewessler under the aegis of the Austrian President Alexander Van der Bellen. The motivation is the following: Prof. Torsi's research crosswise combines electronic and electrochemical sensors, analytical chemistry, organic semiconductors, physics of solid-state devices, chemistry of materials and physics. Being at the forefront of one of the fastest growing research directions in organic electronics, her discoveries promise new technologies for healthcare and human well-being. The award has previously been conferred to 23 Nobel laureates, including scientists of the caliber of Guglielmo Marconi, William Shockley, Karl Ziegler, Ted Hänsch and Emmanuelle Charpentier https://www.wilhelmexner.org/en/. The Italian President Sergio Mattarella has invited Prof. Torsi to the Quirinale to personally congratulate her on this award.

2020 ***Canneri Medal*** awarded by the Analytical Chemistry Division of the Italian Chemical Society to distinguished scientists in the field of Analytical Chemistry https://www.soc.chim.it/it/divisioni/analitica/medaglie_premi_2020.

2019 ***Robert Kellner Lecture*** of the European Chemical Society Division of Analytical Chemistry honoring those who have made a substantial contribution to the advancement of research or teaching in analytical chemistry https://www.euchems.eu/divisions/analytical-chemistry/honours/ https://link.springer.com/article/10.1007/s00216-019-02373-1

2019 ***Outstanding Women of Southern Italy*** – Department for International Trade – UK Government Science and Innovation Network https://twitter.com/tradegovukITA/status/1104049783617044480/photo/2

2019 ***IUPAC (international Union for Pure and Applied Chemistry) Distinguished Women in chemistry or chemical engineering;*** the award recognizes and promotes the work of women in chemistry around the world. Winners are selected based on excellence in basic or applied

research, for achievements in teaching or education as well as for demonstrating leadership or managerial excellence in the chemical sciences. https://iupac.org/iupac-2019-distinguished-women.

2018 ***Plenary Lecture*** in the occasion of the inauguration of the academic year at the Department of Chemistry of the University of Turin https://www.unito.it/eventi/il-dipartimento-di-chimica-dedica-linaugurazione-dellaa-2018-2019-al-tema-del-crescente-ruolo .

2018 ***Silver medal of the Italian Chemical Society*** awarded to the Merck & Elsevier Young Chemistry Symposium by the "SCI Gruppo Giovani".

2017 Elected ***Fellow of the Material Research Society*** for pioneering work in bio-organic electronic sensors and their use in point-of-care testing https://www.mrs.org/careers-advancement/awards/spring-awards/mrs-fellows/list-of-mrs-fellows

2015 ***Overall platinum International European Women Inventors & Innovators Network Award*** for the biomedical devices she is developing. https://www.itwiin.org/en/albo/hall-of-fame-2013.html

2010 ***Heinrich Emanuel Merck Award*** conferred by the renowned pharmaceutical multinational that celebrates scientists who are developing innovative analytical chemistry methods with applications that aim to improve the quality of life. She was the first woman to win this award https://www.merckgroup.com/en/research/grants-and-awards/heinrich-emanuel-merck-award.html

SELECTION OF MOST RELEVANT PLENARY AND INVITED LECTURES

Prof. Torsi has delivered more than 200 invited seminars and nearly 50 plenary reports and invited lectures at universities and research centers in the USA, Asia and Europe. In the following some selected plenary and invited talks are listed:

