

Professor Mauro Giacca
Brief Curriculum Vitae



PERSONAL DATA. Born in Trieste, Italy. Married with two children.

ORCID ID: 0000-0003-2927-7225

CURRENT POSITION. Since 2005, Full Professor (Professore Ordinario) of Molecular Biology (BIO/11), University of Trieste, Italy. Since 2019, Professor of Cardiovascular Sciences, BHF Centre for Research Excellence, King's College London, UK.

EDUCATION. 1984, Degree in Medicine; Faculty of Medicine, University of Trieste, Italy. 1985, Professional License; registered to the Medical Doctors and Surgeons Board, Italy. 1989, Ph.D. in Microbiology and Virology; University of Genoa, Italy.

PAST POSITIONS. 2014-2019, Director-General, International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy (ICGEB is an International Organisation for research and training in the United Nations common system). 2004-14, Director, Italian Component of ICGEB, Trieste Italy. 2000-04, Founder and Director, Molecular Biology Laboratory of the Scuola Normale Superiore, in Pisa, Italy. 1990-1994, Staff Scientist, ICGEB Trieste. 1995-2019, Group Leader, Molecular Medicine Laboratory, ICGEB Trieste, Italy.

COMMISSIONS OF TRUST (selected). 2024-26, Chair of the Cardiovascular Gene & Cell Therapy Committee of the American Society of Gene and Cell Therapy (ASGCT). 2022-, Member of the Telethon Italy Scientific Committee. 2022-26, Member of the European Society of Cardiology (ESC) Council Board - Council on Basic Cardiovascular Science. 2021, elected Fellow of The Academy of Medical Sciences (FMedSci), United Kingdom. 2021-23, President of the International Society for Heart Research (ISHR), European Section. 2021, elected Fellow of International Society of Heat Research (FISHR). 2020-, member of the Scientific Advisory Board, Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), Madrid, Spain. 2019-, member of the Scientific Advisory Board, Scuola Normale Superiore, Pisa, Italy. 2019-, member of the Steering Group of the King's College London BHF Centre of Excellence on Heart Failure. 2016-, elected member of the Council of the ISHR-European Section. 2015-, member of the International Governing Board of the International Centre for Biotechnology at the University of Nigeria Nsukka (UNN) of UNESCO. 2014-19, elected member of the Nucleus of the Working Group on Myocardial Function of the European Society of Cardiology (ESC). 2013-19, member of the Ethics Committee of the Regione Friuli Venezia Giulia, Italy. 2012-16, Expert Member in the National Committee for Biotechnology, Biosafety and Life Sciences (CNBBSV), an advisory body to the President of the Council of Ministries of the Republic of Italy. 2005-10, member of the Scientific Council of the National Center for Genetic Engineering and Biotechnology (BIOTEC) of Bangkok, Thailand. 2001-05, member of the Executive Committee of NEST (National Enterprise for NanoScience and NanoTechnology) at the Scuola Normale Superiore in Pisa, Italy.

HONOURS AND AWARDS. 2024, Doctoral Degree (*Doctor medicine*) *honoris causa*, Faculty of Medicine, Goethe University of Frankfurt, Germany. 2023, Brutsaert Award, Heart Failure Association (HFA) of the European Society of Cardiology (ESC). 2020, The Janice Pfeffer Distinguished Lecture Award of the International Society for Heart Research (ISHR). 2018, Robert Reneman Lecture Prize 2018. CARIM 2018. Maastricht, The Netherlands. 2011, San Giusto d'Oro Prize from the City of Trieste. The most important award given by the Municipality of Trieste, Italy to a citizen with outstanding international recognition. 2007, Lenghi-Magrassi International prize for outstanding research in virology, Accademia Nazionale dei Lincei, Italy. 1993, TOYP (To-the-Outstanding Young Person) Prize for scientific Research, Junior Chamber Italy.

