

CURRICULUM VITAE ET STUDIORUM

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EDUCATION

- **April 2009: PhD in Cellular Biology and Physiology**, Department of Biology, University of Bologna (Italy).
- **March 2005: MSc in Pharmaceutical Biotechnology** (Five Years Academic Degree), Faculty of Mathematics, Physics and Natural Science and Faculty of Pharmacy, University of Bologna.

PROFESSIONAL EXPERIENCE

- **June 2019 – to date:**

Associate Professor of Molecular Biology, Dept. BIOMETEC, Univ. of Catania (Italy).

Scientific interests:

- ✓ **Molecular mechanisms of CNS protection and repair**
- ✓ **Cell-to-cell communication** via extracellular vesicles, in Eukaryota and Bacteria
- ✓ **Parkinson's disease and neuroinflammation**
- ✓ **Glia and neural stem cell biology**
- ✓ **Horizontal transfer of RNAs** (both mRNAs and miRNAs)
- ✓ **Immunometabolism**
- ✓ **Nanotechnologies and Synthetic Biology**

Description of the Research Activities:

The development of new therapies to promote **tissue repair** in central nervous system (CNS) diseases, represents one of the most challenging areas of investigation in the field of **regenerative medicine**.

Parkinson's disease (**PD**), together with Alzheimer's disease, is the most common human neurodegenerative disorder, affecting millions of people worldwide. The vast majority of cases are sporadic and there are no treatments that can halt or reverse the course of PD, yet. Emerging evidence points to reactive **glia** as a pivotal factor in PD. Particularly reactive **astrocytes**, in partnership with microglial cells, can modulate the biology of dopaminergic neurons and adult neural stem cells (**NSCs**) via intercellular signalling, finally mediating **neuroprotection** and **neurorepair**. Nevertheless, a detailed understanding at the molecular level of the mechanisms behind this therapeutic plasticity is still lacking. As such, my first strand of investigation focuses at a novel mechanism of intercellular communication that works through the transfer of extracellular vesicles (**EVs**), including **exosomes**. Recently EVs – small vesicles secreted by every type of cell – have been suggested as novel and important players in promoting cell-to-cell communication. Whether EVs convey bioactive signals between the reactive astrocytes, the damaged neurons and NSCs in PD brain remains largely unknown. To answer these questions, with the support of a team of precious collaborators, my research aims to perform one of the very first **in-depth characterization of EV-mediated intercellular signalling** in the context of PD, taking into account both the content of EVs – in terms of mRNAs, miRNAs and proteins – and their functional impact on relevant target cells (i.e., dopaminergic neurons and NSCs).

Our **long-term goal** is either (i) to enable loading of specific molecules into EVs; or (ii) to develop fully synthetic nanoparticles to treat neurodegenerative diseases.

- **June 2016 – May 2019:**

Assistant Professor of Molecular Biology, Dept. BIOMETEC, Univ. of Catania (Italy).

- **December 2011 – May 2016:**

Research Fellow, Dept. of Clinical Neurosciences, Univ. of Cambridge (UK).

Description of the Research Activities:

Recent evidence indicates that NSCs efficiently protect the CNS from chronic degeneration induced by **inflammation** (such as in multiple sclerosis) both in small rodents and in primates. NSCs show the capacity to engage a complex mechanism of cell-to-cell communication with the host, finally mediating **neuroprotection** and **immunomodulation**, partially via **EV transfer**. With my work I contributed to demonstrate that:

- (i) NSCs secrete vesicles mainly comprising of small EVs;
- (ii) mRNA and protein sorting in EVs/exosomes is regulated by inflammatory cytokines;
- (iii) IFN- γ /Ifngr1 complex on EVs promotes the intercellular induction of Stat1 signalling;
- (iv) EVs are metabolically active and alter enzymatically the metabolic environment;
- (v) Mouse and human NSC-derived EVs are enriched in L-asparaginase activity (via Asrgl1).

Taken together these results revealed a mechanism of **cell-to-cell communication** by which NSCs may signal with the microenvironment via EVs. This is potentially relevant both in physiological conditions (e.g., neurogenesis) and in the context of neurodegenerative diseases.

Supervisor: Stefano Pluchino, MD, PhD.

- **February 2011 – November 2011:**

Postdoc contract (Rapporto di Collaborazione Coordinata e Continuativa a Progetto) with Centro San Raffaele del Monte Tabor Foundation (Milan, Italy); research at the Univ. of Cambridge (see above).

Research project: Mechanisms and implications of "mobile" ncRNAs in neural stem cells.

- **January 2009 – January 2011:**

Postdoc at the Dept. of Biology, Univ. of Bologna.

Subjects of research:

- ✓ MYCN-mediated transcriptional repression in neuroblastoma
- ✓ MYC as a regulator of ABC genes in Chronic Myeloid Leukemia
- ✓ Role of IKAROS in Adult B-Progenitor Acute Lymphoblastic Leukemia
- ✓ Identification of novel miRNAs suppressing BCR-ABL expression in CML

- **January 2006 – December 2008:**

PhD student at the Dept. of Biology, Univ. of Bologna.

PhD thesis: Complexity of MYCN transcriptional function in childhood neuroblastoma.

- **April 2004 – December 2005:**

Undergraduate/graduate student at the Dept. of Biology, Univ. of Bologna.

MSc thesis: Transcriptional induction of TRKA and p75NTR genes in neuroblastoma by histone deacetylase inhibitor Trichostatin A (TSA).

Supervisor: Professor Giovanni Perini, PhD (from April 2004 to January 2011).

PATENTS

- ✓ **Co-inventor patent** "Human asparaginase lacking glutaminase activity" Pub. No.: WO/2018/050918; international application No.: PCT/EP2017/073635; publication date: 22.03.2018; international filing date: 19.09.2017. Pub. No.: WO2018050918A1
- ✓ **Co-inventor patent** "Use of ATP-binding cassette, sub-family C, member 3 as a biomarker for chronic myeloid leukemia patients, to determine the therapeutic efficacy of imatinib or its salt"; international application No.: PCT/US2009/063707; publication date: 14.05.2010; international filing date: 09.11.2009. Pub. No.: WO2010054298A1.

GRANTS, FELLOWSHIPS AND OTHER ACHIEVEMENTS

- ✓ **Participant Clinician Scientist Individual Research Grant** (Sep 2024 – Aug 2027): “*Characterization of the Retinal Microvascular Endothelial Cell Response to Biomechanical Deformation*”. PI: Rachel Chong, PhD (Singapore Eye Research Institute). Dept. BIOMETEC, Univ. of Catania.
- ✓ **Research Unit Leader Piano Nazionale di Ripresa e Resilienza (PNRR) grant**, Programma M6C2, Investimento 2.1 – Next Generation EU (Aug 2024 – Jul 2026): “*A translational approach to characterize the muscle-brain interplay in neurological non-communicable diseases (The M-Brain project)*”. PI: Dr. C. Lunetta (Istituti Clinici Scientifici Maugeri, Milano). Dept. BIOMETEC, Univ. of Catania.
- ✓ **Participant PRIN PNRR 2022, LINEA SUD (Under 40) Grant** (Jul 2024 – Jun 2026): “*The envelope (E) protein of SARS-CoV-2: a key to unlock new insights into Coronavirus disease (COVID-19)*”. PI: Dr. S. Reina, Dept. BIOMETEC, Univ. of Catania.
- ✓ **National Scientific Qualification (ASN) as Professor** (Dec 2023) for the Academic Recruitment Field 05/E2 (Molecular Biology, BIO/11, now BIOS-08/A).
- ✓ **Participant PNRR grant**, Programma M4C2, Investimento 1.3 – Next Generation EU (Nov 2022 – Oct 2025): “*One Health Basic and Translational Actions Addressing Unmet Needs on Emerging Infectious Diseases (INF-ACT)*”. Research Node 3 Leader: Prof. S. Stefani, Dept. BIOMETEC, Univ. of Catania.
- ✓ **Participant “Pia.ce.ri.” grant 2020-2022** (Piano di incentivi per la ricerca di Ateneo, Jan 2021 – Dec 2022): “*VDAC, a cellular hub for the control of energy metabolism and its role in neurodegeneration*”. PI: Prof. V. De Pinto, Dept. BIOMETEC, Univ. of Catania.
- ✓ **Principal Investigator Brains2South grant 2015**, Fondazione con il Sud - Bando Capitale Umano ad Alta Qualificazione (Jan 2017 – Jun 2021): “*Characterization of exosomes as natural messengers of bioactive molecules in the glial-neuronal signaling in Parkinson's disease*”. Dept. BIOMETEC, Univ. of Catania.
- ✓ **National Scientific Qualification (ASN) as Associate Professor** (Apr 2018) for the Academic Recruitment Fields 05/E2 (Molecular Biology, BIO/11, now BIOS-08/A) and 05/F1 (Cellular and Experimental Biology, BIO/13, now BIOS-10/A).
- ✓ **Tenure-Track Position (RTD-B)**, Jun 2016: Chiamata Diretta SSD BIO/11, now BIOS-08/A. Dept. BIOMETEC, Univ. of Catania
- ✓ **Emerging Research Leaders’ Development Programme (ERLDP) 2014**, organised by the Univ. of Cambridge: selected upon application.
- ✓ **Co-applicant Evelyn Trust grant 2013** (Dec 2013 – Nov 2015): “*Cell signalling through secreted extracellular RNAs in neuro-immune interactions*”. PI: Dr. S. Pluchino, Dept. of Clinical Neurosciences, Univ. of Cambridge.
- ✓ Research activity for the **European Research Council (ERC) starting grant 2010** (Feb 2011 – Nov 2015): “*SEcreted Membrane vesicles: role in the therapeutic plasticity of neural StEM cells*”. PI: Dr. S. Pluchino, Dept. of Clinical Neurosciences, Univ. of Cambridge.
- ✓ Research activity for the **Fondazione Italiana Sclerosi Multipla (FISM) grant** (Feb 2011 – Dec 2013): “*Noncoding-RNAs and therapeutic plasticity of neural stem cells*”. PI: Dr. S. Pluchino, Dept. of Clinical Neurosciences, Univ. of Cambridge.
- ✓ **The FEBS Long-Term Fellowship** (Dec 2011 – Nov 2013): “*Mechanisms of mobile ncRNAs in stem cells*.” Dept. of Clinical Neurosciences, Univ. of Cambridge.
- ✓ **“Centro Interdipartimentale di Ricerca sul Cancro Giorgio Prodi” Fellowship** (Jan 2010 – Dec 2010): “*Eradication of acute and chronic leukemic stem cells through interference of the self renewal mediated by the Smo Inhibitors*”. Dept. of Biology, Univ. of Bologna.
- ✓ **NOVARTIS Fellowship** (Jan 2009 – Dec 2009): “*Identification and characterization of microRNAs that block the function of Bcr-Abl in Philadelphia positive leukemias*”. Dept. of Biology, Univ. of Bologna.
- ✓ **NOVARTIS Award “Premio di Operosità”** (Feb 2008): “*Transcriptional mechanisms mediated by oncoprotein N-Myc in neuroblastoma*”. Dept. of Biology, Univ. of Bologna.

PUBLICATIONS

- Scopus ID: 55597087097; Researcher ID: M-7451-2016; Orcid ID: 0000-0003-2146-9329
 - H index (Scopus): 26
 - Total citations (Scopus): 3,086
1. Leggio L, Paternò G, Cavallaro F, Falcone M, Vivarelli S, Manna C, Calogero AE, Cannarella R*, **Iraci N***.
Sperm epigenetics and sperm RNAs as drivers of male infertility: truth or myth?
Mol Cell Biochem. 2025 Feb;480(2):659-682. (PMID: 38717684)
* Co-corresponding authors.
 2. Matera A, Compagnion AC, Pedicone C, Janssen MK, Ivanov A, Monsorno K, Labouèbe G, Leggio L, Pereira M, Beule D, Mansuy-Aubert V, Williams TL, **Iraci N**, Sierra A, Marro SG, Goate AM, Eggen BJL, Kerr WG, Paolicelli RC.
Microglial lipid phosphatase SHIP1 limits complement-mediated synaptic pruning in the healthy developing hippocampus.
Immunity. 2025 Jan 14;58(1):197-217.e13. (PMID: 39657671)
 3. De Gaetano F, Leggio L, Celesti C, Genovese F, Falcone M, Giofrè SV, **Iraci N**, Iraci N (UniMe), Ventura CA.
Study of Host-Guest Interaction and In Vitro Neuroprotective Potential of Cinnamic Acid/Randomly Methylated β -Cyclodextrin Inclusion Complex.
Int. J. Mol. Sci. 2024, 25(23), 12778. (PMID: 39684490)
 4. Martorana E, Raciti G, Giuffrida R, Bruno E, Ficarra V, Ludovico GM, Suardi NR, **Iraci N**, Leggio L, Benedetta Bussolati B, Grange C, Lorico A, Leonardi R, Forte S.
A Novel Liquid Biopsy Method Based on Specific Combinations of Vesicular Markers Allows Us to Discriminate Prostate Cancer from Hyperplasia.
Cells. 2024 Jul 31;13(15):1286. (PMID: 39120316)
 5. Salomone F, Pipitone RM, Longo M, Malvestiti F, Amorini AM, Distefano A, Casirati E, Ciociola E, **Iraci N**, Leggio L, ..., Valenti L, Petta S, Li Volti G, Grimaudo S.
SIRT5 rs12216101 T>G variant is associated with liver damage and mitochondrial dysfunction in patients with non-alcoholic fatty liver disease.
J Hepatol. 2024 Jan;80(1):10-19. (PMID: 37890719)
 6. Leggio L, Paternò G, Vivarelli S, Bonasera A, Pignataro B, **Iraci N***, Arrabito G*.
Label-free approaches for extracellular vesicle detection.
iScience. 2023 Sep 30;26(11):108105. (PMID: 37867957)
* Co-corresponding authors.
 7. Maugeri S, Sibbitts J, Privitera A, Cardaci V, Di Pietro L, Leggio L, **Iraci N**, Lunte SM, Caruso G.
The Anti-Cancer Activity of the Naturally Occurring Dipeptide Carnosine: Potential for Breast Cancer.
Cells. 2023 Nov 8;12(22):2592. (PMID: 37998326)
 8. F De Gaetano, A Scala, C Celesti, K Lambertsen Larsen, F Genovese, C Bongiorno, L Leggio, **N Iraci**, N Iraci (UniMe), A Mazzaglia, CA Ventura.
Amphiphilic Cyclodextrin Nanoparticles as Delivery System for Idebenone: A Preformulation Study.
Molecules. 2023 Mar 28;28(7):3023. (PMID: 37049785)

9. M Afsari, F Fesahat, AR Talebi, A Agarwal, R Henkel, F Zare, M Gül, **N Iraci**, R Cannarella, M Makki, M Anvari, AA Sarcheshmeh, AH Talebi.
ANXA2, SPI7, SERPINA5, PRDX2 genes, and sperm DNA fragmentation differentially represented in male partners of infertile couples with normal and abnormal sperm parameters.
Andrologia. 2022 Nov;54(10):e14556. (PMID: 36177795)
10. Leggio L, L'Episcopo F, Magri A, Ulloa-Navas MJ, Paternò G, Vivarelli S, Bastos CAP, Tirolò C, Testa N, Caniglia S, Risiglione P, Pappalardo F, Faria N, Peruzzotti-Jametti L, Pluchino S, Garcia-Verdugo JM, Messina A, Marchetti B*, **Iraci N***.
Small Extracellular Vesicles Secreted by Region-specific Astrocytes Rescue Cell Death and Preserve Mitochondrial Function in Parkinson's Disease.
Adv Healthc Mater. 2022 Oct;11(20):e2201203. (PMID: 35856921)
* Co-corresponding authors.
11. R Cannarella, A Crafa, LM Mongioì, L Leggio, **N Iraci**, S La Vignera, RA Condorelli, AE Calogero.
DNA Methylation in Offspring Conceived after Assisted Reproductive Techniques: A Systematic Review and Meta-Analysis.
J Clin Med. 2022 Aug 28;11(17):5056. (PMID: 36078985)
12. Leggio L, Paternò G, Vivarelli S, Falzone GG, Giachino C, Marchetti B*, **Iraci N***.
Extracellular Vesicles as Novel Diagnostic and Prognostic Biomarkers for Parkinson's Disease.
Aging Dis. 2021 Sep 1;12(6):1494-1515. (PMID: 34527424)
* Co-corresponding authors.
13. Peruzzotti-Jametti L, Bernstock JD, Willis CM, Manferrari G, Rogall R, Fernandez-Vizarra E, Williamson JC, Braga A, van den Bosch A, Leonardi T, Krzak G, Kittel Á, Benincá C, Vicario N, Tan S, Bastos C, Bicci I, **Iraci N**, Smith JA, .., Matheson NJ, Viscomi C, Pluchino S.
Neural stem cells traffic functional mitochondria via extracellular vesicles.
PLoS Biol. 2021 Apr 7;19(4):e3001166. (PMID: 33826607)
14. Risiglione P, Leggio L, Cubisino SAM, Reina S, Paternò G, Marchetti B, Magri A, **Iraci N***, Messina A*.
High-Resolution Respirometry Reveals MPP⁺ Mitochondrial Toxicity Mechanism in a Cellular Model of Parkinson's Disease.
Int J Mol Sci. 2020 Oct 22;21(21):7809. (PMID: 33105548)
* Co-last authors.
15. Leggio L, Paternò G, Vivarelli S, L'Episcopo F, Tirolò C, Raciti G, Pappalardo F, Giachino C, Caniglia S, Serapide MF, Marchetti B*, **Iraci N***.
Extracellular Vesicles as Nanotherapeutics for Parkinson's Disease.
Biomolecules. 2020 Sep 16;10(9):1327. (PMID: 32948090)
* Co-corresponding authors.
16. Leggio L, Arrabito G, Ferrara V, Vivarelli S, Paternò G, Marchetti B, Pignataro B*, **Iraci N***.
Mastering the Tools: Natural versus Artificial Vesicles in Nanomedicine.
Adv Healthc Mater. 2020 Sep;9(18):e2000731. (PMID: 32864899)
* Co-corresponding authors.
17. Marchetti B*, Leggio L, L'Episcopo F, Vivarelli S, Tirolò C, Paterno G, Giachino C, Caniglia S, Serapide MF, **Iraci N***.
Glia-Derived Extracellular Vesicles in Parkinson's Disease.
J Clin Med. 2020 Jun; 9(6): 1941. (PMID: 32575923)
* Equal contribution and co-corresponding authors.

18. Peruzzotti-Jametti L, Bernstock JD, Vicario N, Costa ASH, Kwok CK, Leonardi T, Booty LM, Bicci I, Balzarotti B, Volpe G, Mallucci G, Manferrari G, Donegà M, **Iraci N**, ..., Pluchino S.
Macrophage-Derived Extracellular Succinate Licenses Neural Stem Cells to Suppress Chronic Neuroinflammation.
Cell Stem Cell. 2018 Mar 1;22(3):355-368.e13. (PMID: 29478844)
19. L'Episcopo F, Caniglia S, Tirolo C, Serapide MF, Testa N, Leggio L, Vivarelli S, **Iraci N**, Pluchino S, Marchetti B.
Microglia Polarization, Gene-Environment Interactions and Wnt/ β -catenin Signalling: Emerging Roles of Glia-Neuron and Glia-Stem/Neuroprogenitor Crosstalk for Dopaminergic Neurorestoration in Aged Parkinsonian Brain.
Front. Aging Neurosci. 2018 Feb 12;10:12. (PMID: 29483868)
20. Leggio L, Vivarelli S, L'Episcopo F, Tirolo C, Caniglia S, Testa N, Marchetti B*, **Iraci N***.
microRNAs in Parkinson's Disease: From Pathogenesis to Novel Diagnostic and Therapeutic Approaches.
Int J Mol Sci. 2017 Dec 13;18(12):2698. (PMID: 29236052)
* Co-corresponding authors.
21. **Iraci N***, Gaude E*, Leonardi T, Costa ASH, Cossetti C, Peruzzotti-Jametti L, Bernstock JD, Saini HK, Gelati M, Vescovi AL, Bastos C, Faria N, Occhipinti LG, Enright AJ, Frezza C, Pluchino S.
Extracellular vesicles are independent metabolic units with asparaginase activity.
Nat Chem Biol. 2017 Sep;13(9):951-955. (PMID: 28671681)
* Equal contribution.
22. Pathan M, Keerthikumar S, Chisanga D, Alessandro R, Ang CS, Askenase P, Batagov AO, Benito-Martin A, Camussi G, Clayton A, Collino F, Di Vizio D, Falcon-Perez JM, Fonseca P, Fonseca P, Fontana S, Gho YS, Hendrix A, Hoen EN, **Iraci N**, ..., Maji S, Monteleone F, Øverbye A, Panaretakis T, Patel T, Peinado H, Pluchino S, Principe S, Ronquist G, Royo F, Sahoo S, Spinelli C, Stensballe A, Théry C, van Herwijnen MJC, Wauben M, Welton JL, Zhao K, Mathivanan S.
A novel community driven software for functional enrichment analysis of extracellular vesicles data.
J Extracell Vesicles. 2017 May 26;6(1):1321455. (PMID: 28717418)
23. **Iraci N***, Leonardi T*, Gessler F, Vega B and Pluchino S.
Focus on extracellular vesicles: Physiological role and signalling properties of extracellular membrane vesicles.
Int J Mol Sci. 2016 Feb 6;17(2). (PMID: 26861302)
* Equal contribution.
24. Fuster-Matanzo A, Gessler F, Leonardi T, **Iraci N** and Pluchino S.
Acellular approaches for regenerative medicine: on the verge of clinical trials with extracellular membrane vesicles?
Stem Cell Res Ther. 2015 Dec 2;6:227. (PMID: 26631254)
25. Tannahill GM*, **Iraci N***, Gaude E, Frezza C and Pluchino S.
Metabolic reprogramming of mononuclear phagocytes in progressive multiple sclerosis.
Front Immunol. 2015 Mar 11;6:106. (PMID: 25814990)
* Equal contribution.
26. Smith JA, Leonardi T, Huang B, **Iraci N**, Vega B, Pluchino S.
Extracellular vesicles and their synthetic analogues in aging and age-associated brain diseases.
Biogerontology. 2015 Apr;16(2):147-85. (PMID: 24973266)

27. C Cossetti*, **N Iraci***, TR Mercer, T Leonardi, E Alpi, D Drago, C Alfaro-Cervello, ME HK Saini, MP Davis, J Schaeffer, B Vega, M Stefanini, CJ Zhao, W Muller, JM Garcia-Verdugo, S Mathivanan, A Bachi, AJ Enright, JS Mattick, S Pluchino
Extracellular vesicles from neural stem cells transfer IFN- γ via Ifngr1 to activate Stat1 signalling in target cells.
Mol Cell. 2014 Oct 23;56(2):193-204. (PMID: 25242146)
* Equal contribution.
28. Drago D, Cossetti C, **Iraci N**, Gaude E, Musco G, Bachi A, Pluchino S.
The stem cell secretome and its role in brain repair.
Biochimie. 2013 Dec;95(12):2271-85. (PMID: 23827856)
29. Iacobucci I*, **Iraci N***, Messina M, Lonetti A, Chiaretti S, Valli E, Ferrari A, Papayannidis C, Paoloni F, Vitale A, Storlazzi CT, Ottaviani E, Guadagnuolo V, Durante S, Vignetti M, Soverini S, Pane F, Foà R, Baccarani M, Müschen M, Perini G, Martinelli
IKAROS deletions dictate a unique gene expression signature in patients with adult B-cell acute lymphoblastic leukemia.
PLoS One. 2012;7(7):e40934. (PMID: 22848414)
* Equal contribution.
30. Cossetti C, Smith JA, **Iraci N**, Leonardi T, Alfaro-Cervello C, Pluchino S.
Extracellular membrane vesicles and immune regulation in the brain.
Front Physiol. 2012;3:117. (PMID: 22557978)
31. Henderson MJ, Haber M, Porro A, Munoz MA, **Iraci N**, Xue C, Murray J, Flemming CL, Smith J, Fletcher JI, Gherardi S, Kwek CK, Russell AJ, Valli E, London WB, Buxton AB, Ashton LJ, Sartorelli AC, Cohn SL, Schwab M, Marshall GM, Perini G, Norris MD.
ABCC multidrug transporters in childhood neuroblastoma: clinical and biological effects independent of cytotoxic drug efflux.
J Natl Cancer Inst. 2011 Aug 17;103(16):1236-51. (PMID: 21799180)
32. Marshall GM, Liu PY, Gherardi S, Scarlett CJ, Bedalov A, Xu N, **Iraci N**, Valli E, Ling D, Thomas W, van Bekkum M, ..., Haber M, Norris MD, Biankin AV, Perini G, Liu T.
SIRT1 promotes N-Myc oncogenesis through a positive feedback loop involving the effects of MKP3 and ERK on N-Myc protein stability.
PLoS Genet. 2011 Jun;7(6):e1002135. (PMID: 21698133)
33. Porro A*, **Iraci N***, Soverini S, Diolaiti D, Gherardi S, Terragna C, Durante S, Valli E, Kalebic T, Bernardoni R, Perrod C, Haber M, Norris MD, Baccarani M, Martinelli G, Perini G.
c-MYC oncoprotein dictates transcriptional profiles of ATP-binding cassette transporter genes in chronic myelogenous leukemia CD34+ hematopoietic progenitor cells.
Mol Cancer Res. 2011 Aug;9(8):1054-66. (PMID: 21693596)
* Equal contribution.
34. **Iraci N***, Diolaiti D*, Papa A, Porro A, Valli E, Gherardi S, Herold S, Eilers M, Bernardoni R, Della Valle G, Perini G.
A SPI1/MIZ1/MYCN repression complex recruits HDAC1 at the TRKA and p75NTR promoters and affects neuroblastoma malignancy by inhibiting the cell response to NGF.
Cancer Res. 2011 Jan 15;71(2):404-12. (PMID: 21123453)
* Equal contribution.
35. Porro A, Crochemore C, Cambuli F, **Iraci N**, Contestabile A and Perini G.
Nitric oxide control of MYCN expression and multi drug resistance genes in tumors of neural origin.
Curr Pharm Des. 2010;16(4):431-9. (PMID: 20236072)

36. Marshall GM, Gherardi S, Xu N, Neiron Z, Trahair T, Scarlett CJ, Chang DK, Liu PY, Jankowski K, **Iraci N**, Haber M, Norris MD, Keating J, Sekyere E, Jonquieres G, Stossi F, Katzenellenbogen BS, Biankin AV, Perini G, Liu T.
Transcriptional upregulation of histone deacetylase 2 promotes Myc-induced oncogenic effects.
Oncogene. 2010 Nov 4;29(44):5957-68. (PMID: 20697349)
37. Chen L, **Iraci N**, Gherardi S, Gamgle LD, Wood KM, Perini G, Lunec J, Tweddle DA.
p53 is a Direct Transcriptional Target of MYCN in Neuroblastoma.
Cancer Res. 2010 Feb 15;70(4):1377-88. (PMID: 20145147)
38. Porro A, Haber M, Diolaiti D, **Iraci N**, Henderson M, Gherardi S, Valli E, Munoz MA, Xue C, Flemming C, Schwab M, Wong JH, Marshall GM, Della Valle G, Norris MD, Perini G.
Direct and coordinate regulation of ATP-binding cassette transporter genes by Myc factors generates specific transcription signatures that significantly affect the chemoresistance phenotype of cancer cells.
J Biol Chem. 2010 Jun 18;285(25):19532-43. (PMID: 20233711)
39. Liu T, Tee A, Porro A, Smith SA, Dwarte T, Liu PY, **Iraci N**, Sekyere E, Haber M, Norris MD, Diolaiti D, Della Valle G, Perini G and Marshall GM.
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Proc Natl Acad Sci USA. 2007 Nov 20; 104(47):18682-87. (PMID: 18003922)

Book chapters:

1. **Iraci N***, Tyzack GE, Cossetti C, Alfaro-Cervello C and Pluchino S*.
Viral Manipulation of neural stem/precursor cells.
Viral Vectors Approaches in Neurobiology and Brain Diseases. Neuromethods, Volume 82, 2014, pp 269-288. Humana Press publishers. ISBN: 978-1-62703-609-2.
* Co-corresponding authors.
2. Smith JA, Alfaro-Cervello C, Cossetti C, **Iraci N**, Stefanini M, and Pluchino S (2013).
Extracellular Membrane Vesicles (EMVs) and EMV-Based Therapeutics for Brain Diseases.
RNA Nanotechnology and Therapeutics. July 9, 2013, pp 409-428. P Guo and F. Haque (Eds); CRC Press, Taylor & Francis Group. ISBN: 9781466505667.

MEETING ABSTRACTS (SELECTED)

- Abstract selected for **oral presentation** at the EMBO Workshop “Astrocytes: From Molecules to Systems”, 14-18 Apr 2025, Venice, Italy. *Brain repair and Parkinson's disease: the secret(ed) spread of astrocyte-derived extracellular vesicles.*
- **Invited speaker** at the 7th Brainstorming Research Assembly of Young Neuroscientists (BraYn), 9-11 Oct 2024, Verona, Italy. *From cell-to-cell communication to nanomedicine: the secret(ed) spread of extracellular vesicles.*
- **Invited speaker** at the 74th Italian Society of Physiology Congress, 11-13 Sep 2024, Rome, Italy. *Cell-to-cell communication and neuroprotection: insights from astrocyte-derived extracellular vesicles in Parkinson's disease.*
- **Invited speaker** at the Dept. of Cellular, Computational and Integrative Biology (CIBIO), Univ. of Trento, Italy, 19 Jun 2024. *From cell-to-cell communication to nanomedicine: the secret(ed) spread of extracellular vesicles.*
- Symposium **organizer** and **speaker** (upon selection) at the 20th National Congress of the Italian Society for Neuroscience (SINS), 14-17 Sep 2023, Turin, Italy. *Neuroprotective role(s) of astrocyte-derived extracellular vesicles.*

- Abstract selected for **oral presentation** at the 2nd EVIta Workshop EV Connect: fostering collaboration, 29-30 Sep 2022, Turin, Italy. *Brain region specificity and Parkinson's disease: preservation of mitochondrial function mediated by astrocyte-derived extracellular vesicles.*
- **Invited speaker** at the 50^o Italian Society of Microbiology Congress, 18-21 Sep 2022, Napoli, Italy. *From interkingdom signaling to nanomedicine: the secret(ed) spread of extracellular vesicles.*
- **Invited speaker** at the Glial cells-neuron crosstalk in CNS health and disease Workshop, 1st-3rd Oct 2020, live streaming. *Exosomes as natural messengers of bioactive molecules in the glial-neuronal signaling in Parkinson's disease.*
- Abstract selected for **oral presentation** at the Joint Meeting Membrane Biophysics of Exo-Endocytosis: from Model Systems to Cells, 3-6 Apr 2019, Mandelieu-la-Napoule, France. *Extracellular vesicles as a novel strategy of cell-to-cell communication.*
- **Invited speaker** at the CNR Institute of Neuroscience, 8 Feb 2019, Milan, Italy. *Extracellular Vesicles and Cell-to-Cell Communication in the Brain.*
- **Invited speaker** at the First BraYn meeting, 29-30 Jun 2018, Genova, Italy. *Extracellular vesicles as a novel strategy of cell-to-cell communication.*
- **Invited speaker** at the First International GIBB Meeting, 14-16 Jun 2017, Catania, Italy. *Extracellular vesicles are independent metabolic units with asparaginase activity*
- **Invited speaker** at the Joint Meeting of the SIF Workgroups "Neurodegenerative Diseases" and "Inflammation", 9-10 Jun 2016, Catania, Italy. *Controversies in Neurodegeneration.*
- Abstract selected for **oral presentation** and **travel grant** at the UK/Russia joint workshop Extracellular vesicles, 1-5 Mar 2015, Moscow (Russian Federation). *Extracellular vesicles secreted by neural stem cells as a novel mechanism of cell-to-cell communication.*
- **Invited speaker** at the Cambridge Centre for Brain Repair Away Day, 6 Jan 2015, Girton College, Cambridge, UK.
- **Invited speaker** and **Biochemical Society Travel Grant** at the 4th Optic Nerve Meeting, 3-5 Dec 2014, Obergurgl, Austria. *Extracellular vesicles secreted by neural stem cells as a novel mechanism of cell-to-cell communication.*
- **Poster** and **travel grant** at the FEBS EMBO Conference, 30 Aug-4 Sep 2014, Paris, France. *Mechanisms of mobile ncRNAs in neural stem/precursor cells.*
- Abstract selected for **oral presentation** and **travel grant** at the American Society of Hematology, 51th Annual Meeting and Exposition, 5-8 Dec 2009, New Orleans, LA, USA. *Suppression of Bcr-Abl Expression in CML by A Panel of miRNAs.*
- **Invited speaker** at the AICC Annual Meeting, 26-28 Nov 2008, Bologna, Italy. *Direct and coordinate regulation of ABC transporter genes by the transcription factor Myc.*

TEACHING AND OTHER INSTITUTIONAL ACTIVITIES

- **Teaching at the Univ. of Catania**
 - ✓ *Academic year (AA) 2024/2025 – to date: "Biologia Molecolare" (6 CFU, University Educational Credit), MSc in Chemical Sciences.*
 - ✓ *AA 2023/2024 – to date: "Molecular Biology" (1 CFU, in English), MSc in Medicine and Surgery.*
 - ✓ *AA 2022/2023 – to date: "Diagnostica molecolare preimpianto e prenatale" (3 CFU), MSc in Medical Biotechnology.*
 - ✓ *AA 2022/2023 – to date: "Vescicole Cellulari e Nanobioteconologie Molecolari" (6 CFU), MSc in Medical Biotechnology.*
 - ✓ *AA 2021/2022 – to date: "Biologia Molecolare" (6 CFU), BSc in Biotechnology.*
 - ✓ *AA 2020/2021 – to date: "Biologia Molecolare" (2 CFU), Specialization School in Microbiology and Virology.*
 - ✓ *AA 2019/2020 – 2022/2023: "Biologia Molecolare" (6 CFU), MSc in Chemistry and Pharmaceutical Technology.*
 - ✓ *AA 2019/2020 – 2020/2021: "Biologia Molecolare Avanzata" (6 CFU), BSc in Biotechnology.*
 - ✓ *AA 2017/2018 – 2021/2022: "Signaling vescicolare intra e inter-cellulare" (6 CFU); MSc in Medical Biotechnology.*

- **Institutional activities at the Univ. of Catania**

- ✓ *April 2025 – to date*: co-organizer Centro di ricerca multidisciplinare basata su utilizzo di fasci IONICI (IONIC).
- ✓ *November 2023 – to date*: Departmental Biological Safety Officer.
- ✓ *July 2022 – to date*: supervisor of platform technology at the Bio-nanotech research and innovation tower (BRIT).
- ✓ *AA 2017/2018 – to date*: committee member of the PhD Program in Biotechnology (code: DOT1708221), coordinator: Professor Vito De Pinto.
- ✓ Organization of scientific seminars for the PhD Program in Biotechnology.

- **International Mobility**

- ✓ Outgoing: Visiting Scientist at the Dept. of Clinical Neurosciences, Univ. of Cambridge, for different periods between June 2016 and June 2019.
- ✓ Incoming: I hosted Prof Kari Espolin Fladmark, Dept. of Biological Sciences, Univ. of Bergen (Norway), as Visiting Professor from September 2024 to December 2024.

- **Institutional activities in other Universities**

- ✓ *July 2015 – December 2015*: Divisional Biological Safety Officer, Dept. of Clinical Neurosciences, Univ. of Cambridge.
- ✓ *AA 2007/2008 – 2009/2010*: Teaching Assistant and Laboratory Instructor, Laboratory of Genetics, MSc in Molecular Biology. Dept. of Biology, Univ. of Bologna.
- ✓ *AA 2005/2006 – 2006/2007*: Teaching Assistant and Laboratory Instructor, Laboratory of Genomics, BSc in Biological Science. Dept. of Biology, Univ. of Bologna.

- **Mentor/Supervisor Activities at the Univ. of Catania**

- ✓ Loredana Leggio (2017 – to date): Postdoc and Research Fellow (RTD-A).
- ✓ Fabrizio Pappalardo (2019 – to date): MSc in Medical Biotechnology, PhD student in Telecommunication Engineering and Postdoc (co-supervisor).
- ✓ Fabrizio Cavallaro (2021 – to date): MSc in Sanitary and Cellular-Molecular Biology and PhD student in Biotechnology (co-supervisor).
- ✓ Marco Catania (2022 – to date): MSc in Medical Biotechnology, and PhD student in Innovation in the diagnosis, prevention and treatment of infections at epidemic-pandemic risk (University of Siena, co-supervisor).
- ✓ Marco Falcone (2022 – to date): BSc in Biotechnology and MSc in Medical Biotechnology.
- ✓ Maria Cullurà (2023 – to date): BSc in Biotechnology and MSc in Medical Biotechnology.
- ✓ Valentina Sgarlata (2023 – to date): BSc in Biotechnology and MSc in Medical Biotechnology.
- ✓ Greta Paternò (2018 – 2024): MSc in Sanitary and Cellular-Molecular Biology, and PhD student in Biotechnology.
- ✓ Mauro Di Stefano (2022 – 2023): MSc in Cellular-Molecular Biology.
- ✓ Patrizia Caruso (2021– 2022): MSc in Sanitary and Cellular-Molecular Biology.
- ✓ Giovanna Falzone (2020): MSc in Sanitary and Cellular-Molecular Biology.
- ✓ Gabriele Raciti (2019 – 2020): graduate student and Visitor.
- ✓ Other BSc students for their Theses.
- ✓ Support provided for other students, the ERASMUS Traineeships Program, etc.

- **Mentor/Supervisor Activities in other Universities**

- ✓ Florian Gessler (2014-2016): PhD in Clinical Neurosciences, Univ. of Cambridge.
- ✓ Julia Schaeffer (2012-2013): MPhil, Univ. of Cambridge.
- ✓ Matilde Stefanini (2011-2012): MSc in Cellular and Molecular Medical Biotechnology, Univ. Vita & Salute, Milan (research at the Dept. of Clinical Neurosciences, Univ. of Cambridge).
- ✓ Roberta Napolitano (2010): BSc in Bio-sanitary Biotechnology, Univ. of Bologna.
- ✓ Francesco Sottile (2009): BSc in Molecular and Industrial Biotechnology, Univ. of Bologna.
- ✓ Emanuele Valli (2007-2010): MSc in Molecular and Industrial Biotechnology and PhD in Cellular Biology and Physiology, Univ. of Bologna.

EDITORIAL INITIATIVES AND MEMBERSHIPS

- 2024 – to date: Editorial Board Member of **Extracellular Vesicles and Circulating Nucleic Acids**.
- 2023 – to date: co-founder of the **Italian Glia Network**.
- 2023 – to date: Associate Editor of **Frontiers in Bioengineering and Biotechnology – Nanobiotechnology**.
- 2022 – to date: Member of the **Italian Society for Neuroscience (SINS)**.
- 2020 – to date: Editorial Board Member of **Frontiers in Cellular Neuroscience**.
- 2019 – to date: Member of the **Italian Society of Extracellular Vesicles (EVIta)**.
- 2018 – to date: Member of the **Società Italiana di Biofisica e Biologia Molecolare (SIBBM)**.
- 2018 – to date: Member of the **Società Italiana di Biochimica e Biologia Molecolare (SIB)**.
- 2014 – to date: Editorial Board Member of **Frontiers in Molecular Neuroscience**.
- 2021 – 2024: Editorial Board Member of **Biomedicines**.
- 2016 – 2017: Research Topic Editor at **Frontiers in Molecular Biosciences: Cell-to-cell communication by extracellular vesicles: from biogenesis and functions to clinical use as novel biomarkers and therapeutic tools**.
- 2014 – 2015: Member of the **International Society of Neuroimmunology (ISNI)**.
- 2014 – 2015: Member of the **British Neuroscience Association (BNA, UK)**.
- 2011 – 2014: Member of the **Biochemical Society (BS, UK)**.

REVIEWER ACTIVITIES

- 2017 – to date: Member of REPRISE (Register of Expert Peer-Reviewers for Italian Scientific Evaluation, MIUR).
- FISM Grant, Italy.
- Member of the BraYn Starting Grant Committee.
- Brain Canada-WBHI Expansion Grants.
- Neurological Foundation, New Zealand.
- Biotechnology and Biological Sciences Research Council (BBSRC), UK.
- Medical Research Council (MRC), UK.
- Muscular Dystrophy, UK.
- The Research Foundation - Flanders (FWO), Belgium.
- Judge at the School of Clinical Medicine Research Day, Univ. of Cambridge, UK.
- Reviewer for several international journals: Translational Neurodegeneration, Small Methods, Advanced Science, Advanced Functional Materials, Advanced Healthcare Materials, Journal of Nanobiotechnology, Journal of Alzheimer's Disease, Molecular Therapy, Biomaterials, Frontiers in Molecular Neuroscience, Molecular neurobiology, Frontiers in Pharmacology (and other Frontiers journals), Stem Cell Research & Therapy, International Journal of Molecular Sciences (and other MDPI journals), European Biophysics Journal, Clinical and Experimental Immunology.

Catania, 09/05/2025

