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SCIENZE BIOMEDICHE
E BIOTECNOLOGICHE

BIOMETEC

a research for life

2023



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E BIOTECNOLOGICHE



Biometec: a research for life





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Preface

The Department of Biomedical and Biotechnological Sciences (Biometec) comprises 7 sections: Medical Biochemistry; Pharmacology; Physiology; Microbiology; General, Clinical and Oncological Pathology; Anatomy, Histology and Movement Sciences; Biology and Genetics.

The management and central administration are located at the Biological Tower. The same building hosts all the sections except for Anatomy, Histology and Movement Sciences which is partly located in an adjacent building.

The 92 members of the academic staff are engaged in teaching programs in basic and master courses within the department: Biotechnology, Motor Sciences, Physiotherapy, Orthoptics, Occupational Therapy and Nutrition. They also teach in the courses of Medicine, Dentistry, Pharmacy, Biology, Nursing and several others, all connected to health sciences. An agreement with Fujan University in Fuzhou, China, allowed the activation of a dedicated class for Chinese students in the course of Motor Sciences. Post-graduate teaching activity includes three PhD courses (Neuroscience, Basic and Applied Biomedical Sciences, Biotechnology), and Residencies for medical and non-medical students (Clinical Biochemistry and Pathology, Medical Pharmacology and Toxicology, Medical Genetics, Physical and Rehabilitative Medicine, Microbiology and Virology, Nutrition Sciences) and a wide selection of first and second level professional Masters.

All members of the Department are actively involved in research activities covering a wide range of topics, mainly in the preclinical area, always aimed at the improvement of human health.

Biometec works in an internationally-oriented perspective, establishing collaborations, promoting faculty and student mobility and participating in exchange programs worldwide.

The Department is also involved in third mission activities, making a big effort to transfer scientific knowledge outside the academic environment, through public engagement. In addition, technology transfer represents for Biometec a main objective to contribute to innovation and public benefit.



Maria Angela Sortino, Chairman of the Biometec

Human Resources



Faculty (92 professors):

- 22 full professors
- 40 associate professors
- 30 assistant professors

Staff (20 units):

- 1 Coordinator
- 2 Administrative Office
- 2 Financial Office
- 4 Procurement Office
- 4 Teaching Office
- 5 Laboratory Coordination Office
- 1 Information Technology Centre
- 1 National Health Service Agreement





BIOMETEC Organization

Maria Angela Sortino (Chairman)

Marco Ragusa (Vice Chairman)

Department Board

Maria Angela Sortino (Chairman)

Marco Ragusa (Vice Chairman)

Antonio Arcidiacono

Viviana Cafiso

Fabio Galvano

Giuseppe Musumeci

Daniele Tibullo

Nunzio Vicario

Quality Committee

Davide Barbagallo

Maria Angela Chisari

Lucia Ciranna

Pio Maria Furneri

GianMarco Leggio

Pia Aiello

Antonio Cantarella

Chairman Delegates

Davide Barbagallo

Quality

Pio Maria Furneri

Teaching activity

Gian Marco Leggio

Research activity

Lucia Ciranna

Third mission

Maria Angela Chisari

Erasmus Projects and Internationalization

Maria Stella Valle

Student inclusivity

Katia Mangano

Communication and web site coordination

Maria Santagati

Orientation, representative and promotional duties

Claudio Bucolo

Liaison with the School of Advanced Studies and Intellectual Property Protection



Section of Anatomy, Histology and Movement Sciences

Faculty members



Velia D'AGATA
Full Professor
Section Coordinator



Carla LORETO
Full Professor



Giuseppe MUSUMECI
Full Professor



Paola CASTROGIOVANNI
Associate Professor



Salvatore GIUNTA
Associate Professor



Rosa IMBESI
Associate Professor



Alessandra AMATO
Assistant Professor



Michelino DI ROSA
Assistant Professor



Claudia LOMBARDO
Assistant Professor



Grazia MAUGERI
Assistant Professor



Luca PETRIGNA
Assistant Professor

Section of Anatomy, Histology and Movement Sciences

Laboratory of Functional Organ Anatomy

- Asbestos exposure correlated organ-diseases;
- Temporomandibular joint (TMJ) disorders;
- Biomolecular mechanisms alterations in Peyronie's disease (PD);
- Surgical anatomy of male urethra

Laboratory of Clinical Chinesiology

- Postural analysis through digital and markerless instruments to detect paramorphism and dysmorphism in healthy and pathological people;
- Performance analysis through infrared thermocamera, dynamometer, gas analyzer, and video-analysis for athletes, para-athletes, and people with pathology of different ages;
- Training and conditioning research adopting an iso-inertial machine, the whole body vibration, and other techniques for the prevention, reathletization and intervention programs

Laboratory of Neurobiology

- Molecular mechanisms involved in Neurodegenerative disease such as Parkinson Disease and Amyotrophic Lateral Sclerosis;
- Pathophysiological role of VIP family members in the brain;
- Molecular mechanisms involved in retinal degeneration during diabetic retinopathy development

Laboratory of Tissue Engineering

- Osteoarthritis and musculoskeletal conditions and the relative effects of diet, ageing and physical activity;
- Tissue engineering for tissue regeneration using mesenchymal stem cells and mechanobiology

Laboratory of Molecular Histology and Cellular Morphology

- Immune cellular differentiation;
- Molecular pathways regulation during monocyte differentiation



Section of Anatomy, Histology and Movement Sciences



Section of Anatomy, Histology and Movement Sciences



INTERNATIONAL COLLABORATIONS



Section of Anatomy, Histology and Movement Sciences



GRANTS

- PRIN 2017. New therapeutic tools to prevent diabetic retinopathy. Grant number: PRIN 2017TSHBXZ_003
- 2018 - 2028. Developing Chinese-Foreign Collaborative Undergraduate Education Program in Physical Education. Ministero dell'Istruzione della Repubblica Cinese.
- 2022. Lo sport: una meravigliosa palestra di valori. Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR). Grant number: ctrho3000c.



Section of Anatomy, Histology and Movement Sciences

Research paper selection of Biometec (2020-2023)

Modulatory activity of ADNP on the hypoxia induced angiogenic process in glioblastoma

D'Amico AG, **Maugeri G**, Magni B, **Giunta S**, Saccone S, Federico C, Pricoco E, Broggi G, Caltabiano R, **Musumeci G**, Reglodi D, **D'Agata V**. - Int J Oncol. 2023 Jan;62(1):14. doi: 10.3892/ijo.2022.5462. Epub 2022 Dec 9. PMID: 36484392.

Activity-Dependent Neuroprotective Protein (ADNP)-Derived Peptide (NAP) Counteracts UV-B Radiation-Induced ROS Formation in Corneal Epithelium

Maugeri G, D'Amico AG, **Giunta S**, Giallongo C, Tibullo D, Bucolo C, Saccone S, Federico C, Scollo D, Longo A, Avitabile T, **Musumeci G**, **D'Agata V**. - Antioxidants (Basel). 2022 Jan 7;11(1):128. doi: 10.3390/antiox11010128. PMID: 35052632; PMCID: PMC8773440.

Attenuation of High Glucose-Induced Damage in RPE Cells through p38 MAPK Signaling Pathway Inhibition

Maugeri G, Bucolo C, Drago F, Rossi S, **Di Rosa M**, **Imbesi R**, **D'Agata V**, **Giunta S**. - Front Pharmacol. 2021 May 7;12:684680. doi: 10.3389/fphar.2021.684680. PMID: 34025440; PMCID: PMC8138305.

