

CURRICULUM VITAE of MARA BRANCACCIO

Name and surname: Mara Brancaccio

Date of birth: 11/19/1971

Place of birth: Aosta

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Positions and Employment

Full Professor of Applied Biology in the Department of Molecular Biotechnology and Health Sciences, University of Torino.

Head of the Research Unit "Chaperone proteins in cancer growth and progression and in cardioprotection" at the Molecular Biotechnology Center "Guido Tarone", Via Nizza, 52, 10126 Torino.

Member of the Teaching Committee of the PhD Program in Molecular Medicine of the University of Torino.

Instructor in the MD/PhD Program, School of Medicine, University of Torino

Member of the Scientific Committee of the Interdepartmental Molecular Biotechnology Center "Guido Tarone" of the University of Torino.

Member of the Scientific Committee of the Department of Molecular Biotechnology and Health Sciences, University of Torino.

Member of the Commission for the Validation of Student Careers and Transfers of the Medicine and Surgery course of the University of Torino.

Member of the Admissions Committee and Exams Validation Committee of the Molecular Biotechnology course of the University of Torino

Member of the Commission for the admission test to the course in Biotechnology, University of Torino.

Member of the Commission for the verification test of the adequacy of personal preparation for the Master Degree Course in Medical Biotechnology of the University of Torino.

Previous positions, research and education experiences

2005-2016 Founding partner and Director of Research and Development of Target Heart Biotec srl, a spin off of the University of Torino.

2002-2006 SSD BIO/13 Researcher at the Faculty of Medicine and Surgery, Department of Genetics, Biology and Biochemistry, Biology section, University of Torino.

2000-2002 Research fellow at the Department of Genetics, Biology and Biochemistry, Biology section of the University of Torino.

2000 Achievement of the PhD in "Human Biology: molecular and cellular basis" presenting a final dissertation entitled "Melusin is a new specific muscle interactor of the cytoplasmic domain of beta1 integrin "

1997-1998 Adjunct professor of the General Biology course at the Faculty of Psychology, University of Torino.

1995-1999 Four-year PhD student in "Human Biology: molecular and cellular bases" in the Department of Genetics, Biology and Biochemistry, Biology section, Faculty of Medicine, University of Torino.

1996-1997 Research activity at the Harvard Medical School, Massachusetts General Hospital, Charlestown (Boston), USA.

1995 Degree in Biological Sciences at the University of Torino, 110/110 cum laude

Teaching activity

-Cell Biology, Degree of Biotechnology, University of Torino.

-Cell Biology in the course of Biological, Molecular and Human Genetics, Degree in Medicine and Surgery, School of Medicine, University of Torino

-Molecular Dynamics of Cellular Processes in the course of Functional Genomics in the Master Degree in Molecular Biotechnology, University of Torino.

-Applied Biology in the course of Biomedical Sciences, Degree in Neurophysiopathology, Audioprosthesis Techniques and Audiometric Techniques, University of Torino.

-Signaling receptors in pathophysiology, Elective Educational Activity, Degree in Medicine and Surgery, School of Medicine, University of Torino

Research activity

My research interest lies in studying the role of stress proteins, known as "chaperones," in physiology and disease. The main projects in my laboratory focus on investigating roles of chaperones in organismal survival (Ferretti et al., 2010), tumor growth and progression (Fusella et al., 2017, and Seclì et al., 2021), and stress-induced myocardial remodeling (Sorge et al., 2024). We study the mechanisms of action of chaperone proteins and how to leverage their expression to diagnose pathologies, inhibit cancer growth and metastasis formation, and protect the heart from stress.

Past and Present Relevant Research funding

- 2023-2025 PRIN 2022 PNRR "A chaperone network shapes heart resilience during stress and aging"
- 2021-2026 Italian Association for Cancer Research AIRC 2020 "Targeting extracellular HSP90 complexes to fight cancer progression"
- 2018-2021 Piemonte Region - Digital Technology For Lung Cancer Treatment (DEFLeCT)
- 2017-2018 University Research Projects - Year 2016 Compagnia San Paolo "Linking cardiac metabolism to inflammation".
- 2017-2019 PRIN 2015 Ministry of University and Research "Characterization of adaptive or maladaptive influences of innate immune system on cardiac hypertrophic remodeling in response to pressure overload"
- 2015-2017 Italian Association for Cancer Research AIRC 2014 "Morgana, a new metastasis gene in breast cancer"
- 2013-2016 PRIN 2010-2011 Ministry of University and Research "Engineering physiologically and pathologically relevant organ Models for the Investigation of Age-related Diseases (MIND)"
- 2012-2014 Italian Association for Cancer Research AIRC 2011 "Role of morgana/chp-1 in cancer onset and progression"
- 2008-2010 Italian Association for Cancer Research AIRC 2008 "Role of chp-1, a new protein controlling centrosome cycle and genomic stability, in cancer onset and progression"
- 2006-2009 Regional Call for Industrial Research and Precompetitive Development 2006 "Caramel-Melusin as a therapeutical target for dialted cardiomyopathy"
- 2007-2008 PRIN 2006 Ministry of University and Research "Analysis of melusin molecular mechanism in sustaining heart function"
- 2005-2008 CIPE Regione Piemonte 2004 "Analysis of the role of melusin in the diabetic nephropathy"

Patents

- 03/12/2008 - Granting of the international patent WO 2004/056176 A1 "Melusin, a muscle specific protein, as a drug target for prevention and treatment of heart failure and applications thereof"
- 26/02/2014 - Granting of the international patent EP2386570 B1 "Recombinant melusin fusion protein as pharmacological agent in the treatment of heart pathologies and compositions thereof"
- 14/09/2020 - Filing of invention patent application n. 102020000021667 "Anti-Morgana binding protein for the treatment of tumors" at the Italian Patent and Trademark Office of the Ministry of Economic Development.
- 14/09/2021 - Filing of international patent application PCT/EP2021/075175 "Anti-Morgana monoclonal antibody for the treatment of tumors" at the European Patent Office.

Bibliometric indexes

Citations: 2890, documents: 69, h-index:30

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=6701338824>

Journal Reviewer

Reviewer for several scientific journals, including Journal of Clinical Investigation, Blood, Cell Death and Differentiation, Oncogene, Cardiovascular Research, Frontiers in Immunology, Acta Physiologica.

Publications:

Links to all publications: <https://pubmed.ncbi.nlm.nih.gov/?term=Mara+Brancaccio>

Selected publication:

1. Poggio P, Rocca S, Fusella F, Ferretti R, Ala U, D'Anna F, Giugliano E, Panuzzo C, Fontana D, Palumbo V, Carrà G, Taverna D, Gambacorti-Passerini C, Saglio G, Fava C, Piazza R, Morotti A, Orso F, Brancaccio M. miR-15a targets the HSP90 co-chaperone Morgana in chronic myeloid leukemia. *Sci Rep*. 2024 Jul 2;14(1):15089. doi: 10.1038/s41598-024-65404-7. PMID: 38956394; PMCID: PMC11220062.
2. van Oosten-Hawle P, Backe SJ, Ben-Zvi A, Bourboulia D, Brancaccio M, Brodsky J, Clark M, Colombo G, Cox MB, De Los Rios P, Echtenkamp F, Edkins A, Freeman B, Goloubinoff P, Houry W, Johnson J, LaPointe P, Li W, Mezger V, Neckers L, Nillegoda NB, Prahlad V, Reitzel A, Scherz-Shouval R, Sistonen L, Tsai FTF, Woodford MR, Mollapour M, Truman AW. Second Virtual International Symposium on Cellular and Organismal Stress Responses, September 8-9, 2022. *Cell Stress Chaperones*. 2023 Jan;28(1):1-9. doi: 10.1007/s12192-022-01318-5. Epub 2023 Jan 5. PMID: 36602710; PMCID: PMC9877255.
3. Arina P, Sorge M, Gallo A, Di Mauro V, Vitale N, Cappello P, Brazzi L, Barandalla-Sobrados M, Cimino J, Ranieri VM, Altruda F, Singer M, Catalucci D, Brancaccio M, Fanelli V. Modulation of LTCC Pathways by a Melusin Mimetic Increases Ventricular Contractility During LPS-Induced Cardiomyopathy. *Shock*. 2022 Jun 1;57(6):318-325. doi: 10.1097/SHK.0000000000001926. Epub 2022 Mar 9. PMID: 35271535.
4. Bochicchio MT, Di Battista V, Poggio P, Carrà G, Morotti A, Brancaccio M*, Lucchesi A*. Understanding Aberrant Signaling to Elude Therapy Escape Mechanisms in Myeloproliferative Neoplasms. *Cancers (Basel)*. 2022 Feb 15;14(4):972. doi: 10.3390/cancers14040972. PMID: 35205715; PMCID: PMC8870427 (* co-last authors).
5. Poggio P, Sorge M, Seclì L, Brancaccio M. Extracellular HSP90 Machineries Build Tumor Microenvironment and Boost Cancer Progression. *Front Cell Dev Biol*. 2021 Oct 14;9:735529. doi: 10.3389/fcell.2021.735529. PMID: 34722515.
6. Seclì L, Avalle L, Poggio P, Fragale G, Cannata C, Conti L, Iannucci A, Carrà G, Rubinetto C, Miniscalco B, Hirsch E, Poli V, Morotti A, De Andrea M, Turco E, Cavallo F, Fusella F, Brancaccio M. Targeting the Extracellular HSP90 Co-Chaperone Morgana Inhibits Cancer Cell Migration and Promotes Anticancer Immunity. *Cancer Res*. 2021 Sep 15;81(18):4794-4807. doi: 10.1158/0008-5472.CAN-20-3150. Epub 2021 Jun 30. PMID: 34193441.

7. Seclì L, Fusella F, Avalle L, Brancaccio M. The dark-side of the outside: how extracellular heat shock proteins promote cancer. *Cell Mol Life Sci*. 2021 May;78(9):4069-4083. doi: 10.1007/s00018-021-03764-3. Epub 2021 Feb 5. PMID: 33544155
8. Gorza L, Sorge M, Seclì L, Brancaccio M. Master Regulators of Muscle Atrophy: Role of Costamere Components. *Cells*. 2021 Jan 3;10(1):E61. doi: 10.3390/cells10010061. PMID: 33401549
9. Seclì L, Sorge M, Morotti A, Brancaccio M. Blocking Extracellular Chaperones to Improve Cardiac Regeneration. *Front Bioeng Biotechnol*. 2020 May 26;8:411. doi: 10.3389/fbioe.2020.00411. PMID: 32528937; PMCID: PMC7264090
10. Vitadello M, Sorge M, Percivalle E, Germinario E, Danieli-Betto D, Turco E, Tarone G, Brancaccio M, Gorza L. Loss of melusin is a novel, neuronal NO synthase/FoxO3-independent master switch of unloading-induced muscle atrophy. *J Cachexia Sarcopenia Muscle*. 2020 Mar 10. doi: 10.1002/jcsm.12546. PubMed PMID: 32154658.
11. Fusella F, Seclì L, Cannata C, Brancaccio M. The one thousand and one chaperones of the NF- κ B pathway. *Cell Mol Life Sci*. 2019 Dec 6. doi: 10.1007/s00018-019-03402-z. Review. PubMed PMID: 31811308.
12. Brancaccio M, Pirozzi F, Hirsch E, Ghigo A. Mechanisms underlying the cross-talk between heart and cancer. *J Physiol*. 2020 Jul;598(14):3015-3027. doi: 10.1113/JP276746. Epub 2019 Jul 26. PMID: 31278748.
13. Fusella F, Seclì L, Brancaccio M. Escaping NK cells and recruiting neutrophils: How Morgana/NF- κ B signaling promotes metastasis. *Mol Cell Oncol*. 2018 Jan 30;5(3):e1432258. doi: 10.1080/23723556.2018.1432258. eCollection 2018. PubMed PMID: 30250889.
14. Penna C, Sorge M, Femminò S, Pagliaro P, Brancaccio M. Redox Aspects of Chaperones in Cardiac Function. *Front Physiol*. 2018 Mar 16;9:216. doi: 10.3389/fphys.2018.00216. PubMed PMID: 29615920.
15. Rocca S, Carrà G, Poggio P, Morotti A, Brancaccio M. Targeting few to help hundreds: JAK, MAPK and ROCK pathways as druggable targets in atypical chronic myeloid leukemia. *Mol Cancer*. 2018 Feb 19;17(1):40. doi:10.1186/s12943-018-0774-4. Review. PubMed PMID: 29455651.
16. Fusella F, Seclì L, Busso E, Krepelova A, Moiso E, Rocca S, Conti L, Annaratone L, Rubinetto C, Mello-Grand M, Singh V, Chiorino G, Silengo L, Altruda F, Turco E, Morotti A, Oliviero S, Castellano I, Cavallo F, Provero P, Tarone G, Brancaccio M. The IKK/NF- κ B signaling pathway requires Morgana to drive breast cancer metastasis. *Nat Commun*. 2017 Nov 21;8(1):1636. doi:10.1038/s41467-017-01829-1. PubMed PMID: 29158506.
17. Morotti A, Rocca S, Carrà G, Saglio G, Brancaccio M. Modeling myeloproliferative neoplasms: From mutations to mouse models and back again. *Blood Rev*. 2017 May;31(3):139-150. doi: 10.1016/j.blre.2016.11.004. Epub 2016 Nov 24. PMID: 27899218.