Plenary and Key-note Lectures: IEEE 3M-NANO 2025 ChangChun, Ciana (2025); IUPAC-2025 Malaysia (2025); Opening ceremony of the Academic Year 2024/25 of the Scuola Normale Superiore di Pisa; Swiss@ePrint, Swizerland (2024); Symposium for YouNg Chemists (SYNC2024) in Rome; IEEE Biosensors 2024 in Cambridge; International Conference on Materials Science and Nanotechnology for Sustainable Applications (ICMSNSA), India (2023, on line); International Meeting on Chemical Sensors, Changchun, China (2023, on line); 9th IEEE International Workshop on Advances in Sensors and Interfaces, IWASI Monopoli, Italy (2023); CPE Keynote Seminar at Imperial College London (2022); Advances in Surface Interfaces and Interphases (2022, on line), LOPEC - Driving the Future of Printed Electronics, Munich (2022); Corso di Orientamento della Scuola Normale superiore di Pisa (2022), Brazilian Materials Research Society, Foz do Iguaçu (2021); Biosensors 2020, Buson (2021); IEEE Nanotechnology Material and Device Conference, Stockholm (2019); Euroanalysis XX – European Chemical Society, Istanbul (2019); Inaugurazione anno accademico 208/2019 Dipartimento di Chimica – Università degli Studi di Torino (2018); 14th International Symposium on Functional π-electron System, Berlin (2019); 2nd European Biosensor Symposium, Firenze (2019); Merck & Elsevier Young Chemistry Symposium by the "SCI Gruppo Giovani"; International Conference on Molecular Electronics, ElecMol'18 Paris, (2018); Polymer and Organic Materials for Electronics and Photonics: Science for Applications, Prague (2017); 12th International Symposium on Functional π-electron System, University of Washington in Seattle – USA (2015); 8th International Conference on Molecular Electronics and Bioelectronics (M&BE8) Tokyo, Japan (2015); 4th Zing Electrochemistry Conference – Portugal (2015); 8th ECNP International Conference on Nanostructured Polymers and Nanocomposites, Dresda (2014); Organic Photonics + Electronics Symposium Plenary Session at the SPIE Optics + Photonics Annual Meeting, San Diego (2014); Spanish Society for Analytical Chemistry XVIII Meeting (2013); Euroanalysis XVI "challenges in modern

analytical chemistry"– Belgrade (2011); 6th conference on Analytical Sciences – Dublin (2011); 30th, CAS International Semiconductor Conference – Sinaia (2007).

Invited Lectures to universities, research centers and companies (selection): College of Medicine, Drexel University Philadelphia (USA), Barcelona Insitute of Scienec and Tecnology (BIST), École polytechnique fédérale de Lausanne (EPFL); Scuola Normale Superiore, Pisa (Italy); E. Fermi Colloquia – European Laboratory for Non-linear Spectroscopy (LENS), Florence Italy; Institute of Hydrochemistry – Technical University of Munich; University of Groningen – The Physics Colloquium; Frontiers of Chemistry – Seminars – Headquarters of the Merck Group, Merck KgaA, Darmstad. Microelectronics Research Center – University of Texas at Austin; CNR-Istituto delle Macromolecole (I); Department of Chemistry – University of California; University of Cambridge CAPE-CIKC Advanced Technology Lectures; School of Materials Engineering – Nanyang Technological University; Institute of Material Research and Engineering, A*Star- Singapore; ITODYS-Paris VII; CNR-Istituto di Spettroscopia Molecolare (I); CNR-Istituto Lamel; Dipartimento di Chimica Inorganica-Università di Padova; Institut des Sciences et Technologies Moléculaires d'Angers; Dipartimento di Chimica – Università di Pisa; Annual Doctoral Workshop, Chemistry Department of the Universitat Autònoma de Barcelona.

LIST OF AWARDED PROJECTS

The projects awarded to Prof. Torsi and the consortia she often coordinates, have gathered almost 40 million euros (40 M€) in the last 16 years, and include several European, national, and regional contracts as detailed in the following:

On-going projects:

1**.- 2023 - "Assessing the need for terminology, standards and guidelines for wearable devices that provide chemical / biochemical measurement readouts"** – IUPAC The Analytical Chemistry Division (Div V) – **5, 000 $**

2. - **2022 - "Apulian-EDIH – Digital Innovation Hub"** – Submitted to the Digital Europe Program call DI-GITAL-2021-EDIH-INITIAL-01 — Initial Network of European Digital Innovation Hubs – application submitted by the Regional Mechatronic District and Digital Innovation Hub of Puglia S.c.a.r.l. – **Prof. Torsi is the Legal Entity Appointed Representative - LEAR** – The project, which is expected to receive a total of **3 M€** (€3,000,000) (https://www.mise.gov.it/it/incentivi/poli-europei-di-innovazione-digitale-european-digital-innovation-hubs-edih), has obtained the seal-of-excellence and we are awaiting the financing decree for the total amount or for a portion, at the moment not known.