Differential Vulnerability of Oculomotor Versus Hypoglossal Nucleus During ALS: Involvement of PACAP

Maugeri G, D'Amico AG, Morello G, Reglodi D, Cavallaro S, **D'Agata V**. - Front Neurosci. 2020 Aug 11;14:805. doi: 10.3389/fnins.2020.00805. PMID: 32848572; PMCID: PMC7432287.

Thermography and rasterstereography as a combined infrared method to assess the posture of healthy individuals

Roggio F, **Petrigna L**, Trovato B, Zanghì M, Sortino M, Vitale E, ... & **Musumeci G**. (2023). Scientific Reports, 13(1), 4263.

Infrared thermography for the evaluation of adolescent and juvenile idiopathic scoliosis: A systematic review

Roggio F, **Petrigna L**, Filetti V, Vitale E, Rapisarda V, & **Musumeci G**. - (2023). Journal of Thermal Biology, 103524.

Molecular Assessment of Healthy Pathological Articular Cartilages in Physically Active People: A Scoping Review

Petrigna L, Trovato B, **Roggio F**, Castorina A, & **Musumeci G**. - (2023). International Journal of Molecular Sciences, 24(4), 3662.

Running Footwear and Impact Peak Differences in Recreational Runners

Roggio F, Trovato B, Zanghì M, **Petrigna L**, Testa G, Pavone V, & **Musumeci G**. - (2022). Biology, 11(6), 818.

MacroH2A1 Immunoexpression in Breast Cancer

Broggi G, Filetti V, Ieni A, Rapisarda V, Ledda C, Vitale E, Varricchio S, Russo D, **Lombardo C**, Tuccari G, Caltabiano R, **Loreto C**. - Front Oncol. 2020 Aug 21;10:1519. doi: 10.3389/fonc.2020.01519. eCollection 2020. PMID: 32974186 Free PMC article.

ATG7 immunohistochemical expression in malignant pleural mesothelioma. A preliminary report

Rapisarda V, Broggi G, Caltabiano R, **Lombardo C**, Castorina S, Trovato A, Ledda C, Filetti V, **Loreto C**. - Histol Histopathol. 2021 Dec;36(12):1301-1308. doi: 10.14670/HH-18-396. Epub 2021 Nov 11. PMID: 34761371

Home Working and Physical Activity during SARS-CoV-2 Pandemic: A Longitudinal Cohort Study

Rapisarda V, **Loreto C**, De Angelis L, Simoncelli G, **Lombardo C**, Resina R, Mucci N, Matarazzo A, Vimercati L, Ledda C. - Int J Environ Res Public Health. 2021 Dec 10;18(24):13021. doi: 10.3390/ijerph182413021.

Dysregulation of microRNAs and tRNA-derived ncRNAs in mesothelial and mesothelioma cell lines after asbestiform fiber exposure

Filetti V, La Ferlita A, Di Maria A, Cardile V, Graziano ACE, Rapisarda V, Ledda C, Pulvirenti A, **Loreto C**. - Sci Rep. 2022 Jun 2;12(1):9181. doi: 10.1038/s41598-022-13044-0.

Resistin-like beta reduction is associated to low survival rate and is downregulated by adjuvant therapy in colorectal cancer patients

Di Rosa M, Di Cataldo A, Broggi G, Caltabiano R, Tibullo D, **Castrogiovanni P**, **Imbesi R**, Lanteri R, Salomone F, Raciti G, Li Volti G. - Sci Rep. 2023 Jan 27;13(1):1490. doi: 10.1038/s41598-023-28450-1. PMID: 36707698; PMCID: PMC9883247.

Chitinase domain containing 1 increase is associated with low survival rate and Mo macrophages infiltrates in colorectal cancer patients

Castrogiovanni P, Barbagallo I, **Imbesi R**, **Musumeci G**, Sanfilippo C, Broggi G, Caltabiano R, Tibullo D, Giallongo C, Forte S, Li Volti G, **Di Rosa M**. - Pathol Res Pract. 2022 Sep;237:154038. doi: 10.1016/j.prp.2022.154038. Epub 2022 Jul 22. PMID: 35932496.

GNG13 Is a Potential Marker of the State of Health of Alzheimer's Disease Patients' Cerebellum

Sanfilippo C, **Musumeci G**, Kazakova M, Mazzone V, **Castrogiovanni P**, **Imbesi R**, **Di Rosa M**. J Mol Neurosci. 2021 May;71(5):1046-1060. doi: 10.1007/s12031-020-01726-1. Epub 2020 Oct 15. PMID: 33057964.

Network perturbation analysis in human bronchial epithelial cells following SARS-CoV2 infection

Nunnari G, Sanfilippo C, **Castrogiovanni P**, **Imbesi R**, Li Volti G, Barbagallo I, **Musumeci G**, **Di Rosa M**. - Exp Cell Res. 2020 Oct 15;395(2):112204. doi: 10.1016/j.yexcr.2020.112204. Epub 2020 Jul 28. PMID: 32735892; PMCID: PMC7386311.



Section of Biology and Genetics

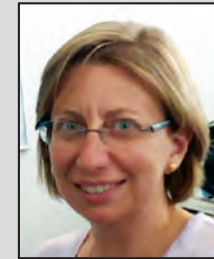
Faculty members



Vito DE PINTO
Full Professor



Cinzia DI PIETRO
Associate Professor



Francesca GUARINO
Associate Professor



Nunzio IRACI
Associate Professor



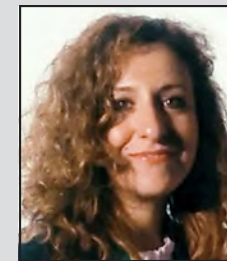
Giuseppe NICOSIA
Associate Professor



Marco RAGUSA
Associate Professor



Davide BARBAGALLO
Assistant Professor



Rosalia BATTAGLIA
Assistant Professor



SIMONA REINA
Assistant Professor

Section of Biology and Genetics

Biology, Genomics and Bioinformatics Unit (BGB)

Cinzia Di Pietro

- Biological and molecular bases of female reproductive aging.
- Biological and molecular function of non coding RNA in human ovarian follicles and in preimplantation embryo.
- MicroRNAs as early biomarkers of testicular tumors.
- Development of nanosensors to improve biopsy liquid specificity.

Marco Ragusa

- Biological and molecular functions of non-coding RNAs (e.g., miRNAs, lncRNAs, circRNAs) in cellular and extracellular environments in in vitro and ex-vivo models of cancers and neurodegenerative diseases.
- Application of in vitro and in silico approaches to study RNA-RNA network

Davide Barbagallo

- Biological and molecular functions of non-coding RNAs (ncRNAs) in Glioblastoma (GBM) through in vitro and ex-vivo models.
- ncRNA-mediated regulatory molecular networks: experimental validation and in silico prediction
- Identification of early cancer diagnostic and prognostic biomarkers through minimally invasive approaches

Rosalia Battaglia

- Biological and molecular functions of non-coding RNAs in oocyte maturation and embryo implantation, signaling mechanisms in the extracellular environment as cargo of extracellular vesicles, and role in the development of reproductive disorders, such as female reproductive aging.