18. Sorge M, Brancaccio M. Melusin Promotes a Protective Signal Transduction Cascade in Stressed Hearts. *Front Mol Biosci*. 2016 Sep 12;3:53. doi: 10.3389/fmolb.2016.00053. PMID: 27672636; PMCID: PMC5018970.
19. Brancaccio M, Rocca S, Seclì L, Busso E, Fusella F. The double face of Morgana in tumorigenesis. *Oncotarget*. 2015 Dec 15;6(40):42603-12. doi: 10.18632/oncotarget.6058. PMID: 26460959; PMCID: PMC4767456.
20. Di Savino A, Panuzzo C, Rocca S, Familiari U, Piazza R, Crivellaro S, Carrà G, Ferretti R, Fusella F, Giugliano E, Camporeale A, Franco I, Miniscalco B, Cutrin JC, Turco E, Silengo L, Hirsch E, Rege-Cambrin G, Gambacorti-Passerini C, Pandolfi PP, Papotti M, Saglio G, Tarone G, Morotti A, Brancaccio M. Morgana acts as an oncosuppressor in chronic myeloid leukemia. *Blood*. 2015 Apr 2;125(14):2245-53. doi: 10.1182/blood-2014-05-575001. Epub 2015 Feb 12. PMID: 25678499.
21. Tarone G, Brancaccio M. The muscle-specific chaperone protein melusin is a potent cardioprotective agent. *Basic Res Cardiol*. 2015 Mar;110(2):10. doi: 10.1007/s00395-015-0466-9. Epub 2015 Feb 5. PMID: 25653116.
22. Penna C*, Brancaccio M*, Tullio F, Rubinetto C, Perrelli MG, Angotti C, Pagliaro P, Tarone G. Overexpression of the muscle-specific protein, melusin, protects from cardiac ischemia/reperfusion injury. *Basic Res Cardiol*. 2014 Jul;109(4):418. doi: 10.1007/s00395-014-0418-9. Epub 2014 May 25. PMID: 24859929 (* co-first authors).
23. Fusella F, Ferretti R, Recupero D, Rocca S, Di Savino A, Tornillo G, Silengo L, Turco E, Cabodi S, Provero P, Pandolfi PP, Sapino A, Tarone G, Brancaccio M. Morgana acts as a proto-oncogene through inhibition of a ROCK-PTEN pathway. *J Pathol*. 2014 Oct;234(2):152-63. doi: 10.1002/path.4341. Epub 2014 Aug 6. PMID: 24615293.
24. Tarone G, Brancaccio M. Keep your heart in shape: molecular chaperone networks for treating heart disease. *Cardiovasc Res*. 2014 Jun 1;102(3):346-61. doi: 10.1093/cvr/cvu049. Epub 2014 Feb 28. PMID: 24585203.
25. Tarone G, Sbroggiò M, Brancaccio M. Key role of ERK1/2 molecular scaffolds in heart pathology. *Cell Mol Life Sci*. 2013 Nov;70(21):4047-54. doi: 10.1007/s00018-013-1321-5. Epub 2013 Mar 27. PMID: 23532408.
26. Ferretti R, Sbroggiò M, Di Savino A, Fusella F, Bertero A, Michowski W, Tarone G, Brancaccio M. Morgana and melusin: two fairies chaperoning signal transduction. *Cell Cycle*. 2011 Nov 1;10(21):3678-83. doi: 10.4161/cc.10.21.18202. Epub 2011 Nov 1. 2037254.
27. Sbroggiò M, Bertero A, Velasco S, Fusella F, De Blasio E, Bahou WF, Silengo L, Turco E, Brancaccio M, Tarone G. ERK1/2 activation in heart is controlled by melusin, focal adhesion kinase and the scaffold protein IQGAP1. *J Cell Sci*. 2011 Oct 15;124(Pt 20):3515-24. doi: 10.1242/jcs.091140. PMID: 22010199; PMCID: PMC3706035.

28. Sbroggiò M, Carnevale D, Bertero A, Cifelli G, De Blasio E, Mascio G, Hirsch E, Bahou WF, Turco E, Silengo L, Brancaccio M, Lembo G, Tarone G. IQGAP1 regulates ERK1/2 and AKT signalling in the heart and sustains functional remodelling upon pressure overload. *Cardiovasc Res*. 2011 Aug 1;91(3):456-64. doi: 10.1093/cvr/cvr103. Epub 2011 Apr 14. PMID: 21493702; PMCID: PMC3294280.
29. Ferretti R, Palumbo V, Di Savino A, Velasco S, Sbroggiò M, Sportoletti P, Micale L, Turco E, Silengo L, Palumbo G, Hirsch E, Teruya-Feldstein J, Bonaccorsi S, Pandolfi PP, Gatti M, Tarone G, Brancaccio M. Morgana/chp-1, a ROCK inhibitor involved in centrosome duplication and tumorigenesis. *Dev Cell*. 2010 Mar 16;18(3):486-95. doi: 10.1016/j.devcel.2009.12.020. PMID: 20230755.
30. Brancaccio M, Turco E, Hirsch E. Tissue-specific KO of ECM proteins. *Methods Mol Biol*. 2009;522:15-50. In: Charles H. Streuli and Michael E. Grant. *Extracellular Matrix Protocols*. vol. 522, p. 15-50, Totowa: Publisher Humana Press, ISBN: 9781588299840, doi: 10.1007/978-1-59745-413-1_2. PMID: 19247610.
31. Sbroggiò M, Ferretti R, Percivalle E, Gutkowska M, Zylicz A, Michowski W, Kuznicki J, Accornero F, Pacchioni B, Lanfranchi G, Hamm J, Turco E, Silengo L, Tarone G, Brancaccio M. The mammalian CHORD-containing protein melusin is a stress response protein interacting with Hsp90 and Sgt1. *FEBS Lett*. 2008 Jun 11;582(13):1788-94. doi: 10.1016/j.febslet.2008.04.058. Epub 2008 May 12. PMID: 18474241.
32. Brancaccio M, Hirsch E, Notte A, Selvetella G, Lembo G, Tarone G. Integrin signalling: the tug-of-war in heart hypertrophy. *Cardiovasc Res*. 2006 Jun 1;70(3):422-33. doi: 10.1016/j.cardiores.2005.12.015. Epub 2006 Feb 8. Erratum in: *Cardiovasc Res*. 2006 Dec 1;72(3):494. PMID: 16466704.
33. De Acetis M, Notte A, Accornero F, Selvetella G, Brancaccio M, Vecchione C, Sbroggiò M, Collino F, Pacchioni B, Lanfranchi G, Aretini A, Ferretti R, Maffei A, Altruda F, Silengo L, Tarone G, Lembo G. Cardiac overexpression of melusin protects from dilated cardiomyopathy due to long-standing pressure overload. *Circ Res*. 2005 May 27;96(10):1087-94. doi: 10.1161/01.RES.0000168028.36081.e0. Epub 2005 Apr 28. Erratum in: *Circ Res*. 2005 Jul 8;97(1):e5. PMID: 15860758.
34. Vecchione C, Patrucco E, Marino G, Barberis L, Poulet R, Aretini A, Maffei A, Gentile MT, Storto M, Azzolino O, Brancaccio M, Colussi GL, Bettarini U, Altruda F, Silengo L, Tarone G, Wymann MP, Hirsch E, Lembo G. Protection from angiotensin II-mediated vasculotoxic and hypertensive response in mice lacking PI3Kgamma. *J Exp Med*. 2005 Apr 18;201(8):1217-28. doi: 10.1084/jem.20040995. Epub 2005 Apr 11. PMID: 15824082; PMCID: PMC2213159.
35. Patrucco E, Notte A, Barberis L, Selvetella G, Maffei A, Brancaccio M, Marengo S, Russo G, Azzolino O, Rybalkin SD, Silengo L, Altruda F, Wetzker R, Wymann MP, Lembo G, Hirsch E. PI3Kgamma modulates the cardiac response to chronic pressure overload by distinct kinase-dependent and -independent effects. *Cell*. 2004 Aug 6;118(3):375-87. doi: 10.1016/j.cell.2004.07.017. PMID: 15294162.

36. Brancaccio M, Menini N, Bongioanni D, Ferretti R, De Acetis M, Silengo L, Tarone G. Chp-1 and melusin, two CHORD containing proteins in vertebrates. FEBS Lett. 2003 Sep 11;551(1-3):47-52. doi: 10.1016/s0014-5793(03)00892-5. PMID: 12965203.
37. Brancaccio M, Fratta L, Notte A, Hirsch E, Poulet R, Guazzone S, De Acetis M, Vecchione C, Marino G, Altruda F, Silengo L, Tarone G, Lembo G. Melusin, a muscle-specific integrin beta1-interacting protein, is required to prevent cardiac failure in response to chronic pressure overload. Nat Med. 2003 Jan;9(1):68-75. doi: 10.1038/nm805. Epub 2002 Dec 23. PMID: 12496958.
38. Brancaccio M, Guazzone S, Menini N, Sibona E, Hirsch E, De Andrea M, Rocchi M, Altruda F, Tarone G, Silengo L. Melusin is a new muscle-specific interactor for beta(1) integrin cytoplasmic domain. J Biol Chem. 1999 Oct 8;274(41):29282-8. doi: 10.1074/jbc.274.41.29282. PMID: 10506186.
39. Brancaccio M, Cabodi S, Belkin AM, Collo G, Koteliansky VE, Tomatis D, Altruda F, Silengo L, Tarone G. Differential onset of expression of alpha 7 and beta 1D integrins during mouse heart and skeletal muscle development. Cell Adhes Commun. 1998 Mar;5(3):193-205. doi: 10.3109/15419069809040291. PMID: 9686317.

Autorizzo il trattamento dei miei dati personali presenti nel curriculum vitae ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali" e del GDPR (Regolamento UE 2016/679).

Torino, 03 settembre 2024

