

# Gianni Ciofani, Ph.D.

## Senior Researcher Tenured

Italian Institute of Technology  
Smart Bio-Interfaces, Principal Investigator  
Center for Materials Interfaces, Coordinator  
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## Summary

**Gianni Ciofani** (born in La Spezia, Italy, on August 14th, 1982), Ph.D., is Senior Researcher Tenured at the *Istituto Italiano di Tecnologia* -Italian Institute of Technology, IIT- (Pontedera, Italy; since 2019), where he is Principal Investigator of the Smart Bio-Interfaces Research Unit (since 2017) and Coordinator of the Center for Materials Interfaces (since 2021). He has been Associate Professor at the Polytechnic University of Torino (Torino, Italy; 2015-2019) and Visiting Professor at Waseda University (Tokyo, Japan; 2021) and at the Pontifical Catholic University of Rio de Janeiro (Rio de Janeiro, Brazil; 2024).

His main research interests concern smart nanomaterials for nanomedicine, microphysiological systems, and nanomedicine in altered gravity conditions. He is coordinator or unit leader of several projects (about 6.5 MEur granted): in particular, he was awarded with a Starting Grant and three Proof-of-Concept Grants by the European Research Council (ERC). Thanks to grants from the Italian Space Agency and the European Space Agency, he had the opportunity to carry out four experimental campaigns onboard the International Space Station. In 2018, his real-scale model of the blood-brain barrier was highlighted in the Annual Report on the ERC Activities and Achievements.

Gianni Ciofani is author of about 200 papers on international journals (WoS *H-index* 56), 3 edited books, and 18 book chapters, and delivered about 80 invited talks/lectures in international contexts. He serves as Panel Member / Reviewer for many funding agencies (including ERC, Swiss National Science Foundation, French National Research Agency, National Science Center of Poland), for about 200 international journals, and as Editorial Board Member of *Bioactive Materials*, *International Journal of Nanomedicine*, *Journal of Physics: Materials*, *Nanomedicine UK*, *Nano Trends*, and *Scientific Reports*; he is Specialty Chief Editor (Nanobiotechnology) for *Frontiers in Bioengineering and Biotechnology*. He has been consistently ranked in the Stanford University's list of "World's Top 2%" scientists since 2020 (Elsevier data).

During his career, he held courses at the Polytechnic University of Torino, at Waseda University, and at the Pontifical Catholic University of Rio de Janeiro, and is currently holding a course for Ph.D. students at the Sant'Anna School of Advanced Studies (Pisa, Italy); he is / has been supervisor of about 50 M.Sc. students and 20 Ph.D. students.

He is co-founder (2022) and Scientific Advisor of "Kidaria Bioscience SRL", an IIT spin-off company dedicated to the preparation and characterization of cosmetic and nutraceutical products based on natural-derived active ingredients. He is also co-founder (2021) and member of the executive committee of "ERC in Italy APS", a non-profit association of ERC awardees born to promote fundamental and frontier research in Italy.

Gianni Ciofani is Knight of the Order of Merit of the Italian Republic, appointed by the President of the Italian Republic on December 27th, 2022.

## Education

- January 18th, 2010

Ph.D. in Innovative Technologies, Sant'Anna School of Advanced Studies of Pisa (Italy), with the thesis "Study and design of drug delivery systems for cell therapy". Final mark: 100/100 *summa cum laude*

- January 30th, 2007

Professional qualification (Industrial Engineering - Marks 234/240)

- November 16th, 2006

Diploma in Engineering, Sant'Anna School of Advanced Studies of Pisa (Italy), with the thesis "Carbon nanotube mediated electroporation for *in vivo* gene therapy: A feasibility study". Final mark: 100/100 *summa cum laude*

- July 4th, 2006

M.Sc. in Biomedical Engineering, School of Engineering of the University of Pisa (Italy), with the thesis "Theoretical and experimental study of a system for the neuronal regeneration". Final mark: 110/110 *summa cum laude* and with "Excellence Award"

- July 13th, 2004

B.Sc. in Biomedical Engineering, School of Engineering of the University of Pisa (Italy), with the thesis "Study of a microparticle-based system for enzyme immobilization suitable for an extracorporeal device". Final mark: 110/110 *summa cum laude*

- July 4th, 2002

Musical diploma in clarinet, Conservatory "Giacomo Puccini" of La Spezia (Italy). Final mark: 8/10

- July 13th, 2001

High School degree, Scientific High School "Ulisse Dini" of Pisa (Italy). Final mark: 100/100

### Scientific experience

- March 1st, 2021 - present

Center Coordinator, Italian Institute of Technology, Center for Materials Interfaces (Pontedera, Italy)

- November 1st, 2019 - present

Senior Researcher Tenured, Italian Institute of Technology, Smart Bio-Interfaces (Pontedera, Italy)

- August 8th, 2022 - present

Scientific Advisor, Kidaria Bioscience SRL (Monterosso al Mare, Italy)

- September 23rd, 2024 - October 13th, 2024

Visiting Professor, Pontifical Catholic University of Rio de Janeiro, Department of Physics (Rio de Janeiro, Brazil)

- October 16th, 2021 - December 19th, 2021

Visiting Professor, Waseda University, Unit for Energy and Nanomaterials (Tokyo, Japan)

- March 1st, 2017 - October 31st, 2019

Senior Researcher, Italian Institute of Technology, Smart Bio-Interfaces (Pontedera, Italy)

- October 26th, 2015 - October 31st, 2019

Associate Professor, Polytechnic University of Torino, Department of Mechanical and Aerospace Engineering (Torino, Italy)

- November 2nd, 2015 - February 28th, 2017

Affiliated Researcher, Italian Institute of Technology, Center for Micro-BioRobotics (Pontedera, Italy)

- September 1st, 2013 - October 25th, 2015

Researcher, Italian Institute of Technology, Center for Micro-BioRobotics (Pontedera, Italy)

- January 16th, 2010 - August 31st, 2013

Post-Doctoral fellow, Italian Institute of Technology, Center for Micro-BioRobotics (Pontedera, Italy)

- January 15th, 2007 - January 14th, 2010

Ph.D. student in Innovative Technologies, Sant'Anna School of Advanced Studies of Pisa, Center for Research in Microengineering (Pontedera, Italy)

- December 3rd, 2007 - January 15th, 2010

Research assistant, Sant'Anna School of Advanced Studies of Pisa, Center for Research in Microengineering (Pontedera, Italy)

- November 1st, 2008 - June 20th, 2009

Visiting Ph.D. student, Center of Investigation "Principe Felipe", Polymer Therapeutics Laboratory (Valencia, Spain)

- September 24th, 2007 - November 25th, 2007

Visiting Ph.D. student, Waseda University, Department of Life Science and Medical Bioscience, School of Advanced Science and Engineering, in the framework of the Italy-Japan Joint Lab ROBOCASA (Tokyo, Japan)

- July 25th, 2006 - December 24th, 2006

Research assistant, Sant'Anna School of Advanced Studies of Pisa, Center for Research in Microengineering (Pontedera, Italy)

## Research projects

### Grants

1. Ovarian follicle-on-chip model for the investigation and treatment of microgravity-dependent abnormalities by using a machine learning approach (OFMAT), grant number 4000145476, European Space Agency, 2025-2027 (Principal Investigator)
2. Biomimetic sensorized barriers-on-a-chip: Unveiling a new generation of market-ready investigation tools (BiSCUIT), grant number 101146025, European Research Council (ERC) Proof of Concept Grant, 2024-2025 (Principal Investigator)
3. Modulation of microglia through extracellular vesicles in altered gravity (MOM-EVA), grant number 4000143015, European Space Agency, 2024-2026 (Principal Investigator)
4. A model to evaluate the effects of microgravity on the structural and functional properties of the blood-brain barrier (BBBinSpace), grant number 4000142112, European Space Agency, 2024-2026 (Principal Investigator)
5. Integrated assessment and advanced characterization of neuro-nanotoxicity (iCare), grant number 101092971, Research and Innovation Action, 2023-2026 (Unit Coordinator)
6. Innovative tools to treat and model complex cancer environments (TheraTools), grant number 101073404, Marie Skłodowska-Curie Action - Doctoral Network, 2023-2026 (Unit Coordinator)
7. Patient-derived hybrid nanocarriers for personalized nanomedicine of glioblastoma multiforme (CyberNano), grant number 24454, *Fondazione AIRC*, 2021-2025 (Principal Investigator)
8. Tuscany Health Ecosystem (THE), grant number ECS00000017, PNRR Innovation Ecosystem, 2022-2025 (Unit Coordinator)
9. Protection mediated by antioxidant nanotechnology against neuronal damage in space (PROMETEO), grant number 2021-2-R.O, Italian Space Agency, 2022-2025 (Principal Investigator)
10. Advanced 3D *in vitro* models based on magnetically-driven docking of modular microscaffolds (MagDock), grant number 101081539, European Research Council (ERC) Proof of Concept Grant, 2023-2024 (Principal Investigator)
11. Nichoid in space: Advanced *in vitro* models for "on orbit" investigations (Nichoid-ET), grant number 4000133244/20/NL/GLC, European Space Agency, 2021-2022 (Principal Investigator)
12. Elucidating modes of interaction of redox-active nanomaterials with biological systems exposed to microgravity (InterGravity), grant number 4000129652/20/NL/MH/ac, European Space Agency, 2020-2022 (Principal Investigator)
13. A deep characterization of a nanotechnological antioxidant for space using simple invertebrates (NanOxSpace), grant number 4000130094/20/NL/MH/ac, European Space Agency, 2020-2022 (Principal Investigator)
14. Advanced *in vitro* physiological models: Towards real-scale, biomimetic and biohybrid barriers-on-a-chip (BBBhybrid), grant number 832045, European Research Council (ERC) Proof of Concept Grant, 2019-2020 (Principal Investigator)
15. Insight into new therapeutic preclinical strategies in autosomal recessive spastic ataxia of Charlevoix-Saguenay type, grant number RF-2016-02361610, Italian Ministry of Health, 2018-2022 (Unit Coordinator)
16. Nanotechnological countermeasures against oxidative stress in muscle cells exposed to microgravity (NOEMI), project number ILSRA-2014-0012 (implementation phase), European Space Agency & grant number 2018-0156, *Fondazione CaRiPlo*, 2018-2020 (Principal Investigator)
17. Magnetic solid lipid nanoparticles as a multifunctional platform against glioblastoma multiforme (SLaMM), grant number 709613, European Research Council (ERC) Starting Grant, 2017-2022 (Principal Investigator)
18. Cerium oxide nanoparticles as countermeasure against reactive oxygen species production in altered gravity conditions: Preliminary investigation on planarians (PlanOx2), grant number CORA-GBF-2017-001, European Space Agency, 2017-2019 (Principal Investigator)
19. Nanotechnology solutions against oxidative stress in muscle tissue during long-term microgravity exposure (NANOROS), grant number 2016-7-U.O, Italian Space Agency, 2016-2019 (Principal Investigator)