Molecular Biology, Biotechnology and Synthetic Biology Unit (MB1)

Vito De Pinto

- VDAC1 as pharmacological target in cancer and neurodegeneration
- Functional roles of VDAC1 in physiological conditions
- Structure and electrophysiological features of human VDAC1

Francesca Guarino

- Molecular analysis of gene and regulative regions of VDAC isoforms
- Gene expression and regulation of VDAC isoforms in normal and stress condition associated to degenerative disorders
- Characterization of cellular and molecular mechanisms by microfluidics devices utilization

Simona Reina

- Molecular analysis of post-translation modifications of membrane proteins
- Redox modifications of VDAC isoforms: physiological meaning
- Bioenergetics and redox impact of natural compounds on living cells

Molecular Biology and Cellular Biology Unit (MB2)

Nunzio Iraci

- Parkinson's disease and molecular mechanisms of CNS protection and repair
- Cell-to-cell communication via extracellular vesicles, including exosomes
- Horizontal RNA transfer (coding and non-coding)

Section of Biology and Genetics

Bioengineering and Synthetic Biology Unit (BSB)

Giuseppe Nicosia

- Bioengineering: re-engineering cells and biological circuits as programmable devices
- Biomedical engineering: artificial intelligence and machine learning for medicine
- Synthetic Biology: design of integrated biological systems capable of autonomously performing useful tasks
- Systems Biology: programming of selected cells and organelles



we.MitoBiotech srl is an innovative Spin-Off of the University of Catania led by researchers of the Section of Biology and Genetics.

we.MitoBiotech srl is dedicated to the research and development of new molecules able to counteract mitochondrial dysfunction in neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease and Amyotrophic Lateral Sclerosis (ALS).

Established in 2020, we.MitoBiotech provides companies operating in the pharmaceutical, nutraceutical and cosmetic industries with its expertise in high-resolution investigative techniques to test the effect of specific molecules on mitochondrial function under physiological and/or pathological conditions.

The business idea behind the start-up was selected and won the Start Cup 2019 of the University of Catania. The Start-Up develops the international patent obtained by the team on 'Pharmacologically active peptide compound, process for the preparation and use therefore': 2021 US Patent No. 10,800,81.

Section of Biology and Genetics



AWARDED GRANTS / ACHIEVEMENTS OF JUNIOR RESEARCHERS

Biology, Genomics and Bioinformatics Unit (BGB)

PON-Hyppocrates 2012

I.R.C.C.S. Associazione Oasi Maria SS. ONLUS – Troina

Grant for Fertility Innovation (GFI) 2018 by Merck KGaA, Darmstadt, Germany

H2020 project – Marie Skłodowska Curie Research and Innovation Staff Exchange (RISE) through diaRNAgnosis consortium

PNRR progetto di ricerca dal titolo Health Extended Alliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision, tematica n. 6

Molecular Biology, Biotechnology and Synthetic Biology Unit (MB1)

National Recovery and Resilience Plan (NRRP - Next Generation EU 2022) National Center for RNA drugs – Spoke 2, Cancer

National Recovery and Resilience Plan (NRRP - Next Generation EU 2022) “Microfluidic-based devices for the comprehensive management and analysis of liquid biopsies”- SAMOTHRACE

PRIN 2010-2013, PRIN 2015, CHANCE, FIR ARISLA 2015

Post-Doctoral Fellowship Fondazione Umberto Veronesi

Molecular Biology and Cellular Biology Unit (MB2)

“Brains2South” grant (Fondazione con il Sud - Bando Capitale Umano ad Alta Qualificazione 2015)

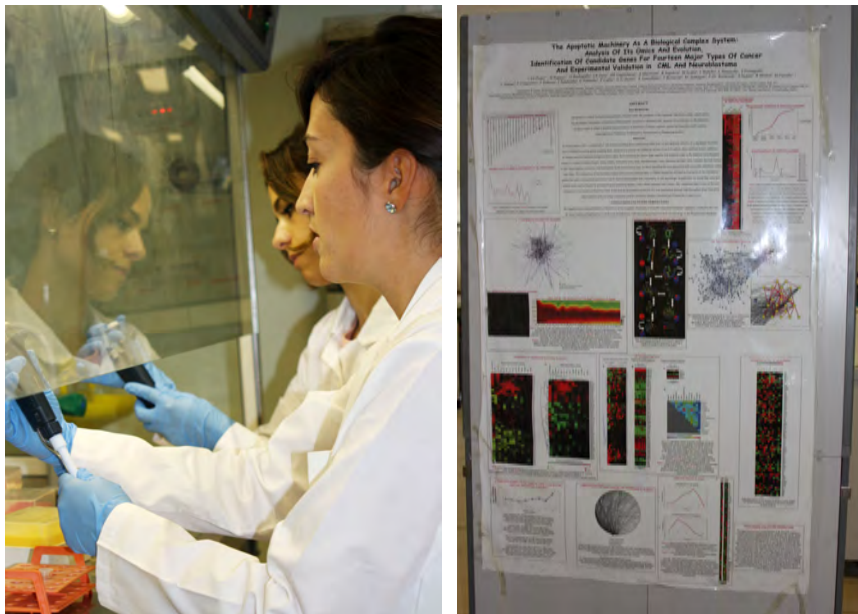
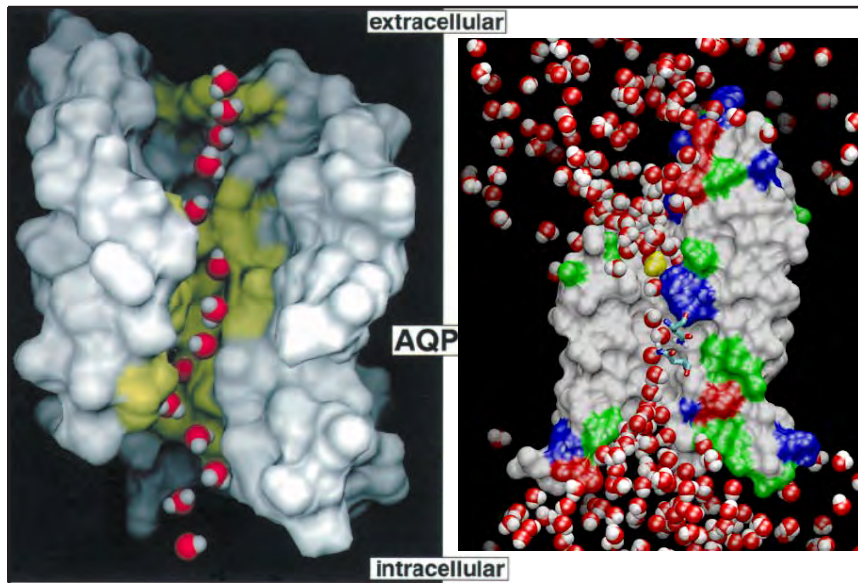
“National Recovery and Resilience Plan” (NRRP - Next Generation EU 2022)



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UNIVERSITÀ DI CATANIA



Section of Biology and Genetics



INTERNATIONAL COLLABORATIONS

Biology, Genomics and Bioinformatics Unit (BGB)

- Antonio Belli (University of Birmingham, Great Britain)
- Valentina Di Pietro (University of Birmingham, Great Britain)
- Thomas Birkballe Hansen (University of Aarhus, Denmark)
- Jorge Hoheisel (German Cancer Research Center, Germany)
- Hadi Valadi (University of Gothenburg, Sweden)

