

Emanuela Jacchetti

+39 349 5675776 ✉ emanuela.jacchetti@polimi.it, ejacchetti@gmail.com, 📍 Via Alberto Nota 46, 20126 Milano, Italy

PERSONAL INFORMATION

Date of birth: 25.09.1979 Place: Vigevano (PV), Italy Nationality: Italy
URL for web site: <https://www.cmic.polimi.it/persona/docenti-e-ricercatori/jacchetti-emanuela/>
<http://www.nichoid.polimi.it/mechanobiologylab/>

EDUCATION

03/02/2009 PhD in Physics, Astrophysics and Applied Physics. Physics Department, Università degli Studi di Milano, Milan, Italy. PhD Supervisor: Prof. Paolo Milani. Thesis title: "Differentiation and cytoskeletal protein dynamics of PC12 cells cultured on nano-structured titanium dioxide surfaces". E. valuation: Not Applicable
07/06/2005 Master's degree in Physics. Physics Department, Università degli Studi di Milano, Milan, Italy. Evaluation: 106/100. Thesis title: "Neutronization in the gravitational collapse of massive stars".
1998 July: Scientific Diploma at "Gerolamo Cardano" Scientific High School, Milan. Evaluation: 49/60.

NATIONAL SCIENTIFIC HABILITATION for permanent professorship

(<https://www.anvur.it/en/activities/asn/>)

2021—2030 National Scientific Qualification as II level professor for the S.C. 02/D1 Applied Physics, Didactics, History of Physics (introduced pursuant to art. 7 bis of the Law Decree of 8 April 2020, no. 22, coordinated with the Conversion Law of 6 June 2020, no. 41.).
2020—2029 National Scientific Qualification as II level professor for the S.C. 09/G2 - Bioengineering (introduced pursuant to art. 7 bis of the Law Decree of 8 April 2020, no. 22, coordinated with the conversion law of 6 June 2020, no. 41.).

CURRENT POSITION

2018 Assistant Professor, Faculty of Engineering, Department of Chemistry, Politecnico di Milano, Italy

PROFESSIONAL POSITION HELD

16/01/2018 – day Assistant Professor. Faculty of Engineering, Department of Chemistry, Materials and Chemical Engineering "G.Natta", Politecnico di Milano, Italy. Prot n. 2017 VII/2 N. 011709 del 12/12/2017, founding by ERC-CoG-2014 NICHOID.
16/10/2015 – 15/01/2018 Post-Doctoral fellowships. Faculty of Engineering, Department of Chemistry, Materials and Chemical Engineering "G.Natta", Politecnico di Milano, Italy. Rep n. 1327 reg il 28.07.2015 prot n. 50705. Prot n. 0078519 del 11/10/2010 [UOR: SI000071-Classif III/13]. Hired on the project ERC-CoG-2014 NICHOID.
15/10/2014 – 15/10/2015 Post-Doctoral fellowship. Center for Experimental Imaging, IRCCS San Raffaele Scientific Institute, Milan, Italy. DdP AL/Prot. R342. Data 1.10.2014.
01/01/2014 – 14/10/2014 Post-Doctoral fellowship. Istituto di Biofisica - Consiglio Nazionale delle Ricerche, Pisa, Italy. Prot. N. 0004609 del 19.12.201
01/12/2012 – 31/12/2013 Post-Doctoral fellowship. Scuola Normale Superiore, Laboratorio NEST (National Enterprise for nanoScience and nanoTechnology) e Istituto CNR NANO. Pisa, Italy. Founding by ERC-StG2010-NanoCARD. Prot 15962 Pos. VII/16 del 5.12.2012.
01/12/2010 – 30/11/2012 Post-Doctoral fellowship. Scuola Normale Superiore, NEST (National Enterprise for nanoScience and nanoTechnology) Lab and Istituto CNR NANO. Pisa, Italy. Founding by ERC-StG2010-NanoCARD. Reg. n. 348 del 13.12.2010.
02/01/2010 – 30/11/2010 Post-Doctoral fellowship. Istituto di Biofisica – CNR. and Centro di Biotecnologie Avanzate. Genoa, Italy. n. 230 del 24.12.2009
01/12/2009 – 31/01/2010 Scholarship. Istituto di Biofisica – CNR. Genoa, Italy. Founded by FFC#6/2009. Project "Direct visualization of CFTR conformation by atomic force microscopy Imaging".
10/02/2009 – 31/10/2009 Post-Doctoral fellowship. Istituto di Biofisica – CNR. and Centro di Biotecnologie Avanzate. Genoa, Italy. n. 230 del 24.12.2009