3. - **2022 - "1LIVEXYLELLA - Portable technologies and innovative protocols for the ultra-sensitive diagnosis of Xylella fastidiosa directly in plants and vectors"** funded by the Ministry of Agriculture - MIPAAF D.M. n.419161 of 09/13/2022 – **Prof. Torsi is the Coordinator** and the funding is **0.976 M€.**

4. - **2022 - "DARE - Digit a Lifelong Prevention"** Code PNC0000002, funded by the Ministry of University and Research as part of the National Plan for Complementary Investments - HUB: Alma Mater Studiorum - University of Bologna - **Prof. Torsi is responsible for the Task 4.3 finaced with 0,838 M€**.

5. – **2022 - "INNOVA - Italian network of excellence for advanced diagnosis"** - code PNC-E3-2022-23683266 PNC-HLS-DA" - Funded by the European Union Next Generation EU, Ministry of Health Directorate General for Research and Innovation in healthcare, Call section: LSH-DA - HUB Institution: FOUNDATION IRCCS Ca' Granda Ospedale Maggiore Policlinico Applicant/PI Coordinator: FOUNDATION IRCCS Ca' Granda Ospedale Maggiore Policlinico – **Prof.ssa Torsi is Scientific Referent for UNIBA which is Spoke level 2** – the total funding is 86 M€ while **the funding to UNIBA is 2,812 M€**.

6. - **2021 - "Single-Molecule - Innovation Center in Single-Molecule Digital Assay"** - Agreement between the Apuglia Region and the University of Bari Aldo Moro for the implementation of the intervention "enabling technologies for the ultra-sensitive analysis of pathogens and markers -

diffusion of knowledge in the Apulian territory and creation of research and technological development chains", art. 14 of law r. no. 51 of 30 December 2021 (cup b93c22000840001) – **Prof. Torsi is the President of the Center and the assigned funding is 2,000 M€.**

7. - **2021 - "NoOne - A binary sensor with single-molecule digit to discriminate biofluids enclosing zero or at least one biomarker"** - Call: ERC-2021-STG Topic: ERC-2021-STG Type of action: HORIZON ERC Grants Granting authority: European Research Council Executive Agency – Grant awarded to Dr. Macchia, P**rof. Torsi is main collaborator and member of the executive board – Grant 2,500 M€.**

Completed projects:

8. - **2019 - "ACTUAL - At the forefront of Analytical ChemisTry: disrUptive detection technoLogies to improve food safety"** – National project PRIN-17 (2017RHX2E4). – **Prof. Torsi is the Coordinator and the awarded funding is 1,078 M€.**

9. - **2019 - "BACE - Bioelectronic Control of Cell-functions"** Åbo Akademi University Research Institutem Consortium leader by Prof. Ronald Österbacka, Co-PIs are Dr Marika Sjöqvist, Prof. M. Lindfelt, and Prof. Luisa Torsi. **The total funding is 1 M€**.

10. - **2019-2022 – "SiMBiT - Single-molecule bioelectronic smart system array for clinical testing"** – Research and Innovation Action - 824946 - H2020-ICT-2018-2020/H2020-ICT-2018-2. – **Prof. Torsi is the Project Coordinator and the funding is 3,020 M€.**

11. **– 2020-2022 "BioSCREEN - Bioelectronic devices with detection limit of a single molecule for rapid reliable and low-cost screening of symptomatic and asymptomatic subjects to COVID-19"** funded by Regione Lombardia - Regional Operative Program POR FESR 2014-2020, involving University of Brescia, University of Bari (Prof. Torsi PI) and the industrial partner INTERSAIL (Cooridnator). (POR FESR 2014-2020, ID number 1831459, CUP E81B20000320007) **total budget 0.386 M€.**