Molecular Biology, Biotechnology and Synthetic Biology Unit (MB1)

- Ildiko Szabo (University of Padova, Italy)
- Mathias Winterhalter (Biotechnologie, Jacobs Universität Bremen, Germany)
- R. Mahalakshmi (Indian Institute of Science Education and Research, Bhopal, India)
- Varda Shoshan-Barmatz (Ben Gurion Univ. & Negev Institute of Technology, Beer Sheva, Israel)

Molecular Biology and Cellular Biology Unit (MB2)

- Stefano Pluchino (University of Cambridge, UK)
- Nuno Faria (University of Cambridge, UK)
- Anton Enright (University of Cambridge, UK)
- Jose Manuel Garcia Verdugo (University of Valencia, Spain)

Bioengineering and Synthetic Biology Unit (BSB)

- Steve Oliver (University of Cambridge, UK)
- Rodrigo Ledesma Amaro (Imperial College London, UK)
- Renato Umeton (Dana-Farber Cancer Institute, USA)
- Luca Zammataro (Yale University, USA)

Section of Biology and Genetics

Research paper selection of Biometec (2020-2023)

Identification of extracellular vesicles and characterization of miRNA expression profiles in human blastocoel fluid.

Battaglia R, Palini S, Vento ME, La Ferlita A, Lo Faro MJ, Caroppo E, Borzì P, Falzone L, **Barbagallo D**, **Ragusa M**, Scalia M, D'Amato G, Scollo P, Musumeci P, Purrello M, Gravotta E, **Di Pietro C**. Sci Rep. 2019 Jan 14;9(1):84. doi: 10.1038/s41598-018-36452-7.

Ovarian aging increases small extracellular vesicle CD81+ release in human follicular fluid and influences miRNA profiles.

Battaglia R, Musumeci P, **Ragusa M**, **Barbagallo D**, Scalia M, Zimbone M, Lo Faro JM, Borzì P, Scollo P, Purrello M, Vento EM, **Di Pietro C**. Aging (Albany NY). 2020 Jun 17;12(12):12324-12341. doi: 10.18632/aging.103441

Deletion of Voltage-Dependent Anion Channel 1 knocks mitochondria down triggering metabolic rewiring in yeast.

Magrì A, Di Rosa MC, Orlandi I, **Guarino F**, **Reina S**, Guarnaccia M, Morello G, Spampinato A, Cavallaro S, Messina A, Vai M, **De Pinto V**. - Cell Mol Life Sci. 2020 Aug;77(16):3195-3213. doi:10.1007/s00018-019-03342-8.

LncRNA LINCO0518 Acts as an Oncogene in Uveal Melanoma by Regulating an RNA-Based Network.

Barbagallo C, Caltabiano R, Broggi G, Russo A, Puzzo L, Avitabile T, Longo A, Reibaldi M, **Barbagallo D**, **Di Pietro C**, Purrello M, **Ragusa M**. Cancers (Basel). 2020 Dec 21;12(12):3867. doi: 10.3390/cancers12123867.

LINCO0483 Has a Potential Tumor-Suppressor Role in Colorectal Cancer Through Multiple Molecular Axes.

Brex D, Barbagallo C, Mirabella F, Caponnetto A, **Battaglia R**, **Barbagallo D**, Caltabiano R, Broggi G, Memeo L, **Di Pietro C**, Purrello M, **Ragusa M**. - Front Oncol. 2021 Jan 20;10:614455. doi: 10.3389/fonc.2020.614455.

Renaissance of VDAC: New Insights on a Protein Family at the Interface between Mitochondria and Cytosol.

De Pinto V. - Biomolecules. 2021 Jan 15;11(1):107. doi: 10.3390/biom11010107.

Neural stem cells traffic functional mitochondria via extracellular vesicles.

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, Bucci I, **Iraci N**, Smith JA, Peacock B, Muller KH, Lehner PJ, Buzas EI, Faria N, Zeviani M, Frezza C, Brisson A, Matheson NJ, Viscomi C, Pluchino S. - PLoS Biol. 2021 Apr 7;19(4):e3001166. (PMID: 33826607)

A Novel Silicon Platform for Selective Isolation, Quantification, and Molecular Analysis of Small Extracellular Vesicles.

Leonardi AA, **Battaglia R**, Morganti D, Lo Faro MJ, Fazio B, De Pascali C, Francioso L, Palazzo G, Mallardi A, Purrello M, Priolo F, Musumeci P, **Di Pietro C**, Irrera A. - Int J Nanomedicine. 2021 Sep 28;16:5153-5165. doi: 10.2147/IJN.S310896.

Cell-free electrophysiology of human VDACS incorporated into nanodiscs: An improved method.

Conti Nibali S., Di Rosa MC, Rauh O. , Thiel G., **Reina S. , De Pinto V.**, - Biophysical Reports, 2021, 1, Issue 1, 100002, DOI: 10.1016/j.bpr.2021.100002

Competing endogenous RNA network mediated by circ_3205 in SARS-CoV-2 infected cells.

Barbagallo D, Palermo CI, Barbagallo C, **Battaglia R**, Caponnetto A, Spina V, **Ragusa M**, **Di Pietro C**, Scalia G, Purrello M. - Cell Mol Life Sci. 2022 Jan 17;79(2):75. doi: 10.1007/s00018-021-04119-8.

Resveratrol Treatment Induces Mito-miRNome Modification in Follicular Fluid from Aged Women with a Poor Prognosis for In Vitro Fertilization Cycles.

Battaglia R, Caponnetto A, Caringella AM, Cortone A, Ferrara C, Smirni S, Iannitti R, Purrello M, D'Amato G, Fioretti B, **Di Pietro C**. - Antioxidants (Basel). 2022 May 21;11(5):1019. doi: 10.3390/antiox11051019.

Voltage Dependent Anion Channel 3 (VDAC3) protects mitochondria from oxidative stress.

Reina S, Nibali SC, Tomasello MF, Magrì A, Messina A, **De Pinto V**. - Redox Biol. 2022, 51:102264. doi: 10.1016/j.redox.2022.102264.

Pareto optimal metabolic engineering for the growth-coupled overproduction of sustainable chemicals. Biotechnology

Amaradio MN, Ojha V, Jansen G, Gulisano M, Costanza J, **Nicosia G.**, - Biotechnology and Bioengineering 2022 Jul. 119(7):1890-1902. doi: 10.1002/bit.28103

Small Extracellular Vesicles Secreted by Region-specific Astrocytes Rescue Cell Death and Preserve Mitochondrial Function in Parkinson's Disease.

Leggio L, L'Episcopo F, Magrì A, Ulloa-Navas MJ, Paternò G, Vivarelli S, Bastos CAP, Tirola C, Testa N, Caniglia S, Risiglion P, Pappalardo F, Faria N, Peruzzotti-Jametti L, Pluchino S, Garcia-Verdugo JM, Messina A, Marchetti B, **Iraci N**. - Adv Health Mater. 2022 Oct;11(20):e2201203. (PMID: 35856921)

circSMARCA5 Is an Upstream Regulator of the Expression of miR-126-3p, miR-515-5p, and Their mRNA Targets, Insulin-like Growth Factor Binding Protein 2 (IGFBP2) and NRAS Proto-Oncogene, GTPase (NRAS) in Glioblastoma.

