

Curriculum vitae di Paola Occhetta

Sotto settori ERC primari (max 3): *PE8_13 Industrial bioengineering; LS3_7 Mechanobiology of cells, tissues and organs; LS9_1 Bioengineering of cells, tissues, organs and organisms*

PERSONAL DETAILS

Family name, First name: Occhetta, Paola

Birthdate: 26/04/1987

Researcher unique identifier(s) (such as ORCID, Research ID, etc. ...):

ORCID: <https://orcid.org/0000-0002-5758-2019>;

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=55830511600>;

ResearcherID: V-3691-2019

URL for web site: <https://mimic-224a25.pages.gitlab.polimi.it/>; www.biomimx.com

• Education and key qualifications

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|------------|--|
| 05/03/2015 | PhD in Bioengineering
Department of Electronics, Information and Bioengineering, Politecnico di Milano, Italy
Supervisors: Prof. Alberto Redaelli, Prof. Marco Rasponi |
| 2011 | Master in Biomedical Engineering
Department of Electronics, Information and Bioengineering, Politecnico di Milano, Italy |
| 2009 | Bachelor in Biomedical Engineering
Department of Electronics, Information and Bioengineering, Politecnico di Milano, Italy |

• Current position(s)

- | | |
|----------|---|
| 2025-now | Associate Professor
Department of Electronics, Information and Bioengineering (DEIB) of Politecnico di Milano (Italy) |
| 2017-now | CEO and co-founder
BiomimX S.r.l., Italy |

• Previous position(s)

- | | |
|-----------|--|
| 2023-2025 | Assistant Professor with tenure position (RTDb) with project lead (ERC Starting Grant and Cariplo Foundation Grant) at Electronics, Information and Bioengineering Department (DEIB) of Politecnico di Milano (Italy) |
| 2022-2023 | Assistant Professor (RTDa) with project lead (ERC Starting Grant and Cariplo Foundation Grant) at the Electronics, Information and Bioengineering Department (DEIB) of Politecnico di Milano (Italy) |
| 2019-2022 | Postdoctoral research associate with project lead (H2020 MSCA IF) at the Electronics, Information and Bioengineering Department (DEIB) of Politecnico di Milano (Italy) |
| 2018-2019 | Postdoctoral research associate with project lead (SNSF Bridge PoC project) at the Biomedicine Department of the University Hospital of Basel (Switzerland) |
| 2015-2018 | Postdoctoral research associate funded by SNSF project at the Biomedicine Department of the University Hospital of Basel (Switzerland) |
| 2015 | Postdoctoral fellow at the Electronics, Information and Bioengineering Department (DEIB) of Politecnico di Milano (Italy) |
| 2014 | Visting PhD student at the AIBN of the University of Queensland (Australia) |
| 2009-2010 | Visting student at the Virginia Tech University (USA) |

Le seguenti sezioni devono avere lunghezza totale compresa fra 2 e 4 pagine.

RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

I am a bioengineer and entrepreneur with a deeply translational profile, bridging the gap between academic excellence and industrial innovation. As an Associate Professor at Politecnico di Milano and the CEO/Co-founder of BiomimX S.r.l., my career is dedicated to the development and commercialization of mechanically active Organs-on-Chip (OoC) as New Approach Methodologies (NAMs). By securing and coordinating highly competitive European funding (ERC Starting Grant, EIC Pathfinder) and raising over €4.5M in private/public funds for my start-up, I have demonstrated a unique capability to translate disruptive mechanobiology research into standardized, commercially viable technologies for pharmaceutical drug screening.

Research achievements

During my career, I've contributed to the publication of 40 articles in peer-reviewed international journals (1,787 citations, H-index 21 from Scopus on 19/05/2026) and 5 book chapters in the field of microfluidics and Organs-on-Chip (OoC). My research activities led to 2 patent applications in the field of microtechnologies (of which one granted globally, both transferred to and commercialized by the industry). As CEO of BiomimX, I possess a strong applicative and industrial profile, successfully translating lab innovations into commercial services.

Below selected publications with my main contribution:

1. Palma, C., Salehi, S., Polidoro, M.A., ... Lopa, S., **Occhetta, P.** A Compartmentalized Joint-on-chip (JoC) Model to Unravel the Contribution of Cartilage and Synovium to Osteoarthritis Pathogenesis. *Advanced Science*, 2025. DOI: 10.1002/advs.202500374
Role & Significance: *Corresponding author. I led the development of a novel Joint-on-Chip platform capable of elucidating complex tissue crosstalk, representing a major advancement in modelling osteoarthritis for preclinical drug screening. The project was fully funded by a grant in which I served as PI.*
2. Palma C, Piazza S, Visone R, Ringom R, Björklund U, Bermejo Gómez A, Rasponi M, Occhetta P, An Advanced Mechanically Active Osteoarthritis-on-Chip Model to Test Injectable Therapeutic Formulations: The SYN321 Case Study. *Advanced Healthcare Materials* (2024). 10.1002/adhm.202401187
Role & Significance: *Corresponding author. I coordinated this industrial research validation, demonstrating the platform's commercial value in testing real-world therapeutic formulations under dynamic mechanical stimulation. Notably, the data have been included in a successful IND application, unlocking a Phase I/IIa clinical trial.*
3. Palma C, Aterini B, Ferrari E, Mangione M, Romeo M, Nezi L, Lopa S, Manzo T, Occhetta P*, Rasponi M*, A compartmentalized microfluidic platform to investigate immune cells cross-talk in rheumatoid arthritis. *Biofabrication* (2024) 10.1088/1758-5090/ad80cf
Role & Significance: *Co-senior author. I guided the biological design of a multi-chamber OoC, establishing a reliable in vitro methodology to study immune responses, significantly expanding the scope of New Approach Methodologies (NAMs).*
4. Visone R, Paoletti C, Cordiale A, Nicoletti L, Divieto C, Rasponi M, Chiono V, Occhetta P, In vitro mechanical stimulation to reproduce the pathological Hallmarks of human cardiac fibrosis on a beating chip and predict the efficacy of drugs and advanced therapies. *Advanced Healthcare Materials* (2023). <https://doi.org/10.1002/adhm.202301481>
Role & Significance: *Corresponding author. I pioneered the use of mechanical triggers to reproduce cardiac fibrosis on-chip, providing a scalable model for testing advanced therapies.*
5. Visone R, Lozano F, Marzorati S, Rivolta MW, Pesenti E, Redaelli A, Sassi R, Rasponi M, Occhetta P, Predicting human cardiac QT alterations and pro-arrhythmic effects of compounds with a 3D beating heart-on-chip platform. *Toxicological Sciences* (2022) <https://doi.org/10.1093/toxsci/kfac108>
Role & Significance: *Corresponding author. I directed this pivotal study validating our uHeart technology against standard pharmaceutical compounds, bridging the gap between academic innovation and industrial safety pharmacology requirements.*
6. Occhetta P, Mainardi A, Votta E, Vallmajo-Martin Q, Ehrbar M, Martin I, Barbero A, Rasponi M. Hyper-Physiological Compression Triggers Osteoarthritic Traits in a Cartilage-on-Chip Model. *Nature Biomedical Engineering*, 2019. Doi: 10.1038/s41551-019-0406-3
Role & Significance: *First author. I discovered that purely mechanical overload can induce osteoarthritis in vitro, changing the paradigm of developmental engineering and mechanobiology.*
7. Occhetta P, Pigeot S, Rasponi M, Dasen B, Mehrkens A, Ullrich T, Kramer I, Guth-Gundel S, Barbero A, Martin I. Developmentally inspired programming of adult human mesenchymal stromal cells towards stable chondrogenesis. *PNAS*, 2018. Doi: <https://doi.org/10.1073/pnas.1720658115>

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Role & Significance: First author. I designed a developmental-inspired biochemical protocol to induce stable cartilage formation, significantly impacting the field of regenerative medicine.

International Patent Applications for which I am an inventor:

8. Rasponi M, Occhetta P, Cordiale A. Chip Microfluidico. 2025 (102025000016003).
Role & Significance: Co-inventor. This patent protects an advanced iteration of our microfluidic architecture, demonstrating continuous industrial research and IP generation to maintain a competitive technological edge.
9. Rasponi M, Occhetta P, Redaelli A. A microfluidic device and relative method for the generation and/or culture and/or maturation of three-dimensional cell and/or tissue constructs. 2015 (WO/2016/174607, granted by EPO EP16726176.7A, US, India and China).
Role & Significance: Co-inventor. I conceptualized "uBeat," a ground-breaking platform for 3D mechanical stimulation. This IP has been licensed to BiomimX and is actively commercialized globally through industrial B2B research contracts.

Start-up businesses

10. CEO and co-founder of BiomimX Srl
Role & Significance: CEO and Co-founder. I successfully transitioned from academic researcher to entrepreneur by establishing this Politecnico di Milano spin-off in 2017. I have managed the company from its foundation, growing it to a team of 10 employees and securing over €4.5M in raised funds. As CEO, I directly negotiate and manage B2B industrial research contracts with international top-tier pharmaceutical companies. Through these collaborations, the Organ-on-Chip platforms developed in my academic laboratory (such as uHeart and uKnee) have been successfully translated into proprietary, advanced predictive testing services. This tech-transfer activity has enabled the industrial validation of our platforms for toxicology and efficacy testing, generating over €1M in commercial revenues and demonstrating my strong market-oriented profile with a tangible impact on the biotech and pharma sectors.

Peer recognition

Selected competitive and peer-reviewed national and international grants for which I served as a PI:

1. Horizon Europe EIC Pathfinder Grant. "AI-RITMIA: AI-assisted personalized heart-on-chip as advanced diagnostic Tool for clinical significance assessment of Inherited cardiomyopathies". 2.99M€. Duration: 2026-2029. (Role: PI)
Significance: I am the Coordinator of a large multi-institution European consortium, blending AI and heart-on-chip technology. This highlights my high-level research management capabilities and international leadership.
2. Horizon Europe ERC Starting Grant. "EvOoC: Evolving Organs-on-Chip from developmental engineering to "mechanical re-evolution". 2.43M€. Duration: 2023-2028. (Role: PI)
Significance: One of the most prestigious competitive European grants, recognizing my frontier vision ("mechanical re-evolution") as a highly promising, disruptive scientific approach.
3. PRIN PNRR 2022, MUR. "AI-HEART: AI-guided generation of beating and sensing heart-on-chip for drug screening". 250k€. Duration: 2023-2025. (Role: PI)
4. Fondazione Cariplo, Ricerca Biomedica Condotta da Giovani Ricercatori. "Unravelling the molecular correlation between mechanical injuries and cartilage hypertrophy in osteoarthritis in a cartilage-on-chip model". 250k€. Duration: May 2022 – April 2026. (Role: PI)
5. Horizon Europe Women Tech EU. "Mimic human complexity in a Beat to revolutionize the drug development". 75k€. Duration: 2022. (Role: PI)
6. H2020 MSCA IF, Principal Investigator. "uKNEEversal: a miniaturized 3D in vitro model of human joint to gain new knowledge on Osteoarthritis pathophysiology." (Grant agreement no. 841975). 171k€. Duration: September 2019- August 2021. (Role: PI)
7. Bridge Proof-of-Concept, Principal Investigator. uKnee: a 3D miniaturized in vitro platform to screen candidate anti-osteoarthritis drugs. 130k CHF. Duration 2018. (Role: PI)

Significance of listed grants (3-7): Cumulatively, these grants highlight my consistent ability to secure competitive funding across various scales (regional, national, and European) and my progressive evolution as an independent Principal Investigator. The H2020 MSCA IF and Fondazione Cariplo grants formally validated my scientific independence and early leadership in developing pioneering models for osteoarthritis (uKNEEversal). The Bridge Proof-of-Concept and the Women Tech EU

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grants underscores my strong industrial profile, effectively bridging basic research and technology transfer by financing the preclinical validation of an anti-osteoarthritis drug screening platform. Finally, the PRIN PNRR grant reflects my capacity to lead forward-looking, multidisciplinary consortia at a national level, successfully integrating artificial intelligence with my core bioengineering expertise (heart-on-chip) to address modern pharmacological challenges. Together, they demonstrate a solid track record of over €850k in personal complementary funding that paved the way for my current ERC and EIC leadership (described more in details above).