MANAGERIAL ACTIVITY. 2021-, Head, School of Cardiovascular Medicine & Sciences, King's College London. 2025-, Director, MRC/BHF Centre of Excellence in Advanced Cardiac Therapies (REACT). 2014-19, Director-General of the International Centre for Genetic Engineering and Biotechnology (ICGEB), with top managerial responsibilities over the three seats of the Centre in Trieste, Italy, New Delhi, India and Cape Town, South Africa. 2004-2014, Director of ICGEB Italian Component, Trieste, Italy.

TEACHING AND MENTORING. Since 2019, Professor of Cardiovascular Sciences, King's College London, London, UK. Since 2005, Full Professor of Molecular Biology at the Department of Medical Sciences of the University of Trieste, Italy. 2000-2005, Associate Professor of Molecular Biology at the Scuola Normale Superiore in Pisa, Italy. In his career, he has supervised the activity of over 100 undergraduate students, PhD and MD students, and post-docs. Several of his former collaborators hold positions of responsibility in various research institutions at the international level. External examiner of PhD students from Universities in Italy, Portugal, Switzerland, France, Sweden and the United Kingdom.

EDITORIAL BOARDS. Circulation Research (2019-, Guest Editor), Cardiovascular Research (2017-, Associate Editor), Molecular Therapy (2013), Transcription (2009-15), Retrovirology (2009-18), BCM Infectious Diseases (2008-, Editorial Advisor), Journal of Molecular Medicine (2007-10), Genome Letters (2006-13).

REVIEWER ACTIVITY. Reviewer for over 30 peer-reviewed international journals in the fields of gene therapy, stem cell research and cardiovascular diseases. These include Nature, Nature Medicine, New England Journal of Medicine, Nature Biotechnology, Science, Science Translational Medicine, The Lancet, Circulation and others. Member of Site Visit Panels for various research centres and PIs across Europe. Member of the evaluation committees of various granting programs, including calls from the European Commission (Horizon Programmes, including ERC) and numerous funding agencies in various European countries.

SCIENTIFIC INTERESTS. His research interest focuses on the development of advanced therapies for cardiovascular disorders, in particular for cardiac repair, regeneration and gene editing. He has an over 30 year experience in the development of viral vectors for gene therapy (in particular, AAV) and in HIV molecular biology (mechanisms of viral latency). During the COVID-19 pandemic period, he has investigated the mechanisms that regulate SARS-CoV-2 infection and has identified drugs that block viral Spike-induced pathologic activity.

RESEARCH ACHIEVEMENTS. Highly Cited Researcher 2023 (Clarivate). Top 2% world scientists 2024 (Stanford/Elsevier). Over 460 papers in peer-reviewed international journals (Citations: >28,000; H index: 88 - Scopus; H index: 106 - Google Scholar). The journals in which he has published include Nature, Science, Cell, Nature Med, Science Transl Med, Circulation, Circ Res, J Clin Invest, and others. He is regularly invited to present his research in seminars and meetings internationally.

GRANTS. Since 2000, over 50 grants for his research activity. These include three consecutive European Research Council (ERC) Advanced Investigator Grants, two British Heart Foundation (BHF) Programme Grants, two consecutive Fondation Leducq Transatlantic Network of Excellence grants and one large grant (£50M) from MRC/BHF for the creation of the MRC/BHF Centre of Research Excellence in Advanced Cardiac Therapies (REACT).

RELATIONSHIP WITH INDUSTRY. Named as an inventor in over 15 patents in the biomedical field. Co-founder and Board member (2020-24) of Purespring Therapeutics Inc, London (AAV gene therapy of the kidney). Founder and Board member (2021-24) of Forcefield Therapeutics Inc, London (cardioprotective therapeutics). Founder and Board member (2021-) of Heqet Therapeutics, Torino (RNAs for cardiac regeneration).

PUBLIC ENGAGEMENT. Active in the dissemination of science for the lay public. He is the creator of “*Science & The City*”, a series of public events in Trieste, Italy since 2013. Since 2011, he holds a weekly column “*Al microscopio*” (*Under the microscope*) in the Italian newspaper “*Il Piccolo*”, where he discusses scientific topics. Since 2013, he is a registered member of the National Board of Journalist of Italy (N. 152255).