20. Starting grant “*Compagnia di San Paolo*”, grant number 55\_AI16GC01, *Compagnia di San Paolo*, 2016-2018 (Principal Investigator)
21. New self-powered devices for cochlear stimulation based on piezoelectric nanomaterials, grant number RF-2011-02350464, Italian Ministry of Health, 2014-2018 (Unit Coordinator)

### ***Supervised granted fellowships***

1. Polydopamine nanoparticles-based hyperthermal chemotherapy in the treatment of liver cancer, grant number 26814-2021, AIRC Fellowship, 2022-2025 (Supervisor of Dr. Melis Emanet)
2. Evaluating anti-angiogenic effects of trastuzumab-decorated piezoelectric nylon-11 nanovectors in breast cancer, grant number 26590-2021, AIRC Fellowship, 2022-2023 (Supervisor of Dr. Ozlem Sen)
3. Development of novel approaches using trimagnetic nanoparticles for intracellular hyperthermia of prostate cancer cells, grant number 800924, Marie Skłodowska-Curie / AIRC Fellowship, 2020-2023 (Supervisor of Dr. Valentin Nica)
4. A biomimetic and neuroprotective delivery nanocapsule for the targeted treatment of post-ischemic stroke effects (BIONICS), grant number 793644, Marie Skłodowska-Curie Individual Fellowship, 2018-2020 (Supervisor of Dr. Christos Tapeinos)
5. Piezoelectric nanoparticle-mediated inhibition of cell proliferation: Molecular mechanisms in breast cancer and therapeutic implications, grant number FUV-2017, *Fondazione Umberto Veronesi* Fellowship, 2017-2018 (Supervisor of Dr. Attilio Marino)

### ***In-kind projects***

1. Nanotechnological countermeasures against oxidative stress in muscle cells exposed to microgravity (NOEMI), project number ILSRA-2014-0012 (definition phase), European Space Agency, 2015-2017 (Principal Investigator)
2. *In vitro* effects of the Bayer's proprietary compound BAY 43-9006 (Sorafenib) linked to magnetic nanoparticles on HepG2 cell line, project number US208314731, Bayer HealthCare Pharmaceuticals Inc., 2014-2016 (Principal Investigator)

## **International scientific activities**

### ***Project proposal evaluation***

- National Science Center of Poland, Panel Chair (2023, 2025)
- National Science Center of Poland, Panel Member (2022)
- Remote evaluator for: Dutch Research Council (2025), Latvian Council of Science (2024, 2025), Israel Science Foundation (2019, 2025), Higher Education and Science Committee (HESC) of the Republic of Armenia (2024, 2025), European Research Council (2018, 2020, 2023, 2024), Swiss National Science Foundation (2018, 2019, 2020, 2022, 2023, 2024), French National Research Agency, ANR (2015, 2019, 2022, 2023, 2024), *Deutschen Forschungsgemeinschaft*, DFG (2021, 2024), National Science Center of Poland (2017, 2018, 2019, 2023, 2024), *Progetti di Rilevante Interesse Nazionale*, PRIN Italy (2021, 2023), *Fondazione CaRiPlo* (2023), Wellcome trust/DBT India Alliance (2016, 2021, 2023), European Space Agency, ESA (2022), Austrian Science Fund, FWF (2022), American University of Beirut, Lebanon (2021), Research Quality Assessment (VQR) for the Italian National Agency for the Evaluation of Universities and Research Institutes (2021), Worldwide Cancer Research grants (2021), Dutch Research Council (2019), Estonian Research Council, ETAg (2015, 2019), Chilean National Commission for Scientific and Technological Research, CONICYT (2016)

### ***Organized scientific and dissemination events***

- Co-organizer of the “ERC in Italy 2025 event” (Roma, Italy; February 13th - 14th, 2025)
- Organizer of the dissemination initiative “*Scienza in Biblioteca - Incontri con i Ricercatori del Laboratorio Smart Bio-Interfaces dell'Istituto Italiano di Tecnologia*” (Bientina, Italy; April 29th - May 13th, 2024)
- Co-organizer and moderator of the “ERC in Italy 2024 event” (Roma, Italy; February 19th - 20th, 2024)

- Organizer and co-chair of the symposium “Advanced *in vitro* models: From organs-on-chips to advanced 3D architectures”, 33rd Conference of the European Society for Biomaterials (Davos, Switzerland; September 7th, 2023)
- Organizer and co-chair of the symposium “Antioxidant nanomaterials for biomedical applications”, 32nd Conference of the European Society for Biomaterials (Bordeaux, France; September 5th, 2022)
- Organizer and co-chair of the “Bio-Nano International Workshop” (On-line; September 29th, 2021)
- Organizer and co-chair of the symposium “Smart (nano)biomaterials and their applications”, 31st Conference of the European Society for Biomaterials (Porto, Portugal; September 6th, 2021)
- Organizer and co-chair of the “Bio-Nano Cross-Over International Workshop” (On-line; May 25th, 2021)
- Organizer and co-chair of the symposium “Tissue engineering under external stimuli”, TERMIS-EU (Rhodes, Greece; May 28th, 2019)
- Organizer and general chair of the International Workshop “Advanced theranostic nanomedicine in oncology” (Pontedera, Italy; January 31st, 2019)
- Organizer and general chair of the International Workshop “Smart tools for caring: Nanotechnology meets medical challenges” (Pontedera, Italy; March 2nd, 2018)

### **Service for international journals**

- Specialty Chief Editor of *Nanobiotechnology*, specialty section of *Frontiers in Bioengineering and Biotechnology* (2018-present)
- Associate Editor of *Nanobiotechnology*, specialty section of *Frontiers in Bioengineering and Biotechnology* (2017-2018)
- Editorial Board Member of *Nano Trends* (2022-present), *Nanomedicine UK* (2020-present), *Scientific Reports* (2019-present), *Journal of Physics: Materials* (2019-present), *Bioactive Materials* (2019-present), *International Journal of Nanomedicine* (2018-present)
- Guest Editor of the Research Topics “Space (Nano)Medicine” (2020-2022), “Advanced Theranostic Nanomedicine in Oncology” (2018-2020), “Antioxidant Nanomedicine” (2019-2020), and “Smart Tools for Caring: Nanotechnology Meets Medical Challenges” (2018-2019) for *Frontiers in Bioengineering and Biotechnology*
- Guest Editor of the Focus Issues “Nanophotosensitizers for Cancer Therapy” (2021), and “Piezoelectric Materials for Nanomedicine Applications” (2020) for *Journal of Physics: Materials*
- Guest Editor of the Special Issue “Exploring Challenges ahead of Nanotechnology for Biomedicine” for *Bioactive Materials* (2016-2017)
- Guest Editor of the Special Issue “Nanoparticle-Mediated Cell and Tissue Stimulation” for *Nanomaterials* (2016-2017)
- Referee for about 200 international journals, among which: *ACS Applied Materials and Interfaces*, *ACS Nano*, *Acta Biomaterialia*, *Advanced Functional Materials*, *Advanced Healthcare Materials*, *Advanced Materials*, *Advanced Science*, *Biomaterials*, *Journal of Controlled Release*, *Macromolecular Bioscience*, *Materials and Design*, *Nanomedicine*, *Nature Communications*, *Scientific Reports*, *Small*

### **Service for international conferences**

- Session chair at the NanoBalkan International Conference (Tirana, Albania; October 28th – November 1st, 2024)
- Scientific Board member of the 6<sup>th</sup> International Congress on Biosensors (Konya, Turkey; September 5th - 7th, 2024)
- Scientific Advisory Board member of the 33rd Conference of the European Society for Biomaterials (Davos, Switzerland; September 4th - 8th, 2023)
- Session chair at the European Materials Research Society Spring Meeting (Strasbourg, France; May 29th - June 2nd, 2023)
- Session chair at the Trends in Nanotechnology Conference (Tirana, Albania; October 3rd - 7th, 2022)
- Session chair at the 32nd Conference of the European Society for Biomaterials (Bordeaux, France; September 4th - 8th, 2022)
- Session chair at the Trends in Nanotechnology Conference (Tirana, Albania; October 4th - 8th, 2021)

- Session chair at the 31st Conference of the European Society for Biomaterials (Porto, Portugal; September 5th - 9th, 2021)
- Session chair at the Orbitaly Conference (Milano, Italy; October 17th - 19th, 2018)
- Session chair at the East-West Chemistry Conference (Skopje, Macedonia; October 12th - 14th, 2017)
- Session chair at the NanoBio&Med 2016 Conference (Barcelona, Spain; November 22nd - 24th, 2016)
- Member of the international advisory committee of the 1st biennial conference BioMaH "Biomaterials for Tissue and Genetic Engineering and Role of Nanotechnology" (Roma, Italy; October 17th - 20th, 2016)
- Session chair at the 10th Nanoscience and Nanotechnology Conference (Istanbul, Turkey; June 17th - 21st, 2014)
- Member of the international advisory committee and session chair of the Energy Materials and Nanotechnology Spring Meeting (Las Vegas, USA; February 27th - March 2nd, 2014)
- Referee for the following international conferences: NER 2013, EMBC 2013, EMBC 2014, MNM 2014, ICRA 2014, IROS 2014, IROS 2015, EMBC 2015, ICRA 2016, EMBC 2016, NER 2017, EMBC 2017, EMBC 2018, NER 2019, EMBC 2019, EMBC 2020, NER 2021, EMBC 2021, EMBC 2022, NER 2023, EMBC 2023, ESB 2023, WBC 2024, EMBC 2024, EMBC 2025

#### ***Service for scientific organizations***

- ERC in Italy APS, member of the executive committee (secretary); 2021 - present
- *Accademia di Gagliato*, president of the selection committee for the "Salvatore Venuta" scholarships; 2022-2024
- Member of the round-table for the definition of the Space Life Sciences Roadmap of the Italian Space Agency, chair of the work-group "Pharmaceutics, Technologies, and New Experimental Models"; 2020-2022

#### ***Membership of scientific organizations***

- Sigma Xi, The Scientific Research Honor Society; 2023 - present
- ERC in Italy APS; 2021 - present
- Association of ERC Grantees (AERG); 2021 - present
- American Chemical Society (ACS); 2020 - present
- *Gruppo Nazionale di Bioingegneria* (GNB); 2019 - present
- European Society for Biomaterials (ESB); 2014 - present

#### ***Technology transfer activities***

- Co-founder and Scientific Advisor of Kidaria Bioscience SRL ([www.kidaria.it](http://www.kidaria.it)), an IIT start-up incorporated on May 31st, 2022, aiming at the preparation, characterization, and testing of vegetal extracts with antioxidant properties for cosmetic and nutraceutical applications
- 2nd place at the StartCup Toscana Contest for NABIS, a start-up project aiming at the development of nanostructured platforms for advanced *in vitro* models (2022)
- "2031" Award for the NABIS start-up project (2021)
- Pre-acceleration program "Bocconi for Innovation (B4I)" of Bocconi University (Milano, Italy) for the Kidaria Bioscience start-up project (27/02/2021 - 08/06/2021)
- SmartCup Liguria 2020: Life Science Section Award, "Confesercenti Liguria" Award, "Studio Demetra" Award, "Associazione Culturale Sintesi" Award, "EBN Business Innovation Network" Award, and "InnoEU" Award for the Kidaria Bioscience start-up project

#### ***Academic service***

- Faculty member of the Ph.D. course in BioRobotics, Sant'Anna School for Advanced Studies (Pisa, Italy), a.y. 2017/2018 - present
- Member of the committee for the admission and for the final examination of the Ph.D. course in BioRobotics, Sant'Anna School for Advanced Studies (Pisa, Italy), a.y. 2013/2014 - present
- Committee member for the selection of the Director of the Department of Physical Science & Materials Technology of the Italian National Research Council (-CNR-, 2023)

- Committee member for the selection of the Director of the Institute of Nanoscience of the Italian National Research Council (-CNR-, 2023)
- Faculty member of the B.Sc. and M.Sc. courses in Biomedical Engineering, Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2019/2020
- Member of committees for the selection of Assistant Professors at the Polytechnic University of Torino (Torino, Italy)
- Member of committees for the evaluation of Assistant Professors at the Sant'Anna School for Advanced Studies (Pisa, Italy)
- Member of committees for the selection of post-doctoral fellows at the Sant'Anna School for Advanced Studies (Pisa, Italy), Polytechnic University of Torino (Torino, Italy), and Italian Institute of Technology (Genova, Italy)
- External evaluator and/or member of the final exam committee for Ph.D. candidates at University of Coimbra (Portugal), University of Minho (Portugal), Uppsala University (Sweden), Polytechnic University of Milano (Milano, Italy), Polytechnic University of Torino (Torino, Italy), University of Torino (Torino, Italy), Indian Institute of Technology (Roorkee, India), Sant'Anna School for Advanced Studies (Pisa, Italy), University of Genova (Genova, Italy), University Federico II (Napoli, Italy), Yeditepe University (Istanbul, Turkey), University of Salento (Lecce, Italy), National University of Ireland (Galway, Ireland)
- National Scientific Qualification, obtained from the Italian Ministry of University and Research, to the function of Full Professor of Experimental Matter Physics (2018-2030), Applied Physics (2017-2029), and Bioengineering (2017-2029)

### Teaching activities

- *Introduction to bionanomaterials*, Sant'Anna School for Advanced Studies (Pisa, Italy), a.y. 2019/2020 – present
- *Bionanomaterials for theranostic applications*, Pontifical Catholic University of Rio de Janeiro (Rio de Janeiro, Brazil), a.y. 2024/2025
- *Advanced bio-molecular assembling science* (Collaborator), Waseda University (Tokyo, Japan), a.y. 2021/2022
- *Biomimetic systems*, Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2018/2019
- *Bionanotechnologies*, Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2018/2019
- *Cell and tissue engineering* (Collaborator), Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2019/2020
- *Engineering for regenerative medicine* (Collaborator), Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2016/2017
- *Bioinspired soft robotics: Fundamentals on fabrication and characterization technologies* (Collaborator), Sant'Anna School for Advanced Studies (Pisa, Italy), a.y. 2016/2017 - 2018/2019
- *Chemical bioengineering* (Collaborator), Polytechnic University of Torino (Torino, Italy), a.y. 2015/2016 - 2016/2017
- *Fundamental technologies for micro-biorobotics* (Collaborator), Sant'Anna School for Advanced Studies (Pisa, Italy), a.y. 2013/2014 - 2015/2016

### Mentoring activities

#### Ph.D. students

1. *Bioinspired intestinal-barrier-on-a-chip for drug testing and disease modeling*. Candidate: Giulia Gigante, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Graduation expected in 2027
2. *Personalized in vitro models of the blood-brain barrier*. Candidate: Beatriz Amanda Barbosa Rangel Dos Passos, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy) and Ph.D. course in Applied Chemistry and Polymeric Materials, University of Basque Country (Spain). Graduation expected in 2027

3. *Self-assembled sensorized 3D models of the blood-brain tumor barrier*. Candidate: Kamil Andrzej Ziája, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy) and Ph.D. course in Materials Science and Engineering, University of Aveiro (Portugal). Graduation expected in 2027
4. *Multilayer polymer capsules with sono-responsive properties as antibody nanocarriers capable of crossing the blood-brain barrier*. Candidate: Amirreza Mansoorikermani, Ph.D. course in Applied Chemistry and Polymeric Materials, University of Basque Country (Spain) and Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Graduation expected in 2027
5. *Blood-brain barrier model based on perfusable flexible tubes to tailor the biophysical and chemical environment for drug delivery*. Candidate: Maria Alexaki, Ph.D. course in Materials Science and Engineering, University of Aveiro (Portugal) and Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Graduation expected in 2027
6. *Multi-modal modulation of cell activities in cancer therapy*. Candidate: Maria Cristina Ceccarelli, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Graduation expected in 2026
7. *Design and optimization of piezoelectric organic nano transducers for biomedical applications*. Candidate: Margherita Montorsi, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved; January 2025
8. *A new generation of multi-tool biodegradable platform for biomedical applications*. Candidate: Alessio Carmignani, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved *cum laude*; November 2023
9. *Smart organic nanostructures against neurological diseases*. Candidate: Melike Belenli, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved; November 2023
10. *Engineered in vitro models to mimic the anatomy and physiology of the human alveolus through advanced biomaterials and nanotechnologies*. Candidate: Michela Licciardello, Ph.D. course in Doctoral Program in Bioengineering and Medical-Surgical Sciences, Polytechnic University of Torino & University of Torino (Italy). Final Mark: Approved *cum laude*; July 2022
11. *Innovative drugs against degenerative disease: Applications for Earth and space biomedicine*. Candidate: Nicoletta di Leo, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved *cum laude*; June 2022
12. *Nanotechnology solutions and advanced in vitro models for the treatment of glioblastoma multiforme*. Candidate: Daniele De Pasquale, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved *cum laude*; April 2021
13. *Cerium oxide nanoparticles: A powerful nanotechnological tool in modulating reactive oxygen species detrimental effects*. Candidate: Ilaria Pezzini, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved; September 2020
14. *Smart nanomaterials for the treatment of central nervous system diseases*. Candidate: Matteo Battaglini, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final Mark: Approved *cum laude*; May 2020
15. *Organic bioelectronics platforms for electrical and chemical stimulation of biological systems*. Candidate: Alberto Bonisoli, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100; June 2018
16. *Smart nanomaterials to overcome highly invasive tumor resistance*. Candidate: Agostina Francesca Grillone, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100 *summa cum laude*; June 2017
17. *Nanoparticles and nanostructured surfaces as smart solutions for the modulation of cellular functions*. Candidate: Attilio Marino, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100 *summa cum laude*; October 2016
18. *Smart nanomaterials for the stimulation and the differentiation of mesenchymal stem cells*. Candidate: Antonella Rocca, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100 *summa cum laude*; November 2015
19. *Overcoming the limitations of traditional medical therapies: design of functional nanostructured materials*. Candidate: Eugenio Redolfi Riva, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100 *summa cum laude*; June 2015



20. *Engineering of traditional and smart materials for interaction with living matter*. Candidate: Giada Graziana Genchi, Ph.D. course in Biorobotics, Sant'Anna School of Advanced Studies of Pisa (Italy). Final mark: 100/100 *summa cum laude*; November 2013

#### **M.Sc. students**

1. *Fabrication and characterization of innovative organic piezoelectric nanomaterials: Applications in neural stem cell activation and glioblastoma treatment*. Candidate: Tommaso Curiale, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 103/110; December 2024
2. *Development and application of a blood-brain barrier-on-chip model for investigating microglial phenotypic modulation in glioblastoma*. Candidate: Milica Redzic, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 100/110; December 2024
3. *Polydopamine nanoparticles as multitasking nanoplatforms against neurodegenerative diseases*. Candidate: Luigi Lai, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 104/110; July 2024
4. *Smart magnetic nanomaterials for the remote control of microglia activation as a potential therapy for glioblastoma*. Candidate: Giuliana Paravizzini, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 106/110; July 2024
5. *Polymeric nanoparticles for piezoelectric neural stem cell stimulation: An innovative neuroregeneration strategy for central nervous system repair*. Candidate: Arianna Barger, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; March 2024
6. *Ultrasound-triggered repolarization of microglia cells using piezoelectric nanoparticles for enhanced immunotherapy against glioblastoma multiforme*. Candidate: Martina Mazzuferi, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; July 2023
7. *Patient-personalized magnetic nanovectors for the treatment of glioblastoma multiforme*. Candidate: Michela Patrucco, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; July 2023
8. *Polydopamine nanoparticles as versatile nanoplatform for antioxidant and hyperthermal therapies*. Candidate: Francesco Schiavone, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; July 2023
9. *Patient-derived specific treatment against glioblastoma multiforme based on lipid magnetic nanovectors*. Candidate: Simone Amadio, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 103/110; March 2022
10. *Cerium oxide nanoparticles as antioxidant agents: Study of interaction with muscle cells under simulated microgravity*. Candidate: Sara Gorrieri, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; July 2021
11. *Nanostructured lipid carriers as effective delivery systems of photosensitizers for photodynamic therapy against glioblastoma multiforme*. Candidate: Marta Pero, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 102/110; July 2021
12. *Polydopamine nanoparticles for the treatment of Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay: A study about blood-brain barrier crossing*. Candidate: Jamila Colica, M.Sc. course in Molecular Biotechnologies, University of Pisa (Italy). Final mark: 106/110; May 2021
13. *Innovative bioprinting strategies based on two-photon polymerization*. Candidate: Sara Grasselli, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; March 2021
14. *Analysis of nanoceria effects on regenerative capability and stem cells of planarians exposed to oxidative stress*. Candidate: Maria Grazia D'Elia, M.Sc. course in Molecular and Cell Biology, University of Pisa (Italy). Final mark: 110/110 *summa cum laude*; October 2020
15. *Design, fabrication and characterization of a multimodal cell stimulation bioreactor for bone tissue engineering*. Candidate: Margherita Montorsi, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 106/110; October 2020
16. *Nanostructured lipid carriers for the delivery of idebenone in autosomal recessive spastic ataxia of Charlevoix-Saguenay*. Candidate: Gaia Macaluso, M.Sc. course in Molecular Biotechnologies, University of Pisa (Italy). Final mark: 110/110 *summa cum laude*; September 2020

17. *Superparamagnetic iron oxide nanoparticles loaded in hybrid lipid/polymer nanoparticles as a multifunctional platform to treat brain cancer.* Candidate: Giulio Avvenuto, M.Sc. course in Nanotechnologies for ICTs, Polytechnic University of Torino (Italy). Final mark: 104/110; July 2020
18. *Biomedical nanovectors for the transport of antioxidants of natural origin.* Candidate: Nadia Moles, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110; July 2020
19. *Optimization of transfection process to obtain fluorescent Influenza virus-like particles for drug delivery.* Candidate: Eleonora Giro, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; July 2020
20. *Polydopamine nanoparticles in the treatment of autosomal recessive spastic ataxia of Charlevoix-Saguenay.* Candidate: Alessio Carmignani, M.Sc. course in Molecular Biotechnologies, University of Pisa (Italy). Final mark: 110/110 *summa cum laude*; May 2020
21. *Electrospun cellulose acetate fibers: A new approach for in vitro models of the blood-brain barrier.* Candidate: Umberto Buratti, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 106/110; March 2020
22. *Antioxidant-loaded nanostructured lipid carriers: Evaluation of a potential therapy for neurodegenerative disorders.* Candidate: Sara Gioi, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 104/110; March 2020
23. *Biointerfaces based on conductive polymer/nanoceria composites.* Candidate: Valeria Serino, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 101/110; March 2020
24. *Analysis of brain and muscle co-activation in mobile brain/body imaging settings.* Candidate: Claudio Gabbiani, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; December 2019
25. *Characterization of lipid-based nanoparticles for magnetic stimulation of drug-resistant cancer cells.* Candidate: Mattia Ainardi, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 98/110; October 2019
26. *Effects of structural properties on magnetic heating of nanocomposite magnetic lipid vectors for glioblastoma hyperthermia.* Candidate: Deniz Aksu, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 96/110; October 2019
27. *Advanced in-vitro models of the blood-brain barrier.* Candidate: Micol Baronio, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; October 2019
28. *Development and testing of nanoparticles for the transport of antioxidant drugs in mitochondrial pathologies.* Candidate: Chiara Caracci, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). 110/110 *summa cum laude*; October 2019
29. *Alternative transfection vehicle for CRISPR/Cas9 delivery.* Candidate: Lorenza Ghione, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 102/110; October 2019
30. *Brain lipids antioxidant nanoparticles for the treatment of post-ischemic stroke insult.* Candidate: Matteo Lauria, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 104/110; October 2019
31. *Classification of breast cancer cells based on actin and EGFR imaging and machine learning.* Candidate: Daniele Mollicone, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; October 2019
32. *Follow the miRNA: Tracking the release of genetic material from novel lipidic nanoparticles in neuroblastoma using FRET imaging.* Candidate: Rosa Pascarella, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; October 2019
33. *Lipid magnetic nanovectors against glioblastoma: Investigations on blood-brain barrier crossing and on magnetothermal therapy with in vitro multicellular system.* Candidate: Alice Camponovo, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; April 2019; winner of the National Bioengineering Group master thesis award
34. *Multi-stage hybrid antioxidant nanovectors for the treatment of central nervous system pathologies.* Candidate: Federica Lucia Pepe, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 95/110; April 2019
35. *Microfluidic devices for drug nanocarriers formulation and evaluation.* Candidate: Gaia Pacassoni, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; December 2018

36. *Temporally specific optogenetic inactivation in a working memory sensorimotor task*. Candidate: Marta Boscaglia, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; October 2018
37. *Cerium oxide nanoparticle synthesis by ethylene glycol-assisted precipitation and biocompatibility assessment on C2C12 mouse myoblasts*. Candidate: Luca Davo, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 103/110; October 2018
38. *Smart piezoelectric and magnetothermal nanotransducers for the treatment of glioblastoma multiforme*. Candidate: Simone Migliorin, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 104/110; October 2018
39. *ROS-scavenging magnetic nanocubes as a novel theranostic for brain cancer*. Candidate: Francesca Tomatis, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 105/110; October 2018
40. *Delivery of piezoelectric nanotransducers across the blood-brain barrier: A smart tool for remote electric stimulation against glioblastoma multiforme*. Candidate: Enrico Almici, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; April 2018; winner of the National Bioengineering Group master thesis award
41. *TPP-functionalized nanoceria-loaded lipid nanostructures for the treatment of neurodegenerative diseases*. Candidate: Ivana Cavaliere, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 108/110; April 2018
42. *Composite scaffolds with porosity over multiple length scales for skin regeneration*. Candidate: Viola Sgarminato, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; April 2018
43. *Electrospun polymeric membranes doped with piezoelectric nanoparticles: Characterization and effects on bone-like cells*. Candidate: Michela Licciardello, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 103/110; December 2017
44. *A closed-loop neuroprosthesis with proprioceptive feedback due to mechanical vibration of tendons*. Candidate: Alessia Botta, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 110/110 *summa cum laude*; October 2017; winner of the National Bioengineering Group master thesis award
45. *Gelatin/nanoceria nanocomposite fibers as antioxidant scaffolds for neuronal regeneration*. Candidate: Daniele De Pasquale, M.Sc. course in Molecular and Industrial Biotechnologies, University of Pisa (Italy). Final mark: 104/110; December 2016
46. *Natural polymer based sub-micron fibers doped with cerium oxide nanoparticles for skeletal muscle tissue regeneration*. Candidate: Paolo Massimo di Corato, M.Sc. course in Biomedical Engineering, Polytechnic University of Torino (Italy). Final mark: 87/110; July 2016
47. *Piezoelectric thin films as artificial sensory epithelium for cochlear prosthetics*. Candidate: Maria Comito, M.Sc. course in Biomedical Engineering, University of Pisa (Italy). Final mark: 110/110; July 2016; winner of the National Bioengineering Group master thesis award
48. *Development of conducting polymer-based microwrinkled biointerfaces as smart scaffolds for stimulation and guidance of axonal growth*. Candidate: Alberto Bonisoli, M.Sc. course in Biomedical Engineering, University of Roma "La Sapienza" (Italy). Final mark: 110/110 *summa cum laude*; October 2014
49. *Development and characterization of a novel bio-hybrid robotic actuator driven by C2C12 skeletal muscle cells*. Candidate: Giada Graziana Genchi, M.Sc. course in Biotechnologies, University of Bari (Italy). Final mark: 110/110 *summa cum laude*; October 2010

### Internships

1. *In vitro biocompatibility and anti-glioblastoma activity of functionalized liposomes loaded with temozolomide under dynamic conditions*. Jessyca Aparecida Paes Dutra, (Universidade Estadual Paulista "Julio de Mesquita Filho", Sao Paulo, Brazil), Ph.D. Internship, 01/03/2024 - 28/02/2025
2. *Synthesis and testing of bio-hybrid polydopamine nanoparticles*. Bengu Sueda Sengul (Sabanci University, Istanbul, Turkey), B.Sc. Internship, 14/06/2021 - 22/08/2021
3. *Preparation, characterization, and in vitro testing of hybrid lipid/polymeric nanoparticles for drug targeting*. Egemen Acar (Sabanci University, Istanbul, Turkey), B.Sc. Internship, 01/07/2019 - 31/08/2019

4. *Altered gravity conditions for the modulation of cellular activities*. Ewelina Lorenc (Jagiellonian University, Krakow, Poland), M.Sc. Internship, 09/07/2018 - 10/09/2018
5. *Preparation and characterization of nanoceria-doped substrates*. Paolo Donati (Università degli Studi di Camerino, Camerino, Italy), Post-Graduate Internship, 14/04/2017 - 16/06/2017
6. *Enhancing far-red and NIR light sensitivity of opsins using chlorophyll derivatives*. Andrea Degl'Innocenti (Max Plank Institute for Biophysics, Frankfurt, Germany), Post-Doctoral Internship, 16/11/2015 - 15/05/2016
7. *Investigation of boron nitride nanotubes applications for cancer therapy*. Tiago Hilario Ferreira (Centro de Desenvolvimento da Tecnologia Nuclear, Belo Horizonte, Brazil), Ph.D. Internship, 18/02/2013 - 17/07/2013

#### Invited talks/seminars

1. *Modulation of cellular activities through biodegradable nano transducers*. Invited seminar at the Aragon Nanoscience and Materials Institute, Zaragoza (Spain); March 12th, 2025
2. *Ultrasound-responsive piezoelectric nanoparticles for remote neuronal activation and differentiation*. Invited talk at the 6th International Brain Stimulation Conference, Kobe (Japan); February 26th, 2025
3. *Advanced platforms for biological testing: Bridging the gap between in vitro and in vivo*. Invited seminar at the Osaka University, Osaka (Japan); February 25th, 2025
4. *Smart nanomaterials as advanced theranostic tools*. Invited on-line lecture at the National School of Nanoscience and Nanotechnology, Algiers (Algeria); February 3rd, 2025
5. *Omics approaches: From cancer research to space nanomedicine*. Invited talk at the IPR International Conference, Awaji (Japan); January 16th, 2025
6. *Piezoelectric nanomaterials in cancer therapy*. Invited lecture at the 3<sup>rd</sup> Workshop & Winter School in BioPhotonics, BioElectronics and BioMechanics (BioCube), Sestriere (Italy); December 12th, 2024
7. *Piezoelectric cellular stimulation: An innovative approach for brain cancer therapy*. Invited key-note talk at the NanoBalkan International Conference, Tirana (Albania); October 29th, 2024
8. *Modulation of the cellular activities through smart nanomaterials*. Invited lecture at the Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro (Brazil); September 26th, 2024
9. *Brain-on-a-chip devices: Real-scale sensorized models*. Invited key-note talk at the 6<sup>th</sup> International Congress on Biosensors, Konya (Turkey); September 7th, 2024
10. *Modulation of the brain cancer microenvironment through piezoelectric nanoparticles*. Invited talk at the Annual Meeting of the Italian Society for Biomaterials (SIB 2014), Faenza (Italy); July 10th, 2024
11. *Piezoelectric nanotransducers for brain cancer therapy and neuronal stimulation*. Invited lecture at the International School of Nanomedicine, 7th Course: "Challenges and Prospects of Nanomedicine for Brain Targeting", Erice (Italy); July 3rd, 2024
12. *Smart nanoparticles and microphysiological systems: Focus on the central nervous system*. Invited seminar at the Department of Life Science and Medical Bioscience, TWIns, Waseda University, Tokyo (Japan); June 6th, 2024
13. *Lipid-based magnetic nanoparticles for glioma treatment: In vivo validation*. Invited talk at the International Union of Radio Science Atlantic Meeting, Gran Canaria (Spain); May 20th, 2024
14. *Tuning cellular functions through smart nanomaterials*. Invited lecture at the Silesian University of Technology, Gliwice (Poland); April 26th, 2024
15. *Combining drug delivery and piezoelectric stimulation for an efficient cancer treatment*. Invited talk at the 17th European Symposium on Controlled Drug Delivery, Egmont aan Zee (The Netherlands); April 10th, 2024
16. *Biomimetic barriers-on-a-chip for the modeling of the brain cancer microenvironment*. Invited digital lecture for the European Organ-on-Chip Society, on-line; March 28th, 2024
17. *Piezoelectric stimulation of immune cells: Implications for brain cancer therapy*. Invited on-line talk at the Global Nanobiotechnology Consortium E-Conference, Tampa (USA); February 2nd, 2024
18. *Active nanomaterials for cancer therapy and manipulation of cellular functions*. Invited seminar at the University of Pavia, Pavia (Italy); December 1st, 2023
19. *Biomimetic nanotechnological antioxidants for space medicine*. Invited talk at the symposium "Medicine and astronauts: Exploring health in space", Roma (Italy); November 24th, 2023
20. *Patient-specific nanovectors against glioblastoma multiforme*. Invited key-note talk at the NanoBio&Med 2023 conference, Barcelona (Spain); November 22nd, 2023

21. *Nanomaterials-mediated manipulation of cellular functions*. Invited webinar at the IEEE Nanotechnology Council - Technical Committee 2 "Nano-Biomedicine" Series, on-line; September 12th, 2023
22. *Real-scale models of the brain cancer microenvironment*. Invited key-note talk at the 33rd Conference of the European Society for Biomaterials, Davos (Switzerland); September 7th, 2023
23. *Lipid-based magnetic nanoparticles for glioma treatment: Towards a personalized approach*. Invited talk at the International Union of Radio Science General Assembly and Scientific Symposium, Sapporo (Japan); August 24th, 2023
24. *Smart nanomaterials: Innovative tools for Earth and space medicine*. Invited plenary lecture at the University "Carlo Bo", Urbino (Italy); June 30th, 2023
25. *Multifunctional nanovectors: Towards the clinical practice*. Invited lecture at the Seasonal School "From minimally invasive surgery to nanorobotics: A voyage in the field of intervention robotics", Pisa (Italy); June 8th, 2023
26. *Biomimetic antioxidant nanomaterials in biomedicine*. Invited talk at the European Materials Research Society Spring Meeting, Strasbourg (France); May 29th, 2023
27. *Nanozymes and space medicine*. Invited seminar at the University of Trento, Trento (Italy); May 10th, 2023
28. *Protection mediated by antioxidant nanotechnology against neuronal damage in space – Introduction to the PROMETEO Project*. Invited seminar at the East Virginia Medical School, Norfolk (USA); November 1st, 2022
29. *Smart nano-heaters tackling brain cancer*. Invited key-note talk at the Trends in Nanotechnology Conference, Tirana (Albania); October 5th, 2022
30. *Remotely-triggered cancer therapy: The role of smart nanoparticles*. Invited key-note talk at the European Microwave Week, Milano (Italy); September 26th, 2022
31. *Nanozymes in biomedicine: Route towards clinical applications*. Invited key-note talk at the 32nd Conference of the European Society for Biomaterials, Bordeaux (France); September 5th, 2022
32. *Where RNA meets nano: The present and the future*. Introductory speech at the international meeting "NanoGagliato", Gagliato (Italy); July 29th, 2022
33. *Grape-derived extracts as potential active pharmaceutical and cosmetic ingredients*. Invited lecture at the workshop "Innovative approaches in cosmetic testing, in compliance with the European regulation", Genova (Italy); June 23rd, 2022
34. *Smart solutions in nanomedicine*. Invited lecture at Università Campus Bio-Medico, Roma (Italy); May 24th, 2022
35. *Pharmaceutics, technologies, and new experimental models*. Invited report at the Italian Space Agency workshop on the Roadmap for Space Life Sciences, Roma (Italy); May 23rd, 2022
36. *Active nanomaterials for advanced biomedical applications*. Invited seminar at the Sant'Anna School of Advanced Studies, Pisa (Italy); February 8th, 2022
37. *Smart nanomaterials in biomedicine*. Invited seminar at the University of Siena, Siena (Italy); January 19th, 2022
38. *Innovative smart nanomaterials towards clinical applications*. Invited lecture at the Unit for Energy and Nanomaterials, Waseda University, Tokyo (Japan); December 17th, 2021
39. *Wireless nanomedicine: The potential of piezoelectric nanomaterials in the clinical practice*. Invited on-line lecture at the BeMAGIC Winter School "Magnetoelectricity in biomedicine: Healthcare for the 21st century", Zurich (Switzerland); November 9th, 2021
40. *Smart nanomaterials for advanced biomedical applications*. Invited key-note talk at the Trends in Nanotechnology Conference, Tirana (Albania); October 6th, 2021
41. *Piezoelectric materials for biomedical applications: From tissue engineering to cancer nanomedicine*. Invited on-line key-note talk at the 31st Conference of the European Society for Biomaterials, Porto (Portugal); September 6th, 2021
42. *Nanotechnology: Successes and opportunities*. Introductory speech at the international meeting "NanoGagliato", Gagliato (Italy); August 28th, 2021
43. *Piezoelectric polymers for biomedical applications: From tissue engineering to cancer nanomedicine*. Invited on-line talk at the Advanced Functional Polymers for Medicine Conference, Pisa (Italy); July 14th, 2021
44. *A new generation of nanovectors tackling brain cancer*. Invited on-line talk at the New Trends in Material Science and Engineering: 1st International Virtual Conference, L'Aquila (Italy); June 16th, 2021
45. *Lipid-based magnetic nanosystems for cancer therapy*. Invited on-line lecture at the Kiel University, Kiel (Germany); June 15th, 2021

46. *Innovative nanotechnological approaches for the treatment of glioblastoma multiforme*. Invited on-line talk at the European Materials Research Society Spring Meeting, Strasbourg (France); May 31st, 2021
47. *Innovative nanomaterials and space medicine*. Invited on-line talk at the workshop "Space factories: Emerging applications on space stations", Tel Aviv (Israel); May 4th, 2021
48. *Piezo-stimulation against cancer: Clinical perspectives*. Invited on-line talk at the Global Nanobiotechnology Consortium E-Conference, Tampa (USA); March 13th, 2021
49. *Stimuli-responsive nanomaterials for biomedical applications*. Invited on-line seminar at the University of Sydney, Sydney (Australia); July 2nd, 2020
50. *Smart bio-interfaces*. Invited talk at the Sino-Italian Science and Technology Innovation Cooperation Matchmaking Meeting, Hangzhou (China) and at the Sino-Italian Meeting for Cooperation on Innovative Trends, Keqiao (China); October 24th-25th, 2019
51. *Multifunctional hybrid nanovectors*. Invited lecture at the XXXVIII Annual School of Bioengineering, Bressanone (Italy); September 10th, 2019
52. *Nano-lessons: Learning from failures*. Introductory speech at the international meeting "NanoGagliato", Gagliato (Italy); July 13th, 2019
53. *Hybrid nanoparticles for the treatment of central nervous system disorders*. Invited lecture at the International School of Nanomedicine, 4th Course: "Precision Nanomedicine", Erice (Italy); July 3rd, 2019
54. *Piezoelectricity applied to tissue engineering: A new approach based on remote cell stimulation*. Invited talk at the TERMIS-EU conference, Rhodes (Greece); May 28th, 2019
55. *Molecular countermeasures to space flight: The case of nano-antioxidants*. Invited lecture at the *Scuola Superiore Sant'Anna*, Pisa (Italy); March 15th, 2019
56. *Hybrid nanostructured materials for advanced biomedical applications*. Invited seminar at the Osaka University, Osaka (Japan); February 22nd, 2019
57. *Smart nanomedicine*. Invited seminar at the Eindhoven University of Technology, Eindhoven (The Netherlands); November 30th, 2018
58. *Hybrid nanocarriers for theranostic applications*. Invited seminar at the Sabanci University, Istanbul (Turkey); November 21st, 2018
59. *Piezoelectric effects of nanomaterials on bio-interfaces*. Invited talk at OrbItaly 2018, Milano (Italy); October 17th, 2018
60. *Smart nanomaterials for biomedical applications: From Earth to space*. Invited talk at the NanoInnovation Conference & Exhibition, Roma (Italy); September 14th, 2018
61. *Nanoparticle-assisted remote electric stimulation inhibits glioblastoma multiforme cell proliferation*. Invited talk at the European Advanced Materials Congress, Stockholm (Sweden); August 23th, 2018
62. *Smart nanomaterials for the control of biological functions*. Invited seminar at the National University of Ireland, Galway (Ireland); July 13th, 2018
63. *Control of biological functions mediated by nanostructured materials*. Invited lectures at the *Università Cattolica del Sacro Cuore*, Brescia (Italy); May 14th-15th, 2018
64. *Piezoelectric nanostructured materials as innovative smart bio-interfaces*. Invited talk at the Materials Research Society Spring Meeting, Phoenix (USA); April 5th, 2018
65. *Multifunctional hybrid nanovectors: A new tool to overcome highly invasive tumor resistance*. Invited talk at the 29th Conference of the International Society for Medical Innovation and Technology, Torino (Italy); November 10th, 2017
66. *Lipid-based hybrid nanovectors as theranostic tools*. Invited talk at the East-West Chemistry Conference, Skopje (Macedonia); October 12th, 2017
67. *Bioapplications of smart ceramic nanoparticles*. Invited talk at the Clusters & Nanostructures Gordon Research Conference, South Hadley (USA); July 12th, 2017
68. *Remote control of cellular functions mediated by smart nanomaterials*. Invited key-note talk at the workshop "NanoBioMed Sardinia", Alghero (Italy); June 25th, 2017
69. *Smart materials in nanomedicine*. Invited talk at the NanoBio&Med 2016 conference, Barcelona (Spain); November 24th, 2016
70. *Piezoelectric nanomaterials for tissue engineering*. Invited talk at the 1st Biennial Conference on Biomaterials for Tissue and Genetic Engineering and the Role of Nanotechnology (BioMaH), Roma (Italy); October 18th, 2016

71. *Active nanomaterials for biomedical applications*. Invited talk at the conference “Nanotechnology in medicine: From molecules to humans”, Herrnstain (Austria); July 6th, 2016
72. *Smart substrates for tissue engineering*. Invited seminar at the Department of Materials, Loughborough University, Loughborough (UK); June 17th, 2016
73. *Piezoelectric nanomaterials for cell stimulation*. Invited seminar at the Department of Life Science and Medical Bioscience, TWIns, Waseda University, Tokyo (Japan); May 17th, 2016
74. *Potential applications of smart nanoparticles in neurodegenerative diseases*. Invited talk at the workshop “Engineered biomaterials and biomedical devices in the regenerative medicine of the nervous system”, Torino (Italy); November 20th, 2015
75. *Modulation of cellular responses: The two-photon polymerization approach in the control of the physical micro/nanoenvironment*. Invited talk at the 37th Annual International Conference of the IEEE EMBS, Milano (Italy); August 26th, 2015
76. *Multi-functional nanomaterials for cancer therapy*. Invited talk at the European Materials Research Society Spring Meeting, Lille (France); May 14th, 2015
77. *Hypergravity to investigate cell differentiation*. Invited talk at the workshop “Biology in Space: Challenges and Opportunities”, Pisa (Italy); November 7th, 2014
78. *Boron nitride nanotubes in the biomedical research*. Invited talk at the 10th Nanoscience and Nanotechnology Conference, Istanbul (Turkey); June 20th, 2014
79. *Nanotransducers for biomedical applications: The example of boron nitride nanotubes*. Invited talk at the Energy Materials and Nanotechnology Spring Meeting, Las Vegas (USA); March 2nd, 2014
80. *Piezoelectric nanostructured scaffolds for regenerative medicine*. Invited talk at the Materials Research Society Spring Meeting, San Francisco (USA); April 5th, 2013
81. *Piezoelectric nanomaterials for biomedical applications*. Invited lecture at the symposium “Piezoelectric bone surgery”, Torino (Italy); March 9th, 2013
82. *Piezoelectric quasi-1D nanostructures for biomedical applications*. Invited lecture at the symposium “Piezoelectric nanodevices: Present and future”, *Accademia Nazionale dei Lincei*, Roma (Italy); September 28th, 2012
83. *Smart nanoparticles in the biomedical research*. Invited lecture at the Spring Conference of the *Europäische Akademie Bad Neuenahr-Ahrweiler* “Nanomedicine. Visions, risks, potential”, Berlin (Germany); April 19th, 2012
84. *Applications of ceramic nanoparticles in nanomedicine*. Invited talk at the International Conference on Processing and Manufacturing of Advanced Materials (THERMEC 2011), Quebec City (Canada); August 4th, 2011
85. *Nanoparticles for biomedical applications, with a special view on boron nitride nanotubes*. Invited seminar at the World Premier International Research Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba (Japan); November 10th, 2009

#### Invited dissemination talks

1. *Nanomedicina & Spazio*. Invited lecture at *Scuola Media “A. Frank”*, Pistoia (Italy); February 5th, 2025
2. *Nanomedicina in orbita: Contrastare lo stress ossidativo mediante nanomateriali intelligenti*. Invited round-table speech at the symposium *La Vocazione Duale della Medicina Aeronautica*, Genova (Italy); October 1st, 2024
3. *Il progetto CyberNano: Nanomedicina personalizzata contro il glioma*. Invited seminar at Bientina Municipality, Bientina (Italy); September 6th, 2024
4. *Nanotecnologie per medicina spaziale (ma non solo)*. Invited lecture at *Scuola Media “I. Masih”*, Bientina (Italy); February 22nd, 2024
5. *Nanomedicina: Dalla Terra allo Spazio*. Invited seminar at Bientina Municipality, Bientina (Italy); September 29th, 2023
6. *Costa Ligure e ricerca biomedica: Studio ed applicazioni delle molecole antiossidanti dell’uva*. Invited talk at the *SeaTalk*, La Spezia (Italy); June 10th, 2023
7. *Nanomedicina spaziale*. Invited lecture at *Istituto Superiore “G. Falcone”*, Loano (Italy); January 24th, 2023
8. *Antiossidanti tradizionali ed innovativi: Possibili applicazioni per la salute dell’astronauta*. Invited talk at the *Festival dello Spazio*, Busalla (Italy); July 2nd, 2022

9. *Scienza ed innovazione sul territorio: I centri dell'Istituto Italiano di Tecnologia della Provincia di Pisa*. Invited talk at *Cascina Europa*, Cascina (Italy); June 22nd, 2022
10. *AIRC nelle Scuole: CyberNano*. Invited lecture at *Scuola Media "F. Sacchetti"*, San Miniato (Italy); March 23rd, 2022
11. *Onde di energia per la stimolazione di nanomateriali intelligenti*. Invited on-line talk at the *Festival della Scienza*, Genova (Italy); October 26th, 2020
12. *La medicina del futuro: Dalla Terra allo Spazio*. Invited talk at *Monterosso un Mare di Libri*, Monterosso al Mare (Italy); July 30th, 2020
13. *NANOROS: Risultati della ricerca sulla stazione spaziale*. Invited talk at the *Festival dello Spazio*, Busalla (Italy); July 28th, 2019
14. *Antiossidanti nanotecnologici dalla Terra allo Spazio*. Invited talk at *Serate Scientifiche Lungarno con l'Istituto Italiano di Tecnologia*, Pisa (Italy); July 22nd, 2019
15. *SLaMM - Magnetic solid lipid nanoparticles as a multifunctional platform against glioblastoma multiforme*. Invited talk at the "BeERC" event 2018, Genova (Italy); December 3rd, 2018
16. *NANOROS: Tecnologie in orbita*. Invited talk at the *Festival della Scienza*, Genova (Italy); November 5th, 2017
17. *Nanomateriali intelligenti e loro applicazioni in biomedicina*. Invited talk at the *Accademia del Gusto di La Spezia*, Ameglia (Italy); September 28th, 2017
18. *NANOROS: Nanotechnology solutions against oxidative stress in muscle tissue during long-term microgravity exposure*. Invited talk at the *Festival dello Spazio*, Busalla (Italy); July 27th, 2017
19. *SLaMM - Magnetic solid lipid nanoparticles as a multifunctional platform against glioblastoma multiforme*. Invited talk at the "BeERC" event 2017, Genova (Italy); March 16th, 2017

#### Other talks/seminars

1. *Piezoelectric stimulation of microglia as an innovative approach for glioma immunotherapy*. Talk at the 12th World Biomaterials Congress, Daegu (South Korea); May 28th, 2024
2. *Innovative antioxidant therapies for space medicine*. Talk at the 74th International Astronautical Conference, Baku (Azerbaijan); October 6th, 2023
3. *Polydopamine nanoparticles as versatile and smart nanotechnological antioxidant agents*. Talk at the 8th Nano Today Conference, San Diego (USA); April 25th, 2023
4. *Innovative antioxidant therapies for space medicine*. Talk at the ASI Symposium "Space biomedicine for the future human space exploration missions: A call to action", Roma (Italy); March 16th, 2023
5. *Piezoelectric materials and cancer nanomedicine*. Talk at the "Bio-Nano International Workshop", on-line; September 29th, 2021
6. *Smart nanomaterials: The route towards clinical applications*. Key-note talk at the "Bio-Nano Cross-Over International Workshop", on-line; May 25th, 2021
7. *Hybrid magnetic/lipid nanovectors for brain cancer therapy*. Talk at the 6th Nano Today Conference, Lisbon (Portugal); June 19th, 2019
8. *Multifunctional hybrid nanovectors for brain drug delivery*. Talk at the 5th Core-to-Core International Symposium "3D Lab-Exchange Program", Okinawa (Japan); February 26th, 2019
9. *Innovative smart nanomaterials for brain cancer therapy*. Talk at the 14th International Conference on Nanostructured Materials, Hong Kong (China); June 25th, 2018
10. *Smart nanotools for the development of multifunctional biomedical platforms*. Talk at the 4th Core-to-Core International Symposium "3D Lab-Exchange Program", Bonn (Germany); March 8th, 2018
11. *Remote modulation of cell activities mediated by smart nanoparticles*. Talk at the 5th Nano Today Conference, Waikoloa (USA); December 10th, 2017
12. *Lipid-based hybrid theranostic nanovectors for brain cancer treatment*. Talk at the 28th Conference of the European Society for Biomaterials, Athens (Greece); September 8th, 2017
13. *Remote nanomaterials-mediated cell activation*. Talk at the 5th International Conference on Multifunctional, Hybrid and Nanomaterials, Lisbon (Portugal); March 6th, 2017
14. *Smart bio-nanomaterials*. Talk at the 3rd Core-to-Core International Symposium "3D Lab-Exchange Program", Pisa (Italy); September 22nd, 2016
15. *Boron nitride nanotubes as smart biomaterials*. Talk at the 13th International Conference on Nanostructured Materials, Quebec City (Canada); August 9th, 2016



16. *Nanoparticle-assisted piezoelectric cell stimulation*. Lecture at the University of Genova, Genova (Italy); April 29th, 2016
17. *Smart multi-functional nanomaterials for biomedical applications*. Talk at the 4th Nano Today Conference, Dubai (UAE); December 9th, 2015
18. *Two-photon polymerization of Ormocomp® 3D structures doped with piezoelectric barium titanate nanoparticles*. Talk at the 27th Conference of the European Society for Biomaterials, Krakow (Poland); September 3rd, 2015
19. *Targeted delivery of anti-cancer drug sorafenib through magnetic solid lipid nanoparticles*. Talk at the TechConnect World Innovation Conference & Expo, National Harbor (USA); June 15th, 2015
20. *Nanotechnology-based smart bio-interfaces*. Lecture at the *Politecnico di Torino*, Torino (Italy); April 22nd, 2015
21. *Smart bio-interfaces*. Talk at the 1st Core-to-Core International Symposium "3D Lab-Exchange Program", Kamagawa (Japan); September 12th, 2014
22. *Smart nanostructured materials in the biomedical research*. Talk at the 12th International Conference on Nanostructured Materials, Moscow (Russia); July 14th, 2014
23. *Recombinant human elastin-like magnetic microparticles for drug delivery and targeting*. Talk at the 4th International Symposium on Surface and Interface of Biomaterials, Roma (Italy); September 25th, 2013
24. *Smart nanomaterials for biomedical applications*. Seminar at the Department of Life Science and Medical Bioscience, TWIns, Waseda University, Tokyo (Japan); May 14th, 2013
25. *Myoblast behavior on human recombinant elastin-like coatings*. Talk at the conference Nanomedicine: From molecules to diagnosis and therapy, Roma (Italy); October 2nd, 2012
26. *Boron nitride nanotubes for biological and medical applications*. Talk at the 13th International Conference on the Science and Application of Nanotubes, Brisbane (Australia); June 28th, 2012
27. *In vivo preliminary investigation of boron nitride nanotubes compatibility*. Talk at the 9th World Biomaterials Congress, Chengdu (China); June 3rd, 2012
28. *Hypergravity effects on proliferation and differentiation of C2C12 muscle-like cells*. Talk at the 62nd International Astronautical Conference, Cape Town (South Africa); October 7th, 2011
29. *Adhesion and proliferation of PC12 cells on ZnO nanowire arrays*. Talk at the Annual Meeting of the Italian Society for Biomaterials (SIB 2011), Bari (Italy); May 24th, 2011
30. *Potential applications of barium titanate nanoparticles in nanomedicine: A preliminary study*. Talk at the 10th Nanotechnology Conference: IEEE NANO 2010, Seoul (Korea); August 18th, 2010
31. *BioNanoRobotics: How nano can we go?* Seminar at the Department of Nanomedicine and Biomedical Engineering of the University of Texas, Houston (USA); February 11th, 2010
32. *Piezoelectric nanotubes for cellular stimulation*. Talk at the 1st ASME Global Congress on NanoEngineering for Medicine and Biology, Houston (USA); February 9th, 2010
33. *Potential biomedical applications of boron nitride nanotubes, with special attention on boron neutron capture therapy*. Seminar at the annual meeting of the Italian-Switzerland Society of Biomedical and Chemical Sciences, Bellinzona (Switzerland); November 27th, 2009
34. *Boron nitride nanotubes as innovative biomaterials*. Talk at the 2nd WUT-NIMS-EMPA Workshop on Nanomaterials for sustainable Development, Tsukuba (Japan); November 12th, 2009
35. *Boron nitride nanotubes as innovative vectors for cell therapy*. Seminar at the Department of Life Science and Medical Bioscience, Waseda University, Tokyo (Japan); September 24th, 2009
36. *Investigation of interactions between boron nitride nanotubes and C2C12 cells*. Talk at the 9th Nanotechnology Conference: IEEE NANO 2009, Genova (Italy); July 29th, 2009
37. *Magnetic driven drug targeting*. Talk at the 2nd European Summer School in Nanomedicine, Cascais, Lisbon (Portugal); June 15th, 2009
38. *Cell cultures and nanotechnology: Towards the medicine of the future*. Talk at the AICC annual meeting, *Istituti Ortopedici Rizzoli*, Bologna (Italy); November 27th, 2008
39. *Study and design of drug delivery systems for cell therapy*. Micro Nano COE special seminar, School of Engineering, Nagoya University, Nagoya (Japan); November 21st, 2007
40. *Polymeric micro- and nanoparticles as drug delivery systems for cell therapy*. Seminar at the Consolidated Research Institute for Advanced Science and Medical Care (ASMEW), Waseda University, Tokyo (Japan); October 24th, 2007

## Awards and other achievements

- Stanford University's list of "World's Top 2%" scientists (2020 - present)
- "Special recognition" awarded by Bientina Municipality (Pisa, Italy) on September 23rd, 2023
- Knight of the Order of Merit of the Italian Republic, appointed by the President of the Italian Republic on December 27th, 2022
- "Premio Sciacchetrà 2022", awarded by "Associazione Amici delle Cinque Terre"
- Cover image of: *Small Science* 5(2), 2025; *Advanced Healthcare Materials* 14(2), 2025; *Lab on a Chip* 24(22), 2024; *Advanced Intelligent Systems* 6(9), 2024; *APL Bioengineering* 7(3), 2023; *Advanced Healthcare Materials* 12(19), 2023; *Biomaterials Science* 9(24), 2021; *Advanced Materials Interfaces* 8(21), 2021; *Journal of Biomedical Materials Research A* 109(11), 2021; *Macromolecular Bioscience* 21(9), 2021; *Advanced Materials Technologies* 5(10), 2020; *ACS Applied Materials and Interfaces* 12(26), 2020; *ACS Omega* 5(21), 2020; *Advanced Materials Technologies* 5(3), 2020; *ACS Biomaterials Science and Engineering* 5(2), 2019; *Nanoscale* 11(1), 2019; *Small* 14(6), 2018; *Advanced Healthcare Materials* 6(9), 2017; *Advanced Healthcare Materials* 4(11), 2015; *Nanoscale* 7(7), 2015; *Pharmaceutical Research* 31(11), 2014; *Macromolecular Bioscience* 14(5), 2014; *Journal of Bioscience and Bioengineering* 114(1), 2012
- International Association for Advanced Materials (IAAM) 2018 Scientist Medal
- Winner of the "Spin Your Thesis!" Campaign, promoted by the ESA, presenting the experiments: *Hypergravity-induced oxidative stress in planarians: Nanotechnology-based countermeasures* (2016); *Implementation of hypergravity in mammalian cell transfection procedures* (2014); *Combination of hypergravity and nanotechnology for the improvement of the differentiation of mesenchymal stem cells into osteoblasts* (2013); *Investigation of hypergravity on proliferation, metabolism and differentiation of muscle cells* (2010)
- European Biomaterials and Tissue Engineering Doctoral Award (EDA) 2011
- "Nital I-Robot - Scuola Superiore Sant'Anna" 2010 award for the Ph.D. Thesis
- "Massimo Grattarola" 2010 award for the Ph.D. Thesis
- Winner of the "Salvatore Venuta" 2010 scholarship for young researchers in nanomedicine
- STSBC-Roche 2009 award (Italian-Switzerland Society of Biomedical and Chemical Sciences and Roche Diagnostics Ltd.) for researches in the fields of biomedicine and/or biotechnology
- Excellent Paper Award 2009 of the Society for Biotechnology of Japan, with the paper *Bi-compartmental device for dynamic cell co-culture: Design, realisation and preliminary results* (*Journal of Bioscience and Bioengineering*, 105(5): 536-544, 2008)
- AICC 2008 award (Italian Cell Culture Association, national branch of the European Tissue Culture Society) for young researchers in the biomedical field
- ISIB-CNR 2006 award (Institute of Biomedical Engineering, National Research Council) for the M.Sc. Thesis
- Winner of the 8th Parabolic Flight Campaign (2005), promoted by the ESA and NOVESPACE, presenting the experiment *Verification of the Fitts' law in microgravity and hypergravity environment and energetic considerations*

## Publication list

### International journals

1. Genchi G.G., Conci C., Sen O., Nardini A., Bartolucci M., Marino A., Martinez-Vasquez R., Cerullo G., Osellame R., Petretto A., Raimondi M.T., Ciofani G. Two-photon polymerization of miniaturized 3D scaffolds optimized for studies on glioblastoma multiforme in spaceflight-like microgravity conditions. *Biofabrication*, 17(2): 025024 (2025)
2. Battaglini M., Carmignani A., Zinovie Ciobanu D., Marino A., Catalano F., Armirotti A., Ciofani G. Detailed profiling of protein corona formed by polydopamine nanoparticles in human plasma. *ACS Applied Materials and Interfaces*, 17(7): 10485-10498 (2025)
3. Barger A., Battaglini M., Curiale T., Carmignani A., Montorsi M., Labardi M., Pucci C., Marino A., Ciofani G. Ultrasound-responsive polymeric piezoelectric nanoparticles for remote activation and neuronal differentiation of human neural stem cells. *Small Science*, 5(2): 2400354 (2025)

4. Pucci C., De Pasquale D., Degl'Innocenti A., Montorsi M., Desii A., Pero M., Martinelli M., Bartolucci M., Petretto A., Ciofani G. Chlorin e6-loaded nanostructured lipid carriers targeted by angiopep-2: Advancing photodynamic therapy in glioblastoma. *Advanced Healthcare Materials*, 14(2): 2402823 (2025)
5. Sankaran S.T., Dallinger A., Bressi A.C., Marino A., Ciofani G., Szkudlarek A., Bilovol V., Sokolowski K., Kunert B., Hampel H.K., Gomez Bernal H., Greco F. From corn starch to nanostructured magnetic laser-induced graphene nanocomposite. *Small*, 20(52): 2405252 (2024)
6. Ceccarelli M.C., Lefevre M.C., Marino A., Pignatelli F., Krukiewicz K., Battaglini M., Ciofani G. Real-time monitoring of a 3D blood-brain barrier model maturation and integrity with a sensorized microfluidic device. *Lab on a Chip*, 24(22): 5085-5100 (2024)
7. Aparicio-Blanco J., Pucci C., De Pasquale D., Marino A., Debellis D., Ciofani G. Development and characterization of lipid nanocapsules loaded with iron oxide nanoparticles for magnetic targeting to the blood-brain barrier. *Drug Delivery and Translational Research*, 14(12): 3494-3511 (2024)
8. De Pasquale D., Marino A., Pucci C., Tricinci O., Filippeschi C., Fiaschi P., Sinibaldi E., Ciofani G. Remotely controlled 3D-engineered scaffolds for biomimetic *in vitro* investigations on brain cell co-cultures. *Advanced Intelligent Systems*, 6(9): 2400261 (2024)
9. Emanet M., Lefevre M.C., Ceccarelli M.C., Battaglini M., Carmignani A., Schiavone F., Marino A., De Pasquale D., Prato M., De Boni F., Petretto A., Bartolucci M., Catalano F., Moscato S., Ciofani G. Polydopamine nanoparticles-based combined chemotherapy and photothermal therapy for the treatment of liver cancer. *ACS Applied Materials and Interfaces*, 16(31): 40311-41720 (2024)
10. Sen O., Armanetti P., Carmignani A., Catalano F., Pugliese G., Menichetti L., Ciofani G. Photoacoustic features of nylon-11 nanoparticles for breast cancer imaging, and their modification with trastuzumab, sorafenib, and nutlin-3a for theranostic applications. *Nano Trends*, 7: 100047 (2024)
11. Montorsi M., Pucci C., De Pasquale D., Marino A., Ceccarelli M.C., Mazzuferi M., Bartolucci M., Petretto A., Prato M., Debellis D., De Simoni G., Pugliese G., Labardi M., Ciofani G. Ultrasound-activated piezoelectric nanoparticles trigger microglia activity against glioblastoma cells. *Advanced Healthcare Materials*, 13(18): 2304331 (2024)
12. Battaglini M., Marino A., Montorsi M., Carmignani A., Ceccarelli M.C., Ciofani G. Nanomaterials as microglia modulators in the treatment of central nervous system disorders. *Advanced Healthcare Materials*, 13(12): 2304180 (2024)
13. Degl'Innocenti A., Braccia C., Genchi G.G., di Leo N., Leoncino L., Catalano F., Armirotti A., Ciofani G. Proteome alterations and nucleosome activation in rat myoblasts treated with cerium oxide nanoparticles. *ACS Omega*, 9(27): 29226-29233 (2024)
14. Marino A., Bargerò A., Ciofani G. Piezoelectric nanomaterials: Latest applications in biomedicine and challenges in clinical translation. *Nanomedicine UK*, 19(12): 1029-1034 (2024)
15. Willis R.C.W., Calvaruso M., Angeloni D., Baatout S., Benchoua A., Bereiter-Hahn J., Bottai D., Buchheim J., Carnero-Diaz E., Castiglioni S., Cavalieri D., Ceccarelli G., Chouker A., Cialdai F., Ciofani G., Coppola G., Cusella G., Degl'Innocenti A., Desaphy J.F., Fripiat J.P., Gelinsky M., Genchi G.G., Grano G., Grimm F., Guignandon A., Herranz R., Hellweg C., Iorio C.S., Karapantsios T., van Loon J.J.W.A., Lulli M., Maier J., Malda J., Mamaca E., Morbidelli L., Osterman A., Ovsianikov A., Pampaloni F., Lorie E.P., Pereda-Loth V., Przybyla C., Rettberg P., Rizzo A., Robson-Brown K., Rossi L., Russo G., Salvetti A., Risaliti C., Santucci D., Sperl M., Tabury K., Tavella S., Thielemann C., Willaert R., Monici M., Szewczyk N.J. How to obtain an integrated picture of the molecular networks involved in adaptation to microgravity in different biological systems? *NPJ Microgravity*, 10: 50 (2024)
16. Carmignani A., Battaglini M., Marino A., Pignatelli F., Ciofani G. Drug-loaded polydopamine nanoparticles for chemo/photothermal therapy against colorectal cancer cells. *ACS Applied Bio Materials*, 7(4): 2205-2217 (2024)
17. Carmignani A., Battaglini M., Bartolucci M., Petretto A., Prato M., Ciofani G. Polydopamine nanoparticles as a non-pharmaceutical tool in the treatment of fatty liver disease. *Materials and Design*, 239: 112825 (2024)
18. Davis T., Tabury K., Zhu S., Angeloni D., Baatout S., Benchoua A., Bereiter-Hahn J., Bottai D., Buchheim J.I., Calvaruso M., Carnero-Diaz E., Castiglioni S., Cavalieri D., Ceccarelli G., Choukér A., Cialdai F., Ciofani G., Coppola G., Cusella G., Degl'Innocenti A., Desaphy J.F., Fripiat J.P., Gelinsky M., Genchi G.G., Grano M., Grimm D., Guignandon A., Hahn C., Hatton J., Herranz R., Hellweg C.E., Iorio C.S., Karapantsios T., van Loon J.J.W.A., Lulli M., Maier J., Malda J., Mamaca E., Morbidelli L., van Ombergen A., Osterman A., Ovsianikov A., Pampaloni F., Pavezlorie E., Pereda-Campos V., Przybyla C., Puhl C., Rettberg P., Rizzo A.M. Robson-Brown