TEACHING ACTIVITIES**Ph.D. Courses**

- 2021–2022 CO-LECTURER, course "Communication strategies that score in worldwide academia", scientific disciplinary sector: ING-IND/34 (Industrial Bioengineering), 5 credits, Ph.D. program in Bioengineering, Politecnico di Milano, Milan, Italy. (Language English).
- 2020–2021 CO-LECTURER, course "Communication strategies that score in worldwide academia", scientific disciplinary sector: ING-IND/34 (Industrial Bioengineering), 5 credits, Ph.D. program in Bioengineering, Politecnico di Milano, Milan, Italy. (Language English).
- 2015–2016 LECTURER, course "Mechanobiology", 2 credits (around 30 students/year), Inter-departmental Ph.D. program in Bioengineering, Politecnico di Milano, Milan, Italy. I designed and taught the part regarding optical microscopy techniques applied to cell mechanotransduction (Language English).
- 2019 May: INVITED LECTURER to the Ph.D. program lectures aa 2018/2019. Università degli Studi dell'Insubria, Dipartimento di Biotecnologie e Scienze della Vita. Lesson title: "Advanced fluorescence microscopy techniques applied to biomechanics" (Language English).
- 2018 June: INVITED LECTURER to the Ph.D. program lectures aa 2017/2018. Università degli Studi dell'Insubria, Dipartimento di Biotecnologie e Scienze della Vita. Lesson title: "Confocal microscopy for the analysis of 3D stem cell niches" (Language English).

Master's degree Courses

- 2020–2021 LECTURER – course "Technologies for Regenerative Medicine", 5 credits (around 160 students/year), Master of Science program in Biomedical Engineering, Politecnico di Milano, Milan, Italy.
- 2021–2022 CO-LECTURER – course "Technologies for Regenerative Medicine", 10 credits (around 160 students/year), Master of Science program in Biomedical Engineering, Politecnico di Milano, Milan, Italy. I designed and focalized my lessons on mass transport phenomena in the fields of regenerative medicine.
- 2018–2020 CO-LECTURER – course "Technologies for Regenerative Medicine", 10 credits (around 160 students/year), Master of Science program in Biomedical Engineering, Politecnico di Milano, Milan, Italy. I designed and focalized my lessons on mass transport phenomena in the fields of regenerative medicine (Language English).
- 2017–2019 INVITED TEACHER at the "Micro and Nanostructure laboratory" Course. 5 Credits. Master of Science program in Biomedical Engineering, Politecnico di Milano, Milan, Italy. Lesson title: "Optical microscopy to evaluate micro/nanostructured scaffolds in biological applications".
- 2016–2018 INVITED TEACHER on contract – course "Technologies for Regenerative Medicine", 10 credits (around 300 students/year), Master of Science program in Biomedical Engineering, Politecnico di Milano, Italy. I designed and focalized my lessons on mass transport phenomena in the fields of regenerative medicine (English).
- 2006–2009 Laboratory ASSISTANT on contract – course "Physics I and II", Physics Department, Università degli Studi di Milano, Milan, Italy.
- 2006–2007 Laboratory ASSISTANT on contract – course "Physics", Department of Pharmacy, Università degli Studi di Milano, Milan, Italy.

SCIENTIFIC SUPERVISION OF PhD. STUDENTS, MASTER STUDENTS, BACHELOR STUDENTS

- 2016–day. Faculty of Engineering, School of Biomedical Engineering, Department of Chemistry, Politecnico di Milano, Italy. CO-SUPERVISOR of 7 Ph.D. Students - SUPERVISOR of 7 Master Students, CO-SUPERVISOR of 7 Master Students - SUPERVISOR of 9 Bachelor thesis, CO-SUPERVISOR of 5 Bachelor thesis. (Bachelor's theses are performed by 3-4 students each). 60% of my Master Students are now Ph.D. students, 3 employed at centres of excellence working on advanced optics and 3D bioprinting techniques.
- 2010–2014. CO-SUPERVISOR of 3 Master Students. Scuola Normale Superiore, Laboratorio NEST (National Enterprise for nanoScience and nanoTechnology) e Istituto CNR NANO. Pisa, Italy. The Scuola Normale Superiore nowadays is an elite school with an egalitarian basis that awards merit, talent, and the potentialities of its students independently from their social origins and their previous studies. It is ranked the first scientific university in Italy and at the 22 in the World University Ranking 2019.

INSTITUTIONAL RESPONSIBILITIES

- 2020–day MEMBER of the Degree Program Commission in Biomedical Engineering, Faculty of Engineering, Politecnico di Milano, Italy
- 2019–day MEMBER of the Communication Commission of the CMIC, Faculty of Engineering, Politecnico di Milano, Italy
- 2018–day MEMBER of the Graduation Commission, Degree and Master of Science programs in Biomedical

Engineering, Faculty of Engineering, Politecnico di Milano, Italy

2018–day MEMBER of the Graduation Commission, Degree and Master of Science programs in Chemical Engineering, Faculty of Engineering, Politecnico di Milano, Italy

2016–day LAB MANAGER of the Mechanobiology Lab; Faculty of Engineering, Department of Chemistry, Politecnico di Milano, Italy

2016–day LAB MANAGER of the interdepartmental laboratory of Live Cell Imaging (LuCiD Lab); Faculty of Engineering, Department of Chemistry, Politecnico di Milano, Italy

FOUNDED GRANTS

2018–2019: PI. Research project title: “Effect of Nichoid substrates on mesenchymal stem cell migration and modulation of transcription factors nuclear import”. Founding: Euro-BioImaging Access application EuBI_EMJA093 (<https://www.eurobioimaging-interim.eu/apply-for-access.html>).

2018–2021. CO-PI. Research project title “BEYOND: Direct laser writing nanofabricated imaging window for intravital evaluation of biomaterials”, Founding: MIUR.AOODGRIC.REGISTRO_FARE.0000012.25-01-2017. (Panel ERC PE8_13 INDUSTRIAL BIOENGINEERING).

2020–2021: TEAM MEMBER SENIOR SCIENTIST. Grant title: “EGGS&BEACON, Development of a device for in vivo testing of drugs and vaccines”. Funding: Intramural Switch to Product call (S2P 2020).

ONGOING FOUNDED GRANTS

Scientific coordination and supervision of research in the field of fluorescence microscopy

2021–2025. Grant title: “An in vivo bioengineered chip as a smart intravital multiphoton imaging windows for new validation protocols of biomaterials”. Founding: FETOPEN 2020. PI: G.Chirico, Università Bicocca

2020–2023. Grant title: “REdirecting metastatic tumor cells: pre-clinical evaluation of migrastatics in neuroblastoma”. Founding: CARIPARO. PI. Sanja Aveic, Institute of Pediatric research - Padova.

2021–2022. Grant title: “Secretoma of mesenchymal stromal cells in chronic pulmonary diseases: validation of an innovative approach for the treatment of COVID-induced pulmonary fibrosis 19”. Founding: MUR FISRCOVID 2020 call. PI G.Pelizzo, Department of Biomedical and Clinical Sciences "L. Sacco", Università degli Studi di Milano

2019–2022. Project title: “Analysis of lateral amyotrophic sclerosis in 3D cultures”. PI: Cereda C., Center for Genomics and Post-Genomics. C. Mondino Neurological Institute Foundation. Funding: AIFA - Project Number: 2017-004459-21, FRRB 2015-023, TRANS-ALS.

Participation at the research activity

2021–2022. Project title: “Advanced in vitro models for “on orbit” investigations: Nichoid in space”. Founding: SciSpacE Physical Sciences roadmaps (2020) della European Space Agency. PI: Gianni Ciofani, Istituto Italiano di Tecnologia, Pontedera, Italy.

2020–2022. Project title: “Development of a hematopoietic niche in vitro”. PI: Raimondi MT., Department of Chemistry of the Milan Polytechnic. Funding: British NC3Rs on the Crack-IT tender.

2019–2022. Project title: “Study of the deformation of muscle tissue in healthy and diseased samples”. PI. Matas Rodriguez J.F. Department of Chemistry of the Politecnico di Milano. Funded by the association "Gli Amici di Emanuele Fondo DMD".

2015–2020. Project title: “Mechanobiology of nuclear import of transcription factors modelled within a bioengineered stem cell niche”. NICHOID-ERC-CoG-2014 project. PI: Raimondi MT, Department of Chemistry of Politecnico di Milano

2018–2020. Project title: “Investigation of cellular toxicity induced by pulsed laser radiation”. Founding: ViBRA-ERC-CoG-2014 project. PI: Polli D., Physic Department, Politecnico di Milano

SPEAKER/INVITED SPEAKER AT CONFERENCES

Invited speaker

2022 National Workshop on Biomechanics and Mechanobiology, Firenze, Italy.

2021 National Congress of Physics Society (SIF).

2017 International "Nanoengineering for Mechanobiology symposium". Camogli, Genova, Italy.

2014 XVIII International School “Nanomechanics in biomolecular adhesion”. Venezia, Italy.

Speaker

2021 International Congress of Tissue Engineering and Regenerative Medicine International Society (TERMIS), World Chapter.

2021 26th International Congress of the European Society of Biomechanics (ESB).

2021 National Congress of Bioengineering Group (GNB).

- 2019 Tissue Engineering and Regenerative Medicine International Society (TERMIS), European Chapter. Rhodes, Greece.
- 2012 Workshop “NanoII/NanoCARD Workshop”, Max Planck Institute, Stuttgart, Germany.
- 2012 International Workshop on Nanomedicine and Nanobiosystems, WOMEN, Lecce, Italy.
- 2012 National Workshop on “Nanotechnologies HealthCare”, Trento, Italy.
- 2010 National Congress of Biophysics “SIBPA” 2010. Arcidosso, Italy.
- 2008 International School of Biophysics «ANTONIO BORSELLINO», Erice, Italy.

Short Speaker

- 2010 International School on “Nano- and Micro-Mechanics of Living Cell Adhesion”, Udine, Italy.
- 2007 International CFN summer school on Nano-Biology and Nano-Electronics 2007. Università di Karlsruhe, Bad Herrenalb, Germany.

AWARDS

- 2013 Italian Society of Pure and Applied Biophysics (SIBPA) scholarship
- 2010 Italian Society of Pure and Applied Biophysics (SIBPA) scholarship
- 2010 International Centre for Mechanical Sciences (CISM) scholarship

REVIEWING ACTIVITIES

- 2021-2022. GUEST EDITOR. “Development of Advanced Nanomaterials for Multifunctional Devices: Insights into a Novel Concept of Personalized Medicine”. Special issue of Journal of Nanotheranostics (https://www.mdpi.com/journal/jnt/special_issues/nano_multidevices).
- 2021-2022. GUEST EDITOR. “Mechanotransduction in health and disease”. Special issue of JoVE Journal. (<https://www.jove.com/methods-collections/1160>).
- 2021-day. EXTERNAL REVIEWER for the KU Leuven (University of Leuven) grants, Belgium.
- 2020-day. EXTERNAL REVIEWER for the “Fondation pour la Recherche Médicale” grants. (<https://www.frm.org/en>).
- 2020-day. PANEL MEMBER for the evaluation of the best master thesis on Bioengineering (GNB awards)
- 2019-day. EXTERNAL REVIEWER for the Human Frontier Science Program (HFSP) grants, (<https://www.hfsp.org/>).
- 2019-day. PEER REVIEWER for Proceedings of the conferences organized by the National Group of Bioengineering (GNB)
- 2018-day. EDITORIAL BOARD, Methods and Protocols Journal
- 2014-day. PEER REVIEWER of several international ISI journals (Nature Communications, Science and Technology of Advanced Materials, Scientific reports, Cells, Frontiers in physiology, Frontiers in Cell and Developmental Biology, Methods and protocols, Patron Editore –Bioengineering Group Proceedings, ...).

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2016-2022 Tissue Engineering & Regenerative Medicine Society (TERMIS)
- 2021-2022 Italian Society of Physics (SIF)
- 2016-2022 National Bioengineering Group (GNB)
- 2010-2013 Pure and Applied Biophysics Society (SIBPA)
- 2009-2010 European Microscopy Society (EMS)

SELECTED PUBLICATIONS (citation number indicated in square brackets)

1. Conci C., **Jacchetti E.**, Sironi L., Gentili L., Cerullo G., Osellame R., Chirico G., Raimondi M.T. (2022). A miniaturized imaging window to quantify intravital tissue regeneration within a 3D micro scaffold in longitudinal studies. *Adv. Optical Mater.* 2022, 2101103. doi: 10.1002/adom.202101103. [0]
2. Garofalo M, Pandini C, Bordoni M, **Jacchetti E**, Diamanti L, Carelli S, Raimondi MT, Sproviero D, Crippa V, Carra S, Poletti A, Pansarasa O, Gagliardi S, Cereda C. RNA Molecular Signature Profiling in PBMCs of Sporadic ALS Patients: HSP70 Overexpression Is Associated with Nuclear SOD1. *Cells*. 2022 Jan 15;11(2):293. doi: 10.3390/cells11020293. [1]
3. **Jacchetti E.*** and Nasehi R.*, Boeri L., Parodi V., Negro A., Albani D., Osellame R., Cerullo G., Rodriguez Matas J.F, Raimondi M.T. (2021). The nuclear import of the transcription factor MyoD is reduced in mesenchymal stem cells grown in a 3D micro-engineered niche. *Scientific Reports* 11:1-19 doi: 10.1038/s41598-021-81920-2. [2]
4. Raimondi M.T., Donnalaja F., Barzaghini B., Bocconi A., Conci C., Parodi V., **Jacchetti E.* AND** Carelli S.* (2020). Bioengineering tools to speed up the discovery and preclinical testing of vaccines for SARS-CoV-2 and therapeutic agents for COVID-19. *Theranostics* 10:7034-7052. doi:10.7150/thno.47406. [16]
5. Donnalaja F., Carnevali F., **Jacchetti E.* AND** Raimondi M.T.* (2020). Lamin A/C Mechanotransduction in Laminopathies. *Cells* 9:1306-1338, doi: 10.3390/cells9051306. [14]
6. Donnalaja F., **Jacchetti E.**, Soncini M., Raimondi M.T. (2020). Natural and Synthetic Polymers for Bone Scaffolds Optimization. *Polymers* 12:1-27, doi: 10.3390/polym12040905. [53]
7. Parodi V., **Jacchetti E.**, Bresci A., Talone B., Valensise C.M., Osellame R., Cerullo G., Polli D., Raimondi M.T. (2020). Characterization of Mesenchymal Stem Cell Differentiation within Miniaturized 3D Scaffolds through Advanced Microscopy Techniques. *International Journal of Molecular Science* 21:1-21 doi: 10.3390/ijms21228498. [2]
8. Parodi V., **Jacchetti E.**, Osellame R., Cerullo G., Polli D., Raimondi M.T. (2020). Nonlinear Optical Microscopy: From Fundamentals to Applications in Live Bioimaging. *Frontiers in Bioengineering and Biotechnology* 8:1-18. doi: 10.3389/fbioe.2020.585363 [12]
9. Boeri L., Albani D., Raimondi M.T.* and **Jacchetti E.*** (2019). Mechanical regulation of nucleocytoplasmic translocation in mesenchymal stem cells: characterization and methods for investigation. *Biophysical Reviews* 11:817-831, doi: 10.1007/s12551-019-00594-3. [13]
10. Donnalaja, F., **Jacchetti E.**, Soncini, M., Raimondi, M. T. (2019). Mechanosensing at the Nuclear Envelope by Nuclear Pore Complex Stretch Activation and Its Effect in Physiology and Pathology. *Frontiers in Physiology* 10:896, doi: 10.3389/fphys.2019.00896 [24]
11. Garcia Gonzales A.***AND Jacchetti E.*** and Marotta R., Tunesi M., Rodríguez Matas J.F., Raimondi M.T. (2018). The effect of cell morphology on the permeability of the nuclear envelope to diffusive factors. *Frontiers in Physiology* 9:925. doi: 10.3389/fphys.2018.00925. [13]
12. Loffreda A.***AND Jacchetti E.***, Antunes S., Rainone P., Daniele T., Morisaki T., Bianchi M.E., Tacchetti C., Mazza D. (2017). Live-cell p53 single-molecule binding is modulated by C-terminal acetylation and correlates with transcriptional activity. *Nature Communications* 8:313-324, doi: 10.1038/s41467-017-00398-7. [52]
13. **Jacchetti E.**, Gabellieri E., Cioni P., Bizzarri R., Nifosì R. (2016). Temperature and pressure effects on GFP mutants: explaining spectral changes by molecular dynamics simulations and TD-DFT calculations. *Physical Chemistry Chemical Physics* 18:12828-12838, doi: 10.1039/c6cp01274d. [8]

14. Mariotti, S, Barravecchia, I, Vindigni, C, Pucci, A, Balsamo, M, Libro, R, Senchenko, V, Dmitriev, A, **Jacchetti E.**, Cecchini, M, Roviello, F, Lai, M, Broccoli, V, Andreazzoli, M, Mazzanti, Cm, Angeloni, D.1. (2016). MICAL2 is a novel human cancer gene controlling mesenchymal to epithelial transition involved in cancer growth and invasion. *Oncotarget*. 2;7(2):1808-1825, doi: 10.18632/oncotarget.6577. [39]
15. Tonazzini I., **Jacchetti E.**, Meucci S., Beltram F., Cecchini M. (2015). Schwann Cell Contact Guidance versus Boundary Interaction in Functional Wound Healing along Nano and Microstructured Membranes. *Advanced Healthcare Materials* 4:1849-1860, doi: 10.1002/adhm.201500268. [31]
16. **Jacchetti E.**, Tonazzini I., Meucci S., Beltram F., Cecchini M. (2014). Microstructured polydimethylsiloxane membranes for peripheral nerve regeneration. *Microelectronic Engineering* 124:26-29, doi: 10.1016/j.mee.2014.04.014. [8]
17. **Jacchetti E.**, Di Rienzo C., Meucci S., Nocchi F., Beltram F., Cecchini M. (2014). Wharton's Jelly human mesenchymal stem cell contact guidance by noisy nanotopographies. *Scientific Reports* 4:3830, doi: 10.1038/srep03830. [16]
18. Di Rienzo C., **Jacchetti E.**, Cardarelli F., Bizzarri R., Beltram F. and Cecchini M. (2013). Unveiling LOX-1 receptor interplay with nanotopography: mechanotransduction and atherosclerosis onset. *Scientific Reports*. 3:1141. doi: 10.1038/srep01141. [19]
19. Vittorio O, **Jacchetti E.**, Pacini S, Cecchini M. (2013). Endothelial differentiation of mesenchymal stromal cells: when traditional biology meets mechanotransduction. *Integrative Biology* 5(2):291-299, doi: 10.1039/C2IB20152F. [19]
20. **Jacchetti E.**, Emilriti E., Rodighiero S., Indrieri M., Gianfelice A., Lenardi C., Podesta' A., Ranucci E., Ferruti P., Milani P. (2008). Biomimetic poly(amidoamine) hydrogels as synthetic materials for cell culture. *Journal of Nanobiotechnology* 6:14, doi: 10.1186/1477-3155-6-14. [24]