Merulla AE, Stella M, Barbagallo C, **Battaglia R**, Caponnetto A, Broggi G, Altieri R, Certo F, Caltabiano R, **Ragusa M**, Barbagallo GMV, **Di Pietro C**, Purrello M, **Barbagallo D**. - Int J Mol Sci. 2022 Nov 8;23(22):13676. doi: 10.3390/ijms232213676.

Cell counting and velocity algorithms for hydrodynamic study of unsteady biological flows in micro-channels.

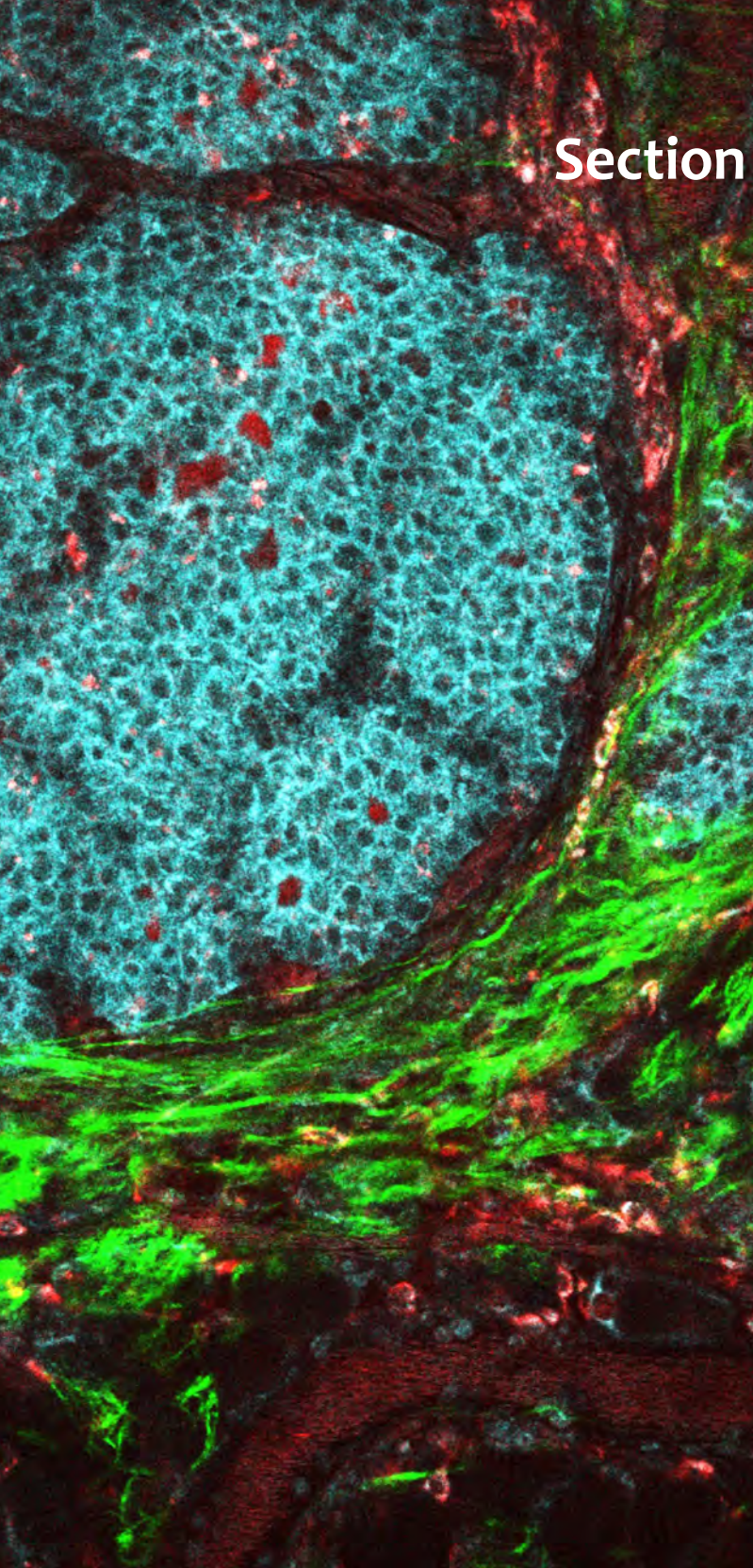
Torrisi F, Stella G, **Guarino F**, Bucolo M. - Biomicrofluidics. 2023 Jan 23;17(1):014105. doi: 10.1063/5.0138587.

ERK1/2-dependent TSPO overactivation associates with the loss of mitophagy and mitochondrial respiration in ALS.

Magrì A, Lipari CLR, Risiglion P, Zimbone S, **Guarino F**, Caccamo A, Messina A. - Cell Death Dis. 2023 Feb 15;14(2):122. doi: 10.1038/s41419-023-05643-0.

L-lactate production in engineered Saccharomyces cerevisiae using a multistage multiobjective automated design framework.

Amaradio MN, Jansen G, Costanza J, Patanè A, Branduardi P, Porro D, **Nicosia G.**, - Biotechnology and Bioengineering, 2023 Apr 5. doi: 10.1002/bit.28391



Section of General, Clinical and Oncological Pathology

Faculty members



Massimo LIBRA
Full Professor
Section Coordinator



Lucia MALAGUARNERA
Full Professor



Ferdinando NICOLETTI
Full Professor



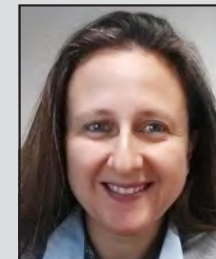
Paolo Fabrizio FAGONE
Associate Professor



Antonio ARCIDIACONO
Assistant Professor



Saverio CANDIDO
Assistant Professor



Katia MANGANO
Assistant Professor



Cristina RUSSO
Assistant Professor

Section of General, Clinical and Oncological Pathology

LABORATORY OF IMMUNOPATHOLOGY AND TRANSLATIONAL IMMUNOPHARMACOLOGY

Research team:

Ferdinando Nicoletti, Paolo Fagone, Katia Mangano

Temporary Staff:

1 PhD student

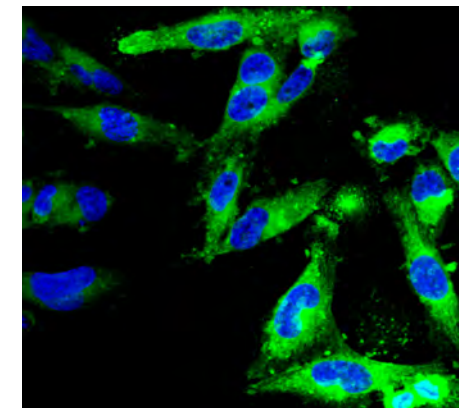
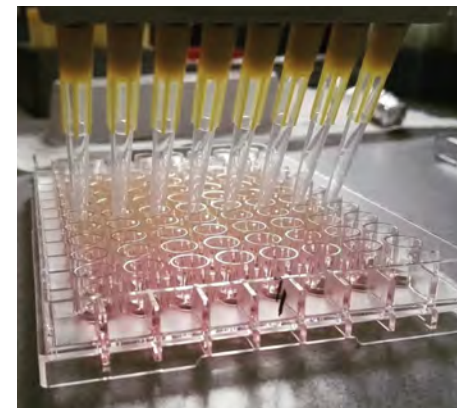
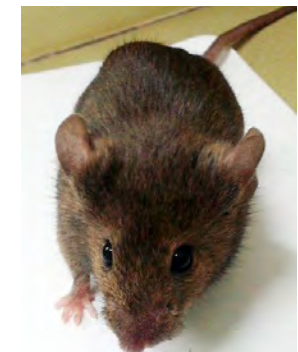
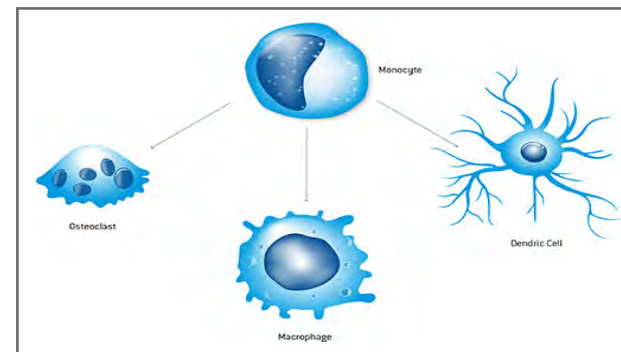
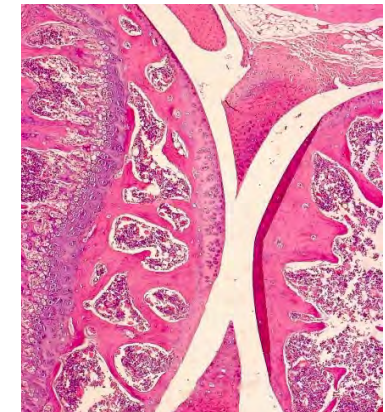
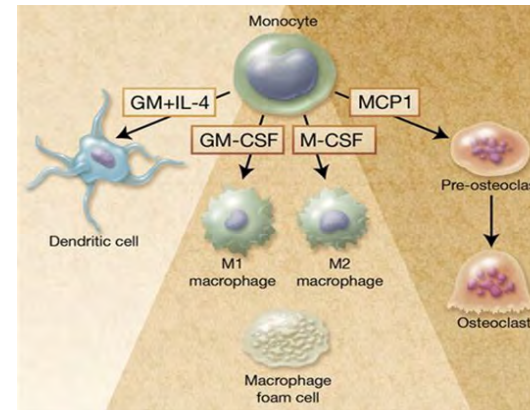
The Laboratory of Immunopathology and Translational Immunopharmacology conducts research in the areas of immunopharmacology, autoimmunity, immuno-oncology, and experimental oncology. Its research activities focus primarily on understanding the pathogenic mechanisms of autoimmune and neoplastic diseases, as well as evaluating the efficacy of new therapeutic approaches. To achieve these aims, the laboratory employs a wide range of techniques and methodologies, including in vitro and in vivo preclinical models and in silico whole-genome profiling analyses. In particular, the laboratory focuses on researching new therapeutic approaches for autoimmune diseases such as multiple sclerosis, systemic lupus erythematosus, and rheumatoid arthritis, as well as for neoplastic pathologies such as melanoma, lung cancer, pancreatic cancer, and prostate cancer.

LABORATORY OF MOLECULAR IMMUNOPATHOLOGY

Research team:

Lucia Malaguarnera, Cristina Russo

AIMS: To characterize the immunological variations and the molecular mechanisms associated with degenerative and metabolic disorders; to test the efficacy of molecules such as ghrelin, curcumin and vitamin D in differentiation and neurodegeneration.



Section of General, Clinical and Oncological Pathology

LABORATORY OF EXPERIMENTAL ONCOLOGY

Research Team:

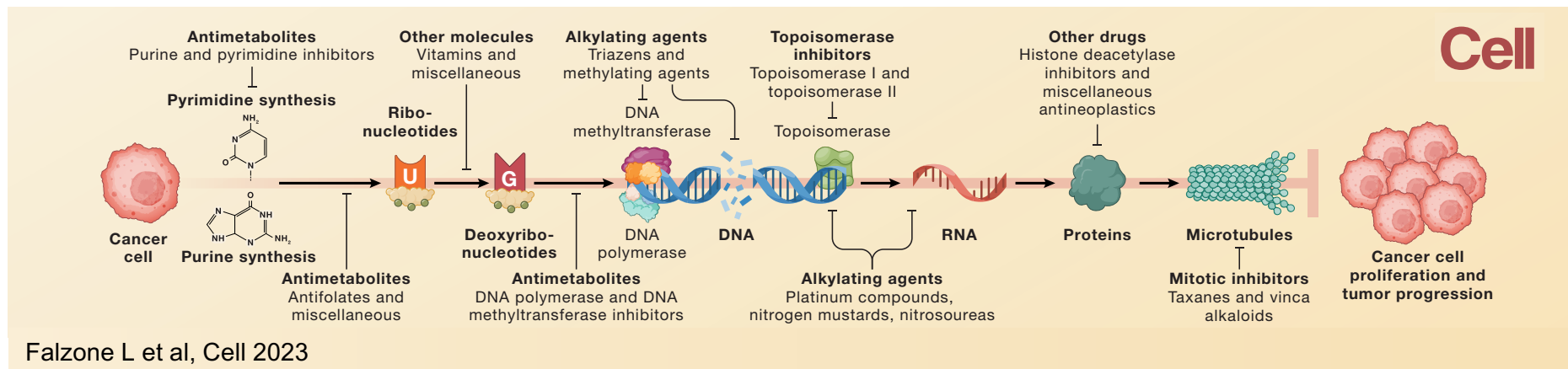
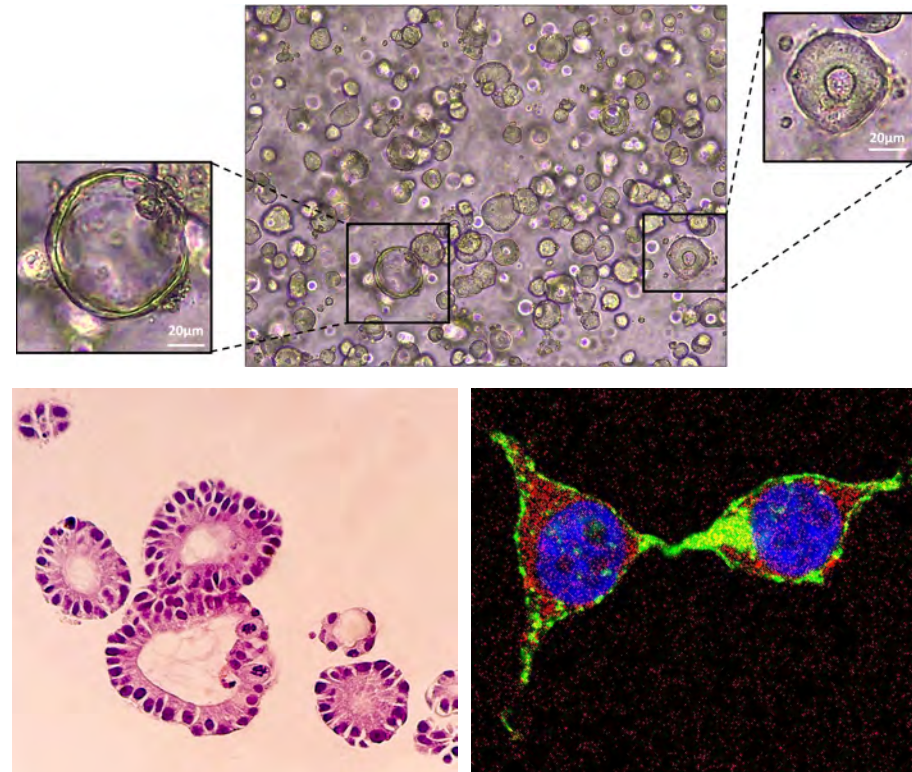
Massimo Libra, Saverio Candido

Temporary staff:

1 visiting scientist, 1 Post-doctoral fellow, 2 Ph.D. students

The aims of the experimental oncology laboratory are the definition of the molecular mechanisms involved in cancer development and progression and the identification of novel biomarkers for the diagnosis and prognosis of tumors. The laboratory includes three main units labeled: (1) Tumor Development and Computational Oncology; (2) Cancer Epigenetics and Biomarker Discovery and (3) Cancer Prevention (in collaboration with the Italian League against Cancer - LILT).

The main research programs are: Bioinformatic approaches; Biomarker Discovery; Cancer and Microbiome; Functional Genomics and Therapeutic Targets; Molecular Determinants of Cancer; Neuroinflammation and Cancer; Cancer prevention; Nutrition and cancer.



Section of General, Clinical and Oncological Pathology

FUNDING SUPPORTS

LABORATORY OF IMMUNOPATHOLOGY AND TRANSLATIONAL IMMUNOPHARMACOLOGY

Competitive Research Grant Support

- PNRR-MAD-2022-12376723: “The longevity-associated variant of BPIFB4: a novel tool against thrombocytosis and aspirin resistance in diabetes”.
- PO FESR SICILIA 2014/2020 - 08CT6201000232: SAFE-DEMON.
- Starting Grant PIACERI 2020/2022: “Valutazione del ruolo della tetraspanina 32 (TSPAN32) nella regolazione delle risposte immunitarie”.
- ERASMUS+ KA2 Capacity building in Higher Education: SAFETY and Quality of Patient Care (SAFEMED).

Private Research Grant Support

- OncoOne Research and Development GmbH Höhenstrasse 19/2, A-3400 Klosterneuburg, Austria:
 1. “Therapeutic effects of OncoOne anti-oxMIF antibodies in murine type II collagen-induced arthritis (CIA)”.
 2. “Therapeutic effects of OncoOne anti-oxMIF antibodies in association with sub-therapeutic doses of dexamethasone in murine type II collagen-induced arthritis (CIA)”.
 3. “Therapeutic effects of OncoOne anti-oxMIF antibodies administered alone and in association with sub-therapeutic doses of dexamethasone in colitis induced in SCID mice by the transfer of CD4+ CD25- T cells”.
 4. “Dose finding evaluation of OncoOne anti-oxMIF antibodies in murine type II collagen-induced arthritis (CIA)”.
- Aileens Pharma srl, Nova Milanese, Italia: Effects of LimpiadAD cream on murine oxazolone-induced dermatitis.
- Medivis srl, Italia: “Cytotoxicity, anti-inflammatory effects and permeability of Nepafenac 0.1%/Dexamethasone 0.1% eye drop formulation.

LABORATORY OF MOLECULAR IMMUNOPATHOLOGY

Competitive Research Grant Support

- PNRR: Health Extended Alliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision- Spoke 7, WP4, Task 4.4 (Prevention Strategies).
- PIACERI Intramural Grant: “Evaluation of the metabolic and biomechanical characteristics of the knee musculoskeletal system in patients with chronic obstructive pulmonary disease”.

LABORATORY OF EXPERIMENTAL ONCOLOGY

Competitive Research Grant Support

- Ricerca Sanitaria LILT 2023-25: “Alimentazione e attività fisica: un modello combinato per migliorare la qualità della vita nei pazienti con can- cro della mammella e del colon durante il follow-up”.
- PNRR MUR – M4C2 – CN00000041 “National Center for Gene Therapy and Drugs based on RNA Technology” – Spoke 2 (Cancer).
- PNRR: Health Extended Alliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision- Spoke 5, WP3 Re-educating the microbiome to ameliorate therapeutic responses, Task 3.1.
- Horizon 2020 Call: H2020-SC1-2016-2017: “In Silico Trial for Tuberculosis Vaccine Development (STriTuVaD)”.
- PON 2014-2020: “NAOCON, Nuovi antimicrobici ottenuti da composti di origine naturale”.
- Ricerca Sanitaria LILT 2018-22: “Valutazione genetico-molecolare nei familiari di pazienti affetti da carcinoma mammario e carcinoma ovarico BRCA1 e/o BRCA2 positivo quale potenziale strategia di screening”.

Private Research Grant Support

- 2017-2023: “Effetti del Lactobacillus Rhamnosus GG* (ATCC 53103) in ambito oncologico”.

Section of General, Clinical and Oncological Pathology

INTERNATIONAL COLLABORATIONS

LABORATORY OF IMMUNOPATHOLOGY AND TRANSLATIONAL IMMUNOPHARMACOLOGY

Dominick Auci: Therapyx, Inc., Louisville, Kentucky, USA

Sanja Mijatović: University of Belgrade, Serbia

Danijela Maksimović-Ivanić: University of Belgrade, Serbia

José F. Muñoz-Valle: Universidad de Guadalajara, Mexico

Lyubka Tancheva: Bulgarian Academy of Sciences, Bulgaria

Reni Kalfin: - South-West University "N. Rilski", Bulgaria

Tinatin Chikovani: Tbilisi State Medical University, Georgia

Roberto Di Marco: Università degli Studi del Molise, Italy

LABORATORY OF EXPERIMENTAL ONCOLOGY

Benjamin Bonavida: University of California Los Angeles, CA, USA

James A. McCubrey: East Carolina University, Greenville, NC, USA

Aristides Tsatsakis: University of Crete, Greece

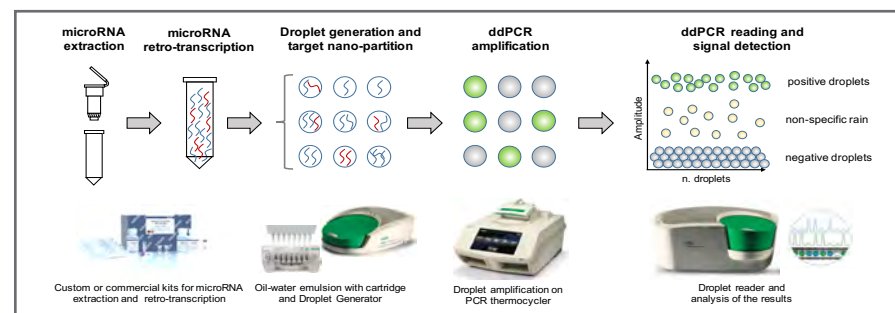
Livia S. Augustin: St. Michael's Hospital, Toronto, Canada

Roberta Maestro: National Cancer Institute, CRO Aviano, Italy

Jerry Polesel: National Cancer Institute, CRO Aviano, Italy

Concettina Fenga: Università degli Studi di Messina, Italy

Paolo A. Ascierto: National Cancer Institute G. Pascale, Naples, Italy



ddPCR workflow for the detection of miRNAs awarded by Bio-Rad Laboratories

ANNUAL AWARD

LABORATORY OF EXPERIMENTAL ONCOLOGY

- “Margaret Foti Award” for the best PhD thesis in the field of oncology awarded in collaboration with the American Association for Cancer Research, the Italian League Against Cancer and the PhD program in Basic and Applied Biomedical Sciences, University of Catania