12. **- 2018-2022 - "SPACE - "Spatiotemporal Control of Cell Functions"-** Academy of Finland contract number 316883 -Collaborators Cecilia Sahlgren and Ronald Österbacka; total financing: 950 M€. **Prof. Torsi is Principal Investigator** leading a Research Unit and the funding for the operating unit is **0,390 M€.**

13. - **2018-2022 - "IDF SHARID - Innovative Devices For SHAping the RISk of Diabetes - ARS01_01270" PON"** Ricerca e Innovazione 2014-2020" (2018-2022) **Prof. Torsi is Principal Investigator** leading a Research Unit and the funding to the unit was **0,565 M€.**

14. - **2018-2022 - "PMGB - Development of mechatronic, genomic and bioinformatics platforms for precision oncology -ARS01_01195,"** PON "Research and Innovation 2014-2020" (Years 2018-2022). **Prof. Torsi is Principal Investigator** leading a Research Unit and the **funding to the unit: 0,650 M€.**

15. - **2018-2022 - "E-DESIGN - Combination of design, electronics and multifunctional materials for new aesthetic components - ARS01_01158", PON"** Research and Innovation 2014-2020" (2018-2022). **Prof. Torsi is Principal Investigator** leading a Research Unit and the **funding to the unit is 0,770 M€.**

16. - **2018-2021 - "Disposable bio-electronic sensor for HIV self-powered by a biological fuel cell"** National Research and Innovation Operational Program 2014-2020, European Social Fund, Action I.1 "Innovative Doctorates with Industrial Characterization PhD Course in Chemical and Molecular Sciences – 34th Cycle Scholarship Code: DOT1302393 – Scholarship No. 3 CUP: H94F18000250006 – **Funding assigned to the project submitted by Prof. Torsi is 0,090 M€.**

17. **- 2014-2017 - "OrgBIO - Organic Bioelectronics"** Marie Curie Initial Training Network FP7 PEOPLE 2013. **Prof.ssa Torsi is Principal Investigator** leading a Research Unit – and the **funding to the unit is 0,383 M€**

18. **- 2013-2016 - "Sense of Care - OFET biosensors for point-of-care applications"** ITN-EID Initial Training Network, European Industrial Doctorate FP7- People 2012 – **Prof. Torsi is Project Coordinator and funding total is 0,470 M€.**

19. **- 2010-2014 - "LABORATORIO SISTEMA - Laboratory for the Integrated Development of Science and Technology of Advanced Materials and for Innovative Devices"** Italian MIUR ministry project PON Research and Competitiveness 2007-2013 - Support for structural change-