Selected Invited oral to internationally established conferences:

1. "Beating Organs-on-Chip as preclinical tool for screening safety and efficacy of new therapeutics", ESB, September 2025, Torino
2. "Beating organs-on-chip as innovative technological platforms for drug discovery: advanced in vitro models of human physiology and pathology", AMYC, October 2023, Firenze
3. "Beating organs-on-chip as innovative tools for diseases modelling and advanced therapies evaluation: a case study in cardiac fibrosis", INTERNATIONAL SOCIETY FOR CELL & GENE THERAPY, May 2023, Paris.
4. "Beating organs-on-chips as advanced preclinical tools for drug screening and disease model", CSEM OoC and Organoids workshop, August 2022, Geneve.

Significance of talks: These invitations from top-tier bioengineering, cell therapy, and pharmacology societies certify my international recognition as a leading expert bridging the gap between basic OoC science and industrial regulatory applications.

Selected Awards and Prizes for Innovation:

1. Switch2Product Competition (2018): First prize awarded by Politecnico di Milano and Deloitte (€30k) for the commercial potential of the uBeat technology.
2. World TERMIS Business Plan Competition (2018): First prize in Kyoto, Japan, recognizing the global translational value of my tissue engineering platforms.
3. EIT Health Headstart Competition (2018): Prize awarded in the "Life Sciences" category (€43k) to accelerate the market entry of BiomimX.
4. StartCup Lombardia (2016): Best Startup idea in the "Life Sciences and Agrofood" category (€30k), awarded by Regione Lombardia.

Significance: These competitive innovation awards validate the exceptional industrial and commercial potential of my scientific discoveries, endorsing my successful transition from academic researcher to deep-tech entrepreneur.

ADDITIONAL INFORMATION

Other contributions to the research community

My complementary roles span institutional coordination, standardization, and representation, demonstrating mature research management:

1. **International Conference Management:** Chair and Organizer of the 2024 Annual Conference of the European Organ-on-Chip Society (EUROoCS) at Politecnico di Milano, managing over 700 international delegates.
2. **Regulatory Representation & Policy:** Since 2026, Vice President for Regulatory Adoption and Partnership of the Industrial Alliance for Microphysiological Systems (IAMPS), actively interfacing with regulatory bodies (EMA/FDA) to promote the adoption of New Approach Methodologies (NAMs).
3. **International Standardization (ISO/CEN):** Since 2025, Member of the ISO 276/Sub-committee 2 on Organs-on-Chip standardization (Project leader of Working Group 2 for "Bioscience"). Previously (2022-2024), responsible for the Bioscience subgroup in the CEN CENLEC Working Group. This reflects my direct impact on shaping global technological standards.

Outreach, Visibility, and Societal Impact

1. **Advocacy for New Approach Methodologies (NAMs) and the 3Rs:** I actively engage with policymakers and society to reduce animal testing in biomedical research, addressing a major ethical

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challenge. As VP for Regulatory Adoption of IAMPS and member of ISO/TC 276 and CEN/CENELEC working groups, I directly interface with regulatory agencies (e.g., EMA) to shape global guidelines and foster the regulatory acceptance of Organ-on-Chip technologies.

2. **Public Engagement and Scientific Dissemination:** I promote the societal impact of engineering by leading major dissemination events, such as chairing the 2024 European Organ-on-Chip Society (EUROoCS) Annual Conference, which brought over 700 international delegates to Milan. Furthermore, I regularly translate the outcomes of my frontier research (e.g., ERC EvOoC and EIC AI-RITMIA projects) to the lay public through institutional press releases, interviews, and public science events.
3. **Women Leadership in STEM and Deep-Tech:** As a female Associate Professor, ERC grantee, and CEO of a biomedical spin-off, I actively act as a role model. I frequently participate in public speaking panels, deep-tech startup ecosystems, and mentoring programs to promote engineering careers among young women and help narrow the gender gap in technology and entrepreneurship.

Career breaks, diverse career paths and major life events

Interruzione carriera per maternità: dal 01/02/2021 al 30/06/2021 (maternità obbligatoria); dal 10/01/2022 al 10/04/2022 (Congedo parentale); dal 02/04/2025 al 04/09/2025 (maternità obbligatoria)