- K., Rossi L., Russo G., Salvetti A., Santucci D., Sperl M., Tavella S., Thielemann C., Willaert R., Szewczyk N., Monici M. How are cell and tissue structure and function influenced by gravity and what are the gravity perception mechanisms? *NPJ Microgravity*, 10: 16 (2024)
19. Battaglini M., Emanet M., Carmignani A., Ciofani G. Polydopamine-based nanostructures: A new generation of versatile, multi-tasking, and smart theranostic tools. *Nano Today*, 55: 102151 (2024)
  20. Sen O., Emanet M., Mazzuferi M., Bartolucci M., Catalano F., Prato M., Moscato S., Marino A., De Pasquale D., Pugliese G., Bonaccorso F., Pellegrini V., del Rio Castillo A.E., Petretto A., Ciofani G. Microglia polarization and anti-glioma effects fostered by dual cell membrane-coated doxorubicin-loaded hexagonal boron nitride nanoflakes. *ACS Applied Materials and Interfaces*, 15(50): 58260-58273 (2023)
  21. Ciofani G., Monopoli M.P. Insights in nanobiotechnology 2022/2023: Novel developments, current challenges, and future perspectives. *Frontiers in Bioengineering and Biotechnology*, 11: 1331760 (2023)
  22. Cialdai F., Brown A.M., Baumann C.W., Angeloni D., Baatout S., Benchoua A., Bereiter-Hahn J., Bottai D., Buchheim J.I., Calvaruso M., Carnero-Diaz E., Castiglioni S., Cavalieri D., Ceccarelli G., Chouker A., Ciofani G., Coppola G., Cusella G., Degl'Innocenti A., Desaphy J.F., Fripiat J.P., Gelinsky M., Genchi G.G., Grano M., Grimm D., Guignandon A., Hahn C., Hatton J., Herranz R., Hellweg C.E., Iorio C.S., Karapantsios T., van Loon J.J.W.A., Lulli M., Maier J., Malda J., Mamaca E., Morbidelli L., van Ombergen A., Osterman A., Ovsianikov A., Pampaloni F., Pavezlorie E., Pereda-Campos V., Przybyla C., Puhl C., Rettberg P., Risaliti C., Rizzo A.M., Robson-Brown K., Rossi L., Russo G., Salvetti A., Santucci D., Sperl M., Strollo F., Tabury K., Tavella S., Thielemann C., Willaert R., Szewczyk N.J., Monici M. How do gravity alterations affect animal and human systems at a cellular/tissue level? *NPJ Microgravity*, 9: 84 (2023)
  23. Emanet M., Ciofani G. Ethosomes as promising transdermal delivery systems of natural-derived active compounds. *Advanced NanoBiomed Research*, 3(10): 2300020 (2023)
  24. Marino A., Battaglini M., Lefevre M.C., Ceccarelli M.C., Ziaja K., Ciofani G. Sensorization of microfluidic brain-on-a-chip devices: Towards a new generation of integrated drug screening systems. *Trends in Analytical Chemistry*, 168: 117319 (2023)
  25. Beola L., Iturrioz-Rodríguez N., Pucci C., Bertorelli R., Ciofani G. Drug-loaded lipid magnetic nanoparticles for combined local hyperthermia and chemotherapy against glioblastoma multiforme. *ACS Nano*, 17(18): 18441-18455 (2023)
  26. De Pasquale D., Pucci C., Desii A., Marino A., Debellis D., Leoncino L., Prato M., Moscato S., Amadio S., Fiaschi P., Prior A., Ciofani G. A novel patient-personalized nanovector based on homotypic recognition and magnetic hyperthermia for an efficient treatment of glioblastoma multiforme. *Advanced Healthcare Materials*, 12(19): 2203120 (2023)
  27. Marino A., Battaglini M., Carmignani A., Pignatelli F., De Pasquale D., Tricinci O., Ciofani G. Magnetic self-assembly of 3D multicellular microscaffolds: A biomimetic brain tumor-on-a-chip for drug delivery and selectivity testing. *APL Bioengineering*, 7(3): 036103 (2023); featured by *Scilight* 2023(30): 301102 (2023)
  28. Nica V., Marino A., Pucci C., Ozlem S., Emanet M., De Pasquale D., Carmignani A., Petretto A., Bartolucci M., Lauciello S., Brescia R., De Boni F., Prato M., Marras S., Drago F., Hammad M., Segets D., Ciofani G. Cell membrane-coated and cell-penetrating peptide-conjugated trimagnetic nanoparticles for targeted magnetic hyperthermia of prostate cancer cells. *ACS Applied Materials and Interfaces*, 15(25): 30008-30028 (2023)
  29. Genchi G.G., Mollo V., Battaglini M., Belenli Gumus M., Marino A., Prato M., Marras S., Drago F., Pugliese G., Santoro F., Ciofani G. Effects of simulated microgravity on the internalization of cerium oxide nanoparticles by proliferating human skeletal myoblasts. *ACS Applied Nano Materials*, 6(12): 10853-10862 (2023)
  30. Polo Y., Luzuriaga J., Gonzalez de Langarica Gutierrez S., Pardo-Rodríguez B., Martínez-Tong D., Tapeinos C., Manero-Roig I., Marin E., Munoz-Ugartemendia J., Ciofani G., Ibarretxe G., Unda F., Sarasua J.R., Pineda J.R., Larranaga A. Self-assembled three-dimensional hydrogels based on graphene derivatives and cerium oxide nanoparticles: Scaffolds for co-culture of oligodendrocytes and neurons derived from neural stem cells. *Nanoscale*, 15(9): 4488-4505 (2023)
  31. Ciofani G., Campisi M., Mattu C., Kamm R.D., Chiono V., Moothedathu Raynold A.A., Freitas J.S., Redolfi Riva E., Micera S., Pucci C., Novio F., Lorenzo J., Ruiz-Molina D., Sierrri G., Re F., Wunderlich H., Kumari P., Kozielski K.L., Chami M., Marino A., Ferreira L. Roadmap on nanomedicine for the central nervous system. *Journal of Physics: Materials*, 6(2): 022501 (2023)

32. Emanet M., Okuda M., Sen O., Lavarello C., Petretto A., Takeoka S., Ciofani G. Sumac (*Rhus coriaria*) extract-loaded polymeric nanosheets efficiently protect human dermal fibroblasts from oxidative stress. *ACS Applied Bio Materials*, 5(12): 5901-5910 (2022)
33. Battaglini M., Feiner N., Tapeinos C., De Pasquale D., Pucci C., Marino A., Bartolucci M., Petretto A., Albertazzi L., Ciofani G. Combining confocal microscopy, dSTORM, and mass spectroscopy to unveil the evolution of the protein corona associated with nanostructured lipid carriers during blood-brain barrier crossing. *Nanoscale* 14(36): 13292-13307 (2022)
34. Marino A., Battaglini M., Tapeinos C., Larranaga A., Ciofani G. Innovative nanotechnology tools for the functional control and tracking of human stem cells. *Materials Today Advances*, 16C: 100298 (2022)
35. Emanet M., Sen O., Pignatelli F., Lavarello C., Petretto A., Ciofani G. Hazelnut extract-loaded nanostructured lipid carriers and evaluation of their antioxidant properties. *Frontiers in Bioengineering and Biotechnology*, 10: 953867 (2022)
36. Marino A., Battaglini M., Moles N., Ciofani G. Natural antioxidant compounds as potential pharmaceutical tools against neurodegenerative diseases. *ACS Omega*, 7(30): 25974-25990 (2022)
37. Battaglini M., Carmignani A., Martinelli C., Colica J., Marino A., Doccini S., Mollo V., Santoro F., Bartolucci M., Petretto A., Santorelli F.M., Ciofani G. *In vitro* study of polydopamine nanoparticles as protective antioxidant agents in fibroblasts derived from ARSACS patients. *Biomaterials Science*, 10(14): 3770-3792 (2022)
38. Egil A.C., Carmignani A., Battaglini M., Sueda Sengul B., Acar E., Ciofani G., Ozaydin Ince G. Dual stimuli-responsive nanocarriers *via* a facile batch emulsion method for controlled release of Rose Bengal. *Journal of Drug Delivery Science and Technology*, 74: 103547 (2022)
39. Del Turco S., Cappello V., Tapeinos C., Moscardini A., Sabatino L., Battaglini M., Melandro F., Torri F., Martinelli C., Babboni S., Silvestrini B., Morganti R., Gemmi M., De Simone P., Martins P., Crocetti L., Peris A., Campani D., Basta G., Ciofani G., Ghinolfi D. Cerium oxide nanoparticles administration during machine perfusion of discarded human livers: A pilot study. *Liver Transplantation*, 28(7): 1173-1185 (2022)
40. Montorsi M., Genchi G.G., De Pasquale D., De Simoni G., Sinibaldi E., Ciofani G. Design, fabrication, and characterization of a multimodal reconfigurable bioreactor for bone tissue engineering. *Biotechnology and Bioengineering*, 119(7): 1965-1979 (2022)
41. Pucci C., Degl'Innocenti A., Belenli Gumus M., Ciofani G. Superparamagnetic iron oxide nanoparticles for magnetic hyperthermia: Recent advancements, molecular effects, and future directions in the omics era. *Biomaterials Science*, 10(9): 2103-2121 (2022); featured among the most popular articles published in the journal during 2022
42. Pucci C., Martinelli C., De Pasquale D., Battaglini M., di Leo N., Degl'Innocenti A., Belenli Gumus M., Drago F., Ciofani G. Tannic acid-iron complex-based nanoparticles as a novel tool against oxidative stress. *ACS Applied Materials and Interfaces*, 14(14): 15927-15941 (2022)
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