Enhancement of structures and scientific and technological equipment-Structural strengthening - **Prof. Torsi is the Scientific Coordinator of the project which has obtained a grant of 13 M€.**
20. **- 2011-2013 -"Electronic and electrochemical biosensors"** Italian MIUR ministry PRIN 2009 Project - 2009AZKNJ7 - **Prof.ssa Torsi is Project Coordinator and the funding is 0,454 M€.**
21. - **2010-2013 "FLEXSmell -Gas Sensors on Flexible Substrates for Wireless Applications**" Marie Curie Initial Training Network FP7 PITN-GA-2009-238454. **Prof. Torsi is the Project Coordinator and the funding is 3,806 M€.**
22. **- 2010-2012 "BioEGOFET -Electrolyte-Gated Organic Field-Effect Biosensor" –** Strep project FP7 - ICT-2009-3.3-Flexible, Organic and Large Area Electronics. **Prof. Torsi is Principal Investigator** leading a Research Unit and the **funding for the research unit is 0,485 M€.**
23. **- 2009-2012 - "Study and development of innovative polymeric materials for applications in corneal laser surgery"** - Strategic project of the Puglia Region CIP: PS_046. **Prof. Torsi is Principal Investigator** leading a Research Unit and **the funding to the unit is 0,233 M€.**
24. - **2009-2012 "AgroBioPack - Technologies for the Bioactive Packaging of Fresh Dairy Products from Puglia -"** - MIUR-MEF Project of the Puglia Region DM 29040. **Prof. Torsi is the Principal Investigator** leading a Research Unit and the **funding to the unit is 0,119 M€.**
25. - **2009-2012 - "DM01 - Sensors and Laser Micro-Processings for Automotive and Manufacturing Applications"** DM01 project of the Apulian mechatronics technological district – MEDIS. **Prof. Torsi is Principal Investigator** leading a research unit and the **funding to the unit is 0.205 M€**.
26. - 2011 - **Prof. Torsi was responsible for a Research Agreement with Merck KGaA** and the **grant was 0.120 M€**.
27. - **2007-2008 - "Plastic bio-FET sensors"** MIUR PRIN 2006 Project – 2006037708 (2007-2008). **Prof. Torsi is Project Coordinator and the funding was 0.152 M€.**
28. - **2006-2007 - "Characterization of the factors that influence the lapping of ceramic materials surfaces by means of diamond-based abrasives"** SAM Abrasivi srl Industrial research project. **Prof. Torsi is the recipient of a budget of 0.015 M€.**
29. - **2006 "Development of low impact chemical methodologies"** - Banca Cari-puglia Projects Foundation for the year 2006. **Prof. Torsi is Project Coordinator and the funding is 0.070 M€.**
30. - **2006 "Organic Thin Film Transistor Based Sensors - Detection of toxic gas sensors (NOx, CO and H2S) at the 20-50 ppm level"** - Singaporean Defense Science Organization, Temasek Labs - JPP MD-NTU/06 /0 - P**rof. Torsi is the Co-Principal Investigator and the assigned funding is 0.120 M€**.

ORGANISATION OF MAJOR SCIENTIFIC MEETINGS

2023 ***Co-Chair*** 16th European Conference on Molecular Electronics (ECME) – Bari,
2021 ***Co-Director of the Workshop***: Fundamental mechanisms to drive progresses in organic, and large-area bioelectronics – Ettore Majorana Center – Erice, suspended due to the pandemic,
2020 ***Member of the Boston Millipore-Signa Study Group*** "Pandemic Supermind Activation" which brings together leaders of life sciences and other disciplines, harnessing the power of humans and technology to identify critical unmet needs of the COVID-19 pandemic https://www.pandemicsupermind.org/page/about
2020 ***Program Chair Europe*** of the Large-area, Organic & Printed Electronics Convention (LOPEC) – Munich March 24-26, 2020
2016 ***Co-Chair*** Organic Photonics + Electronics 2016 Symposium– SPIE – San Diego (USA)
2015 ***General Co-Chair*** of the Material Research Society Fall Meeting / Boston (USA) https://www.mrs.org/fall2015/
2012 ***General Chair*** of the European Material Research Society Spring Meeting / Strasburg
2008-15 ***Chair and Program Committee member*** for the organization of several Symposia and Conference for E-MRS, MRS, and SPIE

MANAGERIAL ACTIVITY

2025 ***Member of the Technical-Scientific Committee of the Biotecnopolo of Siena***, appointed by the Ministry of University and Research.

2025- ***President of the Board of Directors of ARTI*** – the Regional Agency for Technology, Technology Transfer, and Innovation

2022-24 ***President of the Apulian Mechatronics District and Digital Innovation Hub, MEDISDIH s.c.ar.l.,*** evolution of the Mechatronics Technological District strongly involved in the promotion of product and/or industrial process innovations that integrate the progress achieved by digital technologies in support of multidisciplinary mechatronics technologies http://www.medisdih.it/wp/cda/ http://www.medisdih.it/wp/cda/

2022- ***Vice-President of the Scientific Council of the National Research Council.*** The managerial structure of the CNR consists, in addition to the President, of two organs: the Board of Directors and the Scientific Council. The second has a consultative nature and is chaired by the President without the right to vote. The Vice President of the Scientific Council is elected by its members https://www.cnr.it/it/consiglio-scientifico.

2022- ***President of the Apulian Regional Innovation Center for Single-Molecule Digital Assay:*** The main aim of the Center is the realization of 1000 clinical trials with the SiMoT technology invented and developed by the group led by Prof. Torsi. Moreover, the center aims at the validation of SiMoT device that operates directly in peripheral biologics fluids of patients for the digital detection of the markers/pathogens of oncological, neurological and infectious pathologies. https://www.singlemolecule.center

2018-25 ***Member of the Board of Directors of "Fondazione Leonardo Civiltà delle Macchine"*** established by the Founding Partner Leonardo SpA which aims to promote dialogue with civil society, collaboration with stakeholders, communities and territories as well as to contribute to making people aware of Leonardo SpA as a pillar in the Country System and national asset of technological innovation https://fondazioneleonardo-cdm.com/it/fondazione/

2018-19 ***Rector's delegate*** for the management of the closure of the PON 2007/2013 and programming PON 2014/2020

2019-21 ***Member of the Sounding Board*** of MilliporeSigma R&D (Boston)

2017- ***Person in charge of the collaboration agreement*** between the University of Bari Aldo Moro and the Åbo Akademy University

2016 ***President of the European Material Research Society***; first and only woman to serve on this role https://www.european-mrs.com/meetings/2016-spring/plenary-session

2013-15 ***Vice-President*** of the European Material Research Society

2013-24 ***Chair of the Patent Committee of the University of Bari*** https://www.uniba.it/ateneo/tutela-della-proprieta-intellettuale/commissione-brevetti

INSTITUTIONAL RESPONSABILITIES

2023 ***Speech at the concluding ceremony celebrating the 100th anniversary of the National Research Council*** in the presence of President Mattarella

2022- ***Member of the Technical Committee for the Italian Strategy on Fundamental Research*** of the Ministry of University and Research https://www.mur.gov.it/sites/default/files/2022-07/Documento_Tavolo_Ricerca_Fondamentale_trasmesso.pdf

2020- ***National Representative*** appointed by the Italian Ministry of Research for Marie Skłodowska-Curie actions in the Program Committee for Horizon Europe http://www.ricercainternazionale.miur.it/media/34943/delegazione_nazionale_comitato_programma_horizon_europe.pdf

2019- ***Secretary of the Division*** of Analytical Chemistry of IUPAC https://iupac.org/body/500/

2016 Italian Representative in the Task Force Materials Characterization - European Council (EMCC) of the European Commission https://www.instm.it/public/45/Report%20Task%20Force%20Characterisation_final_23-09.pdf

2013-20 ***Expert*** appointed by the Italian Ministry of Research in the Italian Program Committee for Nanotechnologies, Advanced Materials, Biotechnology, and Advanced Manufacturing and Processing of Horizon 2020

2017-23 ***Coordinator of the Doctoral Degree Course*** in Chemical and Molecular Sciences Department of Chemistry, University of Bari

2010-15 ***Coordinator of the Degree Course*** in Materials Science - University of Bari

2011-13 ***Coordinator of the Scientific Commission*** of the Italian Chemical Society https://www.soc.chim.it/it/printpdf/18

2010-13 ***Member of the Board*** of the Analytical Chemistry Division of the Chem. Italian

2007-10 ***National Coordinator*** of the "Sensors Group" of the Italian Chemical Society

2006-07 ***Director of the Bari Unit*** of the National Consortium for Materials Science and Technology – INSTM

COMMISSION OF TRUST

2023- ***Member of the Regional Observatory*** for the Digital Agenda in Apulia

2022- ***Member of the International Advisory Board*** of Advanced Electronic Materials https://onlinelibrary.wiley.com/page/journal/2199160x/homepage/2707_edbd.html

2021- ***Member of the Board*** of the International Organization for Chemical Sciences in Development (IOCD) http://www.iocd.org/v3_site/About/gov_adm.html

2020-21 ***President of the Jury*** for the assignment of prizes of the European Chemical Society (EuChemS) Division of Analytical Chemistry

2019-20 ***Member of the Fellow award sub-committee*** of the Material Research Society (USA)

2018- ***Senior Editor*** of ACS Omega https://pubs.acs.org/page/acsodf/editorial-board.html

2014 ***Member of the ICT review panel*** / Swedish Research Council / Sweden

2014 ***Member of the ICT*** review panel / Research Council - Academy of Finland /Finland

2014- ***Official Nominator*** for the "Japan Prize"

2013 *Member of the PE5 ERC* Consolidator Grants panel https://erc.europa.eu/sites/default/files/document/file/erc_2013_cog_panel_members.pdf

2012 ***Member of the Chemistry Panel*** of GEV Area 3 – ANVUR VQR 2004-2010 https://www.anvur.it/attivita/vqr/vqr-2004-2010/gev/area-3-scienze-chimiche/area-3-components-and-organization/

2010-12 ***Chair of the Evaluation Panel*** of the European Commission for Marie Curie Actions – Research Fellowships; she fulfilled this role for three consecutive years

2016-17 **Regional Editor for Europe** of "Flexible and Printed Electronics" Journal of the Institute of Physics

MAIN TEACHING ACTIVITY *(last five years)*

Each academic year prof. Torsi has carried out no less than 350 hours of overall teaching activity, of which at least 60 hours of frontal teaching activity; the specific courses held in the last 5 years were the following:

- ***Analytical Chemistry of Materials*** for the master's degree course in Materials Science and Technology (6 academic credits)

- ***Analytical Chemistry II with Laboratory*** for the bachelor's degree course in Materials Science and Technology (6 academic credits)

- ***High-performance bioelectronic sensors*** for the Ph.D. course in Chemical and Molecular Sciences (2 academic credits).

ACTIVITY AS TRAINER

Present group size: 1 PI, 1 associate professor, 1 Assistant Professors (tenure track), 3 Assistant Professors (non-tenure), 2 Post Docs, 6 PhDs, 1 Project Manager. ***Supervision activity since 2000:*** of 13 Post docs, 22 PhD Students, 41 Master students, 4 Project managers. ***Former students now holding a faculty position*** (13): associate, assistant professor as well as permanent research scientists in Sweden, USA, Italy, Northern Ireland, France.

DISSEMINATION

Prof. Torsi is also very much engaged with dissemination to the wide public, here are the links to some of those activities:
- https://theanalyticalscientist.com/issues/2024/articles/jul/the-backbone-of-diagnostics/
- https://youtu.be/Fmo8VuZlh94?si=iw8o-HINbnd8xdfe
- https://thepathologist.com/inside-the-lab/the-backbone-of-diagnostics
- https://www.labmate-online.com/

ACTIVITIES TO SUPPORT WOMEN IN STEMS

Torsi is actively engaged in promoting women in STEM and as a role model for young female scientists. She has given several talks on this topic, including a TEDx seminar (https://www.youtube.com/watch?v=Oxiq6OmMUYs). In a recent campaign to foster gender equality in science among children, prof. Torsi was featured in a story of TOPOLINO (Italian comic digest-size series of Disney comics), as "Louise Torduck", a successful female scientist of the Calisota valley. She also performed the following tasks:

- Author of the editorial published on ACS Omega entitled: "Let Us Together Shine a Light on Women in STEM" https://pubs.acs.org/doi/10.1021/acsomega.0c01236.
- Invited speech entitled "How not to STEM women's potential" in the presence of the Swedish Minister for Equal Opportunities at the workshop entitled "Women in Innovation and Sustainability" held in Stockholm.
- Selected by the Bracco Foundation and the Representation in Italy of the European Commission among the #100 Experts in Science, Technology, Engineering and Mathematics (STEMs) (https://100esperte.it). Corriere della Sera and the "Uno Mattina" program highlighted the initiative and the photographer Gerald Bruneau portrayed some of the experts giving birth to an exhibition #Una-VitadaScienziata, set up at the Italian Diagnostic Center in Milan and at the Italian Embassy in Washington.
- Several interviews in local and national newspapers.

Bari, January 2026