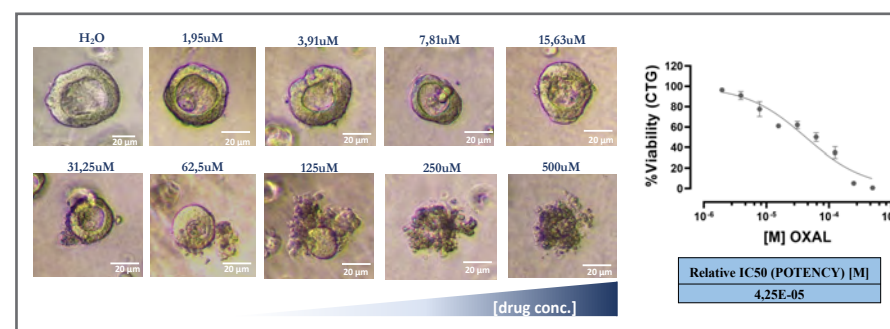
ACHIEVEMENTS OF JUNIOR RESEARCHERS

LABORATORY OF EXPERIMENTAL ONCOLOGY

- 2023: “Premio Cecilia Cioffrese - Malattie Oncologiche 2022” awarded by Fondazione Carlo Erba for innovative research studies in oncology

- 2023: “Premio Carlo Romano” awarded by the Italian League Against Cancer for the best Master thesis in oncology field

- 2021: “Positive Droplet Award” for the category “miRNA detection and quantification” awarded by Bio-Rad Laboratories for the innovative studies on liquid biopsy and microRNA identification in cancer



Drug screening experiments performed on patient-derived tumor organoids

Section of General, Clinical and Oncological Pathology

Research paper selection of Biometec (2020-2023)

Vitamin D and microbiota: Two sides of the same coin in the immunomodulatory aspects. *Int Immunopharmacol.*

Malaguarnera L. 2020 Feb;79:106112. doi: 10.1016/j.intimp.2019.106112.

Nitric Oxide in Hematological Cancers: Partner or Rival? Antioxid Redox Signal.

Vivarelli S, Falzone L, Basile MS, Candido S, Libra M. 2021 Feb 10;34(5):383-401. doi: 10.1089/ars.2019.7958. Epub 2020 Mar 17.

The Double-Faced Role of Nitric Oxide and Reactive Oxygen Species in Solid Tumors.

Mijatović S, Savić-Radojević A, Plješa-Ercegovac M, Simić T, Nicoletti F, Maksimović-Ivanić D. *Antioxidants (Basel).* 2020 Apr 30;9(5):374

Transcriptional landscape of SARS-CoV-2 infection dismantles pathogenic pathways activated by the virus, proposes unique sex-specific differences and predicts tailored therapeutic strategies.

Fagone P, Ciurleo R, Lombardo SD, Iacobello C, Palermo CI, Shoenfeld Y, Bendtzen K, Bramanti P, Nicoletti F. *Autoimmun Rev.* 2020 Jul;19(7):102571.

Identification of Modulated MicroRNAs Associated with Breast Cancer, Diet, and Physical Activity.

Falzone L, Grimaldi M, Celentano E, Augustin LSA, Libra M. - *Cancers (Basel).* 2020 Sep 8;12(9):2555. doi: 10.3390/cancers12092555.

Effects of Combined Administration of Imatinib and Sorafenib in a Murine Model of Liver Fibrosis.

Pesce A, Ciurleo R, Bramanti A, Armeli Iapichino EC, Petralia MC, Magro GG, Fagone P, Bramanti P, Nicoletti F, Mangano K. *Molecules.* 2020 Sep 20;25(18):4310

Droplet Digital PCR Analysis of Liquid Biopsy Samples Unveils the Diagnostic Role of hsa-miR-133a-3p and hsa-miR-375-3p in Oral Cancer.

Crimi S, Falzone L, Gattuso G, Grillo CM, Candido S, Bianchi A, Libra M. - *Biology (Basel).* 2020 Nov 6;9(11):379.

Atopic Dermatitis as a Multifactorial Skin Disorder. Can the Analysis of Pathophysiological Targets Represent the Winning Therapeutic Strategy?

Magnifico I, Petronio Petronio G, Venditti N, Cutuli MA, Pietrangelo L, Vergalito F, Mangano K, Zella D, Di Marco R. *Pharmaceutics (Basel).* 2020 Nov 22;13(11):411

Cognitive Decline in Rheumatoid Arthritis: Insight into the Molecular Pathogenetic Mechanisms.

Basile MS, Ciurleo R, Bramanti A, Petralia MC, Fagone P, Nicoletti F, Cavalli E. *Int J Mol Sci.* 2021 Jan 26;22(3):1185.

Therapeutic Potential of Alpha-Lipoic Acid in Viral Infections, including COVID-19.

Dragomanova S, Miteva S, Nicoletti F, Mangano K, Fagone P, Pricoco S, Staykov H, Tancheva L. *Antioxidants (Basel).* 2021 Aug 16;10(8):1294.

Protective role of vitamin D against oxidative stress in diabetic retinopathy.

Valle MS, Russo C, Malaguarnera L. *Diabetes Metab Res Rev.* 2021 Nov;37(8):e3447. doi: 10.1002/dmrr.3447. Epub 2021 Mar 24.

Effect of Unloaded and Curcumin-Loaded Solid Lipid Nanoparticles on Tissue Transglutaminase Isoforms Expression Levels in an Experimental Model of Alzheimer's Disease.

Campisi A, Sposito G, Pellitteri R, Santonocito D, Bisicchia J, Raciti G, Russo C, Nardiello P, Pignatello R, Casamenti F, Puglia C. *Antioxidants (Basel).* 2022 Sep 21;11(10):1863. doi: 10.3390/antiox11101863.

Bioinformatic analysis of the LCN2-SLC22A17-MMP9 network in cancer: The role of DNA methylation in the modulation of tumor microenvironment.

Candido S, Tomasello B, Lavoro A, Falzone L, Gattuso G, Russo A, Paratore S, McCubrey JA, Libra M. *Front Cell Dev Biol.* 2022 Sep 21; 10:945586.

Oral Delivery of Encapsulated All-Trans Retinoic Acid Ameliorates Disease in Rodent Models of Colitis.

Nicoletti F, Hammer L, Furtado S, Mangano K, Mathiowitz E, Green B, Auci D. *Inflamm Bowel Dis.* 2022 Mar 2;28(3):455-465.

The PI3KCA H1047R Mutation Confers Resistance to BRAF and MEK Inhibitors in A375 Melanoma Cells through the Cross-Activation of MAPK and PI3K-Akt Pathways.

Candido S, Salemi R, Piccinin S, Falzone L, Libra M. *Pharmaceutics.* 2022 Mar 8;14(3):590.

The PI3K/Akt/mTOR pathway: A potential pharmacological target in COVID-19.

Basile MS, Cavalli E, McCubrey J, Hernández-Bello J, Muñoz-Valle JF, Fagone P, Nicoletti F. *Drug Discov Today.* 2022 Mar;27(3):848-856.

Identification of the most common BRCA alterations through analysis of germline mutation databases: Is droplet digital PCR an additional strategy for the assessment of such alterations in breast and ovarian cancer families?

Lavoro A, Scalