



Curriculum Vitae

Personal information **Maurizio Pesce**

Work experience

Group Leader

Centro Cardiologico Monzino, IRCCS [01/04/2014 – Current]

City: Milan

Country: Italy

Group Leader of the Cardiovascular Tissue Engineering Research Group. Coaching undergraduate/PhD students; post-doctoral fellows. research activities in the field of experimental medical devices. Reviewer for numerous grant organizations and more than 40 International peer-reviewed journals.

Cell/tissue engineering; cell mechanosensation; cellular biology; molecular biology; imaging; in vivo models of cardiovascular diseases; bioreactors; biomaterials; lab-on-chips.

Senior Scientist/Staff Member/Deputy Director

Centro Cardiologico Monzino, IRCCS [01/04/2001 – 31/03/2014]

City: Milano

Country: Italy

Senior Scientist/Staff Member/ Deputy Director in the Laboratories of vascular pathology/regenerative medicine and tissue engineering.

Stem cell-based cardiovascular regenerative medicine; tissue engineering; mentoring undergraduate/PhD students; clinical translation of cell therapy products.

Research Associate

Università di Roma Tor Vergata [01/01/1999 – 30/03/2001]

City: Roma

Country: Italy

Molecular determination of the mammalian germline; pluripotent cell biology; embryology; histology

Postdoctoral Fellow

European Molecular Biology Laboratory [01/01/1996 – 31/12/1998]

City: Heidelberg

Country: Germany

Regulation of pluripotent cells master gene Oct-4 in undifferentiated mammalian embryonic cells and the germline

PhD - Embryology

Università di Roma Tor Vergata [1991 – 1995]

BSc - Biology

Università di Roma La Sapienza [1984 – 1991]

Additional information

Publications

1. Barbieri, S.S., Cattani, F., Sandrini, L., Grillo, M.M., Amendola, A., Valente, C., Talarico, C., Iaconis, D., Turacchio, G., Lucariello, M., Lione, I., Salvatori, E., Amadio, P., Garoffolo, G., Maffei, M., Galli, F., Beccari, A.R., Sberna, G., Marra, E., Zoppi, M., Michaelides, M., Roscilli, G., Aurisicchio, L., Bertini, R., Allegretti, M. and **Pesce, M***. Relevance of Spike/Estrogen Receptor- α interaction for endothelial-based coagulopathy induced by SARS-CoV-2. *Signal Transduct. Target. Ther.* 2023; 10.1038/s41392-023-01488-3.
2. Alhejailan Saud, R., Garoffolo, G., Raveendran, V.V. and **Pesce, M***. Cells and Materials for cardiac repair and regeneration. *J. Clin. Med.* (2023) 12(10); 3398, 10.3390/jcm12103398.
3. Curini, L. and **Pesce, M.*** Shockwaves delivery for aortic valve therapy – realistic perspective for clinical translation? *Front. Cardiovasc. Res.* 2023; 15(53), 10.3389/fcvm.2023.1160833
4. Mongelli, A., Panunzi, S., Nesta, M., Gottardi-Zamperla, M., Atlante, S., Barbi, V., Mongiardini, V., Ferraro, F., DeMartino, S., Cis, L., Re, A., Maltese, S., Bachetti, T., LaRovere, M., Martelli, F., **Pesce, M.**, Nanni, S., Massetti, M., Pontecorvi, A., Farsetti, A. and Gaetano, C. Distinguishable DNA Methylation Defines a Cardiac-Specific Epigenetic Clock. *Clin. Epigenetics* 2023; 15 10.1186/s13148-023-01467-z
5. Gaetano, C., **Pesce, M.**, Beltrami, A.P. and Capogrossi, M.C. Cardiovascular Cell Senescence in Aging and Disease. *Front. Cardiovasc. Res.* 2023; 10.3389/fcvm.2023.1177395
6. **Pesce M. ***, Pompilio, G. and Bartunek, J. The LIMA: A ‘Drug-eluting Graft’ and Coronary ‘Flow-shock Absorber’. *Mayo Clin. Proc.* 2023, 98(1), 15-17.
7. **Pesce, M.***, Duda, G.N., Forte, G., Girao, H., Raya, A., Roca-Cusachs, P., Sluijter, J.P.G., Tschöpe, C. and Van Linthout, S. Cardiac fibroblasts and mechanosensation in heart development, health and disease. *Nat. Rev. Cardiol.*, 2023; 20(5), 309–324.
8. Gyongyosi, M., Alcaide P., Asselbergs, F.W., Brundel, B.J.J.M., Camici, G., da Costa Martins, P., Ferdinandy, P., Fontana, M., Girao, H., Gnechchi, M., Gollmann-Tepeköylü, Kleinbongard, P., Krieg, T., Madonna, R., Paillard, M., Pantazis, A., Perrino, C., **Pesce, M.**, Schiattarella, G.G., Sluijter, J.P.G., Steffens, S., Tschöpe, C., van Linthout, S., Davison, S.M. Long COVID and the Cardiovascular System – Elucidating Causes and Cellular Mechanisms in order to Develop Targeted Diagnostic and Therapeutic Strategies. A joint Scientific Statement of the ESC Working Groups on Cellular Biology of the Heart and Myocardial & Pericardial Diseases. *Cardiovasc. Res.* 2023; 10.1093/cvr/cvac115.
9. Rizzi, S., Mantero, S., Boschetti, F. and **Pesce, M***. Luminal endothelialization of small caliber silk tubular grafts for vascular constructs engineering. *Front. Cardiovasc. Res.* 2022,

- 10.3389/fcvm.2022.1013183.
10. Ragazzini, S., Scocozza, F., Bernava, G., Auricchio, F., Colombo, G.I., Barbuto, M., Conti, M., **Pesce, M.** and Garoffolo, G. Mechanosensor YAP cooperates with TGF- β 1 signaling to promote myofibroblast activation and matrix stiffening in a 3D model of human cardiac fibrosis. *Acta. Biomat.*, 2022; 152, 300-312. 10.1016/j.actbio.2022.08.063.
 11. Garoffolo G., Casaburo, M., Amadeo, F., Salvi, M., Bernava, G., Piacentini, L., Chimenti, I., Zaccagnini, G., Milcovich, G., Zuccolo, E., Agrifoglio, M., Ragazzini, S., Baasansuren, O., Cozzolino, C., Chiesa, M., Ferrari, S., Carbonaro, D., Santoro, R., Manzoni, M., Casalis, L., Raucci, A., Molinari, F., Menicanti, L., Pagano, F., Ohashi, T., Martelli, F., Massai, D., Colombo, G.I., Messina, E., Morbiducci, U. and **Pesce, M.***. Reduction of cardiac fibrosis by interference with YAP-dependent transactivation. *Circ. Res.* 2022, 131, 239–257;10.1161/CIRCRESAHA.121.319373.
 12. Maselli, D., Garoffolo, G., Cassanmagnago G., Vono, R., Ruitter M.S., Thomas, A.C., Madeddu, P., **Pesce, M.#**, Spinetti, G. Mechanical Strain Induces Transcriptomic Reprogramming of Saphenous Vein Progenitors. *Front. Cardiovasc. Med.* 2022, 10.3389/fcvm.2022.884031
 13. Rizzi, S., Ragazzini, S., **Pesce, M.***. Engineering efforts to refine compatibility and duration of aortic valve replacements: an overview of old promises and new developments. *Front. Cardiovasc. Med.* 2022, 10.3389/fcvm.2022.863136.
 14. Bernava, G., Fermi, E., Gelpi, G., Rizzi, S., Benettin, D., Barbuto, M., Romagnoni, C., Ventrella, D., Palmieri, M.C., Agrifoglio, M., Polvani, G., Bacci, M.L., Pasquino, E and **Pesce, M.***. Lithotripsy of calcified aortic valve leaflets by a novel ultrasound transcatheter-based device. *Front. Cardiovasc. Med.* 2022, [10.3389/fcvm.2022.850393](https://doi.org/10.3389/fcvm.2022.850393).
 15. Van der Velden, J., Asselbergs, F.W., Bakkers, J., Batkai, S., Bertrand, L., Bezzina, C.R., Bot, I., Brundel, B., Carrier, L., Chamuleau, S., Ciccarelli, M., Dawson, D., Davidson, S.M., Dendorfer, A., Duncker, D.J., Eschenhagen, T., Fabritz, L., Falcão-Pires, I., Ferdinandy, P., Giacca, M., Giraó, H., Gollmann-Tepeköylü, G., Gyöngyösi, M., Guzik, T., Hamdani, N., Heymans, S., Hilfiker, A., Hilfiker-Kleiner, D., Hoekstra, A.G., Hulot, J.-S., Diederik Kuster, D., van Laake, L.W., Lecour, S., Leiner, T., Linke, W.A., Lumens, J., Lutgens, E., Madonna, R., Maegdefessel, R., Mayr, M., van der Meer, P., Passier, R., Perbellini, F., Perrino, C., **Pesce, M.**, Priori, S., Remme, C.A., Rosenhahn, B., Schotten, U., Schulz, R., Sipido, K., Sluijter J.P.G., van Steenbeek, F., Steffens, S., Terracciano, C.M., Tocchetti, C.G., Vlasman, P., Yeung, K.K., Zacchigna, S., Zwaagman, D., Thum, T. Animal models and animal-free innovations for cardiovascular research: current status and routes to be explored. Consensus document of the ESC Working Group on Myocardial Function and the ESC Working Group on Cellular Biology of the Heart. *Cardiovasc. Res.* 2022; doi: 10/1093/cvr/cvab/370.
 16. Lecour, S., Du Pré, B.C., Bøtker, H.E., Brundel, B.J.J.M., Daiber, A., Davidson S.M., Ferdinandy, P., Giraó, H., Gollmann-Tepeköylü, C., Gyöngyösi, M., Hausenloy, D.J., Madonna, R., Marber, M., Perrino, C., **Pesce, M.**, Schulz, R., Sluijter, J.P.G., Steffens, S., Van Linthout, S., Young M.E., Van Laake, L.W. Position paper of the ESC Working Group on Cellular Biology of the Heart: Circadian rhythms in ischaemic heart disease. Key aspects for preclinical and translational research.

Cardiovasc. Res. 2022; 10.1093/cvr/cvab293.

17. Ferrari, S. and **Pesce, M***. The complex interplay of inflammation, metabolism, epigenetics and sex in calcific disease of the aortic valve. *Front. Cardiovasc. Med.* 2022; doi: 10.3389/fcvm.2021.791646.
18. Severino Ulloa, L., Perissinotto, F., Rago, I., Goldoni, A., Santoro, R., **Pesce, M.**, Casalis, L., Scaini, D. Carbon nanotubes substrates alleviate pro-calcific evolution in porcine valve interstitial cells. *Nanomaterials* 2021; 10.3390/nano11102724
19. **Pesce, M***, Agostoni, P., Bøtker, H.-E., Brundel, B., Davidson, S.B., De Caterina, R., Ferdinandy, P., Girao, H., Gyöngyösi, M., Hulot, J.-S., Lecour, S., Perrino, C., Schulz, R., Sluijter, J.P.G., Steffens, S., Tancevski, I., Gollmann-Tepeköylü, C., Tschöpe, C., Van Linthout, S. and Madonna, R. Opinion paper of the ESC Working Group on Cellular Biology of the Heart: COVID-19 related cardiac complications – from clinical evidences to basic mechanisms. *Cardiovasc. Res.* 2021; 10.1093/cvr/cvab201
20. Garoffolo, G. and **Pesce, M.** Vascular dysfunction and pathology: focus on mechanical forces. *Vasc. Biol.* 2021; 10.1530/VB-21-0002
21. Garoffolo, G. and **Pesce, M.** From dissection of fibrotic pathways to assessment of drug interactions to reduce cardiac fibrosis and heart failure. *Curr. Res. Pharmacol. Drug. Discov.* 2021; 10.1016/j.crphar.2021.100036
22. Greco, A., Garoffolo, G., Chiesa, E., Riva, F., Dorati, R., Modena, T., Conti, B., **Pesce, M.** and Genta, I. Nanotechnology, a booster for the multitarget drug Verteporfin. *J. Drug Deliv. Sci. Technol* 2021; 10.1016/j.jddst.2021.102562
23. Ferrari, S. and **Pesce, M.** Stiffness and aging in cardiovascular diseases: the dangerous relationship between force and senescence. *Int. J. Mol. Sci.* 2021; 10.3390/ijms22073404.
24. Campagnolo, P. and **Pesce, M***. Biomaterials for Cardiovascular Diseases, a continuous refinement for increasing therapeutic demands. *Front. Cardiovasc. Med.* 2021; 10.3389/fcvm.2021.670964.
25. Amendola, A., Garoffolo, G., Songia, P., Nardacci, R., Ferrari, S., Bernava, G., Canzano, P., Myasoedova, V., Colavita, F., Castilletti, C., Sberna, G., Capobianchi, M.R., Piacentini, M., Agrifoglio, M., Colombo, G.I., Poggio, P. and **Pesce, M***. Human cardiosphere-derived stromal cells exposed to SARS-CoV-2 evolve into hyper-inflammatory/pro-fibrotic phenotype and produce infective viral particles depending on the levels of ACE2 receptor expression. *Cardiovasc. Res.* 2021; 10.1093/cvr/cvab082.
26. Poggio, P., Songia, P., Vavassori, C., Ricci, V., Banfi, S., Barbieri, S.S., Garoffolo, G., Myasoedova V.A., Piacentini, L., Raucci, A., Scopece, A., Sommariva, E., Vinci, M.C., Carcione, D., Biondi, M.L., Mancini, M.E., Formenti, A., Andreinini D., Assanelli, E.M., Agostoni P., Camera, M., Colombo, G.I. and **Pesce, M***. Digital PCR for high sensitivity viral detection in false-negative SARS-CoV-2 patients. *Sc. Rep.* 2021; 10.1038/s41598-021-83723-x.
27. Rios, M.R., Garoffolo, G., Rinaldi, G., Megia-Fernandez, A., Ferrari, S., Calum, R.T., Rossi, A.G., **Pesce, M.** and Bradley, M. A Fluorogenic Peptide-Based Smartprobe for the Detection of Neutrophil Extracellular Traps and Inflammation. *Chem. Commun.* 2021; 10.1039/D0CC07028A.
28. Perrino, C., Ferdinandy, P., Bøtker, H.E., Brundel B., Collins, P., Davidson S.M., den Ruijter, H.M., Engel, F.B., Gerds, E., Girao H.,

- Gyöngyösi, M., Hausenloy, D., Lecour, S., Madonna, R., Marber, M., Murphy, E., **Pesce, M.**, Regitz-Zagrosek, V., Sluijter, J.P.G., Steffens, S., Gollmann-Tepeköylü, C., Van Laake, L.W., Van Linthout, S., Schulz, R. and Ytrehus K. Improving Translational Research in Sex-specific Effects of Comorbidities and Risk Factors in Ischemic Heart Disease and Cardioprotection: Position Paper and Recommendations of the ESC Working Group on Cellular Biology of the Heart. *Cardiovasc. Res.* 2021, 117(2), 367-385. 10.1093/cvr/cvaa155.
29. Garoffolo, G., Ferrari, S., Rizzi, S., Barbuto, M., Bernava, G. and **Pesce, M.** Harnessing Mechanosensation in next generation Cardiovascular Tissue Engineering. *Biomolecules.* 2020. 10.3390/biom10101419.
30. **Pesce, M.**, Bär, C., Madonna, R. and Thum, T. Debating new strategies for cardiac protection in the ageing heart in Naples, Italy: News from the joint meeting of the ESC Working Groups of Myocardial Function and Cell Biology of the Heart. *Cardiovasc. Res.* 2020; 10.1093/cvr/cvaa218.
31. Ruiz-Meana, M., Bou-Teen, D., Ferdinandy, P., Gyongyosi, M., **Pesce, M.**, Perrino, C., Schulz, R., Sluijter, J., Tocchetti C.G., Thum, T. and Madonna, R. Cardiomyocyte ageing and cardioprotection: Update from the ESC Working Groups Cell Biology of the Heart and Myocardial Function. *Cardiovasc. Res.* 2020; 10.1093/cvr/cvaa132/5834716.
32. Gaetani, R., Zizzi, E.A., Deriu, M.A., Morbiducci, U., **Pesce, M.** and Messina, E. When stiffness matters: mechanosensing in heart development and disease. *Front. Cell. Dev. Biol.* 2020; 10.3389/fcell.2020.00334.
33. Amadeo, F., Barbuto, M., Bernava, G., Savini, N., Brioschi, M., Rizzi, S., Banfi, C., Polvani, G. and **Pesce, M***. Culture into perfusion-assisted bioreactor promotes valve-like tissue maturation of recellularized pericardial membrane. *Front. Cardiovasc. Med.* 2020; 10.3389/fcvm.2020.00080.
34. Garoffolo G., Ruitter M.S., Piola M., Brioschi M., Thomas A.C., Agrifoglio M., Polvani G., Coppadoro L., Zoli S., Saccu C., Spinetti G., Banfi C., Fiore G.B., Madeddu P., Soncini M., **Pesce, M***. Coronary artery mechanics induces human saphenous vein remodelling via recruitment of adventitial myofibroblast-like cells mediated by Thrombospondin-1. *Theranostics* 2020, 10(6): 2597-2611, 10.7150/thno.40595.
35. Ferrari, S. and **Pesce, M***. Cell-based mechanosensation, epigenetics and non-coding RNAs in progression of cardiac fibrosis. *Int. J. Mol. Sci.*, 2019, 21(1), 10.3390/ijms21010028
36. Garoffolo, G. and **Pesce, M.** Mechanotransduction in the cardiovascular system: from developmental origins to homeostasis and pathology. *Cells*, 2019, 8(12), 1607, 10.3390/cells8121607
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39. Madonna, R., Van Laake L.W., Botker H.E., Davidson S., De Caterina R., Engel F., Eschenhagen, T., Fernandez-Aviles F., Hausenloy D.J., Hulot J.-H., Lecour S., Leor J., Menachè P., **Pesce, M.**, Perrino, C., Prunier, F., Van Linthout, S., Ytrehus K., Zimmermann W.H., Ferdinandy, P., Sluijter, J.P.G. ESC Working Group on Cellular Biology of the Heart: Tissue Engineering and Cell-Based Therapies for Cardiac Repair in Ischemic Heart Disease and Heart Failure. *Cardiovasc. Res.* 2019, 115(3):488-500.
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42. Garoffolo, G., Madonna, R., De Caterina, R. and **Pesce, M.***. Cell based mechanosensing in vascular patho-biology: more than a simple go-with the flow. *Vasc. Pharm.* 2018, 111, 7-14.
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44. Ruiter, M.S. and **Pesce M.***. Mechanotransduction in coronary vein graft disease. *Front. Cardiovasc. Med.* 2018, 5(20).
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48. **Pesce, M.***, Messina, E., Chimenti, I. and Beltrami, A.P. Cardiac mechanoperception: a life-long story from early beats to aging and failure. *Stem Cell Dev.* 2017. 15;26(2):77-90.
49. Piola, M., Ruiter, M., Vismara, R., Mastrullo, V., Agrifoglio, M., Zanobini, M., **Pesce, M.**, Soncini, M. and Fiore, G.B. Full mimicking of coronary hemodynamics for ex-vivo stimulation of human saphenous veins. *Ann. Biom. Eng.* 2017, 45(4):884-897.
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Projects **Individual Funding Resources**

National Grants - Italian Ministry of Health Grants (Ricerca Finalizzata)

- Grant Title: Proliferazione e transdifferenziamento di cellule staminali in terapia cellulare (2001); role: PI of local research Unit; funding received: € 91.929,31
- Grant Title: Differenziamento e transdifferenziamento di cellule progenitrici endoteliali in patologie ischemiche e pazienti a rischio (2003); role: Coordinator; funding received: € 34.900,00
- Grant Title: Terapia cellulare delle ulcere cutanee mediante cellule staminali mesenchimali (2006); role: PI of local research Unit; funding received: € 59.700,00
- Grant Title: The role of mechanobiology in establishment and progression of intima hyperplasia associated to vein coronary bypass grafts disease (2014); role, Coordinator; funding received: € 161.500,00

National Grants - Italian Ministry of Health Grants (Malattie Rare)

- Grant Title: Hypertrophic cardiomyopathy associated to Fabry's disease: cardiomyocytes and cardiac stem cells functional analysis (2006); role: Coordinator; Funding received: € 55.000,00

National Grants - Italian Ministry of Health Grants (ex Art 56)

- Grant Title: Determinanti genici dell'invecchiamento cardiovascolare e diabete (2006); role: co-Applicant; funding received: € 55.000,00
- Grant Title: Impiego di inibitori selettivi di Istone Deacetilasi per la generazione di progenitori multipotenti per il riparo cardiovascolare: studi di base e traslazione clinica; role: co-Applicant (2006); funding received: € 110.000,00

National Grants – Regione Lombardia (POR – FESR 2014-2020)

- Grant Title: Effetti dell'infezione da COVID-19 sull'infiammazione e la fibrosi cardiaca. Modellizzazione in vitro - **Cardio-COV** (no. 1850333; 2020); role: Scientific Coordinator; funding received: € 150.000,00

National grants – PNRR (2022)

- Grant Title: Cell specific targeting of hypoxia-induced miR-210 to modulate inflammation and fibrosis in the ischemic heart (PNRR-MAD-2022-12375790); role: PI of local research Unit; funding received € 200.000,00

International funded Projects - EU Funded projects

- Project Title: Development and preclinical testing of cord blood-derived cell therapy products (2006 – 2009); project Acronym: THERCORD (LSHB-CT-2005-018817); role: Participant; funding received: € 250.000,00
- Project Title: Gene transfer in Skin Equivalents and Stem Cells: Novel Strategies for Chronic Ulcer Repair and Tissue Regeneration (2005 – 2008); project Acronym: ULCER THERAPY (LSHB-CT-2005-512102); role: Participant; funding received: € 311.880,00

- Project Title: Application and process optimization of stem cell products for myocardial Repair (2004-2008); project Acronym SC&CR (LSHB-CT-2004-502988); role: Participant; funding received: € 186.904,00

Collaboration with Pharmaceutical Companies/Industrial Partners

- Silk Biomaterials Srl. Veronesi fellowship for one year junior researcher for assessment of the interactions between silk-based tubular constructs and vascular cells (2018). Funding received: € 20.000
- AorticLab srl. Research contract for proof-of-concept validation of a novel device for aortic valve lithotripsy (2019 – 2021). Funding received € 40.000
- Dompé Farmaceutici. Research contract for in vitro and in vivo validation of pro-angiogenic peptides for the therapy of critical limb ischemia (2021 – 2022). Funding received: € 130.000
- Dompé Farmaceutici. Research contract for assessment of pro-coagulatory activity of SARS-CoV-2 Spike proteins and relative mutants (2022). Funding received: € 80.000

Memberships

Membership of Professional/Learning Societies – Working Groups

- European Society of Cardiology (ESC) – Professional Member (ESC ID: 153734)
- ESC - Working Group on Cellular Biology of the Heart (WG02/153734/20160907). **From July 2018 Member of the WG Nucleus. From 2022 Chairperson Elect (2022 – 2024).**
- ESC – Working Group on Atherosclerosis & Vascular Biology (WG23/705033/20150917)
- ESC - Council on Valvular Heart Disease
- ESC – Heart Failure Association (HFA)

Regulatory activities

- Validation runs of cell therapy products. GMP-compliant Standard Operational Procedures for certification of PTC133 products (human bone marrow-derived CD133⁺ cells) for human angiogenesis trial in patients with refractory angina. Refs: Gaipa et al., *J. Cell. Mol. Med.* 2010; 14(6B), 1619-1634.
- Member of the European Commission Screening Panel (EXPAMED) in the field of Medical Devices (period 03/08/2020 – 02/08/2026).

Other Relevant Information