PUBLICATIONS (*selected*)

- Secco, I., Backovic, A., Tomczyk, M., Mura, A., Li, G., Bortolotti, F., Vodret, S., Dal Ferro, M., Chiavacci, E., Zentilin, L., Sinagra, G., Zacchigna, S., Mano, M., Giacca, M. 2025. *Genetic tracing and topography of spontaneous and stimulated cardiac regeneration in mice.* **Nat Cardiovasc Res**, 4, 397-411.
- Bussani, R., Zentilin, L., Correa, R., Colliva, A., Silvestri, F., Zacchigna, S., Collesi, C., Giacca, M. 2023. *Persistent SARS-CoV-2 infection in patients seemingly recovered from COVID-19.* **J Pathol** 259, 254-263.
- Shah, A.M., Giacca, M. 2022. *Small non-coding RNA therapeutics for cardiovascular disease.* **Eur Heart J** 43, 4548-4561.
- Ruozzi, G., Bortolotti, F., Mura, A., Tomczyk, M., Falcione, A., Martinelli, V., Vodret, S., Braga, L., Dal Ferro, M., Cannata, A., Zentilin, L., Sinagra, G., Zacchigna, S., Giacca, M. 2022. *Cardioprotective factors against myocardial infarction selected in vivo from an AAV secretome library.* **Sci Transl Med** 14, eabo0699.
- Giacca, M., Shah, A.M. 2022. *The pathological maelstrom of COVID-19 and cardiovascular disease.* **Nature Cardiovasc Res** 1, 200–210.
- Braga, L., Ali, H., Secco, I., Chiavacci, E., Neves, G., Goldhill, D., Penn, R., Jimenez-Guardeño, J., Ortega-Prieto, A., Bussani, R., Cannata, A., Rizzari, G., Collesi, C., Schneider, E., Arosio, D., Shah, A.M., Barclay, W., Malim, M., Burrone, J., Giacca, M. 2021. *Drugs that inhibit TMEM16 proteins block SARS-CoV-2 Spike-induced syncytia.* **Nature**, 594, 88-93.
- Bussani, R., Schneider, E., Zentilin, L., Collesi, C., Ali, H., Braga, L., Volpe, M.C., Colliva, A., Zanonati, F., Berlot, G., Silvestri, F., Zacchigna, S., Giacca, M. 2020. *Persistence of viral RNA, pneumocyte syncytia and thrombosis are hallmarks of advanced COVID-19 pathology.* **Lancet EBioMedicine**, 103104.
- Cannata, A., Ali, H., Sinagra, G., Giacca, M. 2020. *Gene Therapy for the Heart Lessons Learned and Future Perspectives.* **Circ Res** 126, 1394-1414.
- Torrini, C., Cubero, R.J., Dirx, E., Braga, L., Ali, H., Prosdocimo, G., Gutierrez, M.I., Collesi, C., Licastro, D., Zentilin, L., Mano, M., Zacchigna, S., Vendruscolo, M., Marsili, M., Samal, A., Giacca, M. 2019. *Common Regulatory Pathways Mediate Activity of MicroRNAs Inducing Cardiomyocyte Proliferation.* **Cell Rep** 27, 2759-2771 e5.
- Gabisonia, K., Prosdocimo, G., Aquaro, G.D., Carlucci, L., Zentilin, L., Secco, I., Ali, H., Braga, L., Gorgodze, N., Bernini, F., Burchielli, S., Collesi, C., Zandona, L., Sinagra, G., Piacenti, M., Zacchigna, S., Bussani, R., Recchia, F.A., Giacca, M. 2019. *MicroRNA therapy stimulates uncontrolled cardiac repair after myocardial infarction in pigs.* **Nature** 569, 418-422.
- Ali, H., Mano, M., Braga, L., Naseem, A., Marini, B., Vu, D.M., Collesi, C., Meroni, G., Lusic, M., Giacca, M. 2019. *Cellular TRIM33 restrains HIV-1 infection by targeting viral integrase for proteasomal degradation.* **Nat Commun** 10, 926.
- Zacchigna, S., Martinelli, V., Moimas, S., Colliva, A., Anzini, M., Nordio, A., Costa, A., Rehman, M., Vodret, S., Pierro, C., Colussi, G., Zentilin, L., Gutierrez, M.I., Dirx, E., Long, C., Sinagra, G., Klatzmann, D., Giacca, M. 2018. *Paracrine effect of regulatory T cells promotes cardiomyocyte proliferation during pregnancy and after myocardial infarction.* **Nat Commun** 9, 2432.
- Lesizza, P., Prosdocimo, G., Martinelli, V., Sinagra, G., Zacchigna, S., Giacca, M. 2017. *Single-Dose Intracardiac Injection of Pro-Regenerative MicroRNAs Improves Cardiac Function After Myocardial Infarction.* **Circ Res** 120, 1298-1304.
- Bortolotti, F., Ruozzi, G., Falcione, A., Doimo, S., Dal Ferro, M., Lesizza, P., Zentilin, L., Banks, L., Zacchigna, S., Giacca, M. 2017. *In Vivo Functional Selection Identifies Cardiotrophin-1 as a Cardiac Engraftment Factor for Mesenchymal Stromal Cells.* **Circulation** 136, 1509-1524.
- Giacca, M. 2016. *HIV Latency TORn Down.* **Cell Host Microbe** 20, 700-702.
- Ruozzi, G., Bortolotti, F., Falcione, A., Dal Ferro, M., Ukovich, L., Macedo, A., Zentilin, L.,

- Filigheddu, N., Gortan Cappellari, G., Baldini, G., Zweyer, M., Barazzoni, R., Graziani, A., Zacchigna, S., Giacca, M. 2015. *AAV-mediated in vivo functional selection of tissue-protective factors against ischaemia*. **Nat Commun** 6, 7388.
- Marini, B., Kertesz-Farkas, A., Ali, H., Lucic, B., Lisek, K., Manganaro, L., Pongor, S., Luzzati, R., Recchia, A., Mavilio, F., Giacca*, M., Lusic*, M. 2015. *Nuclear architecture dictates HIV-1 integration site selection*. **Nature** 521, 227-31; * last co-authorship.
- Mano, M., Ippodrino, R., Zentilin, L., Zacchigna, S., Giacca, M. 2015. *Genome-wide RNAi screening identifies host restriction factors critical for in vivo AAV transduction*. **Proc Natl Acad Sci USA** 112, 11276-81.
- Zacchigna, S., Zentilin, L., Giacca, M. 2014. *Adeno-associated virus vectors as therapeutic and investigational tools in the cardiovascular system*. **Circ Res** 114, 1827-46.
- Puente, B.N., Kimura, W., Muralidhar, S.A., Moon, J., Amatruda, J.F., Phelps, K.L., Grinsfelder, D., Rothermel, B.A., Chen, R., Garcia, J.A., Santos, C.X., Thet, S., Mori, E., Kinter, M.T., Rindler, P.M., Zacchigna, S., Mukherjee, S., Chen, D.J., Mahmoud, A.I., Giacca, M., Rabinovitch, P.S., Aroumougame, A., Shah, A.M., Szweda, L.I., Sadek, H.A. 2014. *The Oxygen-Rich Postnatal Environment Induces Cardiomyocyte Cell-Cycle Arrest through DNA Damage Response*. **Cell** 157, 565-79.
- Felician, G., Collesi, C., Lusic, M., Martinelli, V., Ferro, M.D., Zentilin, L., Zacchigna, S., Giacca, M. 2014. *Epigenetic modification at Notch responsive promoters blunts efficacy of inducing Notch pathway reactivation after myocardial infarction*. **Circ Res** 115, 636-49.
- Aguirre, A., Montserrat, N., Zacchigna, S., Nivet, E., Hishida, T., Krause, M.N., Kurian, L., Ocampo, A., Vazquez-Ferrer, E., Rodriguez-Esteban, C., Kumar, S., Moresco, J.J., Yates, J.R., 3rd, Campistol, J.M., Sancho-Martinez, I., Giacca, M., Izpisua Belmonte, J.C. 2014. *In vivo activation of a conserved microRNA program induces mammalian heart regeneration*. **Cell Stem Cell** 15, 589-604.
- Lusic, M., Marini, B., Ali, H., Lucic, B., Luzzati, R., Giacca, M. 2013. *Proximity to PML Nuclear Bodies Regulates HIV-1 Latency in CD4+ T Cells*. **Cell Host Microbe** 13, 665-77.
- Eulalio, A., Mano, M., Dal Ferro, M., Zentilin, L., Sinagra, G., Zacchigna, S., Giacca, M. 2012. *Functional screening identifies miRNAs inducing cardiac regeneration*. **Nature** 492, 376-81.
- Allouch, A., Di Primio, C., Alpi, E., Lusic, M., Arosio, D., Giacca, M., Cereseto, A. 2011. *The TRIM Family Protein KAP1 Inhibits HIV-1 Integration*. **Cell Host Microbe** 9, 484-95.
- Pepe, M., Mamdani, M., Zentilin, L., Csiszar, A., Qanud, K., Zacchigna, S., Ungvari, Z., Puligadda, U., Moimas, S., Xu, X., Edwards, J.G., Hintze, T.H., Giacca, M., Recchia, F.A. 2010. *Intramyocardial VEGF-B167 gene delivery delays the progression towards congestive failure in dogs with pacing-induced dilated cardiomyopathy*. **Circ Res** 106, 1893-903.
- Manganaro, L., Lusic, M., Gutierrez, M.I., Cereseto, A., Del Sal, G., Giacca, M. 2010. *Concerted action of cellular JNK and Pin1 restricts HIV-1 genome integration to activated CD4+ T lymphocytes*. **Nature Med** 16, 329-33.
- Paolinelli, R., Mendoza-Maldonado, R., Cereseto, A., Giacca, M. 2009. *Acetylation by GCN5 regulates CDC6 phosphorylation in the S phase of the cell cycle*. **Nature Struct Mol Biol** 16, 412-20.
- Zacchigna, S., Pattarini, L., Zentilin, L., Moimas, S., Carrer, A., Sinigaglia, M., Arsic, N., Tafuro, S., Sinagra, G., Giacca, M. 2008. *Bone marrow cells recruited through the neuropilin-1 receptor promote arterial formation at the sites of adult neoangiogenesis in mice*. **J Clin Invest** 118, 2062-75.
- Collesi, C., Zentilin, L., Sinagra, G., Giacca, M. 2008. *Notch1 signaling stimulates proliferation of immature cardiomyocytes*. **J Cell Biol** 183, 117-28.
- Fischer, C., Jonckx, B., Mazzone, M., Zacchigna, S., Loges, S., Pattarini, L., Chorianopoulos, E., Liesenborghs, L., Koch, M., De Mol, M., Autiero, M., Wyns, S., Plaisance, S., Moons, L., van Rooijen, N., Giacca, M., Stassen, J.M., Dewerchin, M., Collen, D., Carmeliet, P. 2007. *Anti-PlGF Inhibits Growth of VEGF(R)-Inhibitor-Resistant Tumors without Affecting Healthy Vessels*. **Cell** 131, 463-75.
- Zentilin, L., Tafuro, S., Zacchigna, S., Arsic, N., Pattarini, L., Sinigaglia, M., Giacca, M. 2006. *Bone marrow mononuclear cells are recruited to the sites of VEGF-induced neovascularization but are not incorporated into the newly formed vessels*. **Blood** 107, 3546-54.

Todorovic, V., Giadrossi, S., Pelizon, C., Mendoza-Maldonado, R., Masai, H., Giacca, M. 2005. *Human origins of DNA replication selected from a library of nascent DNA*. **Mol Cell** 19, 567-75.

Abdurashidova, G., Deganuto, M., Klima, R., Riva, S., Biamonti, G., Giacca, M., Falaschi, A. 2000. *Start sites of bidirectional DNA synthesis at the human lamin B2 origin*. **Science** 287, 2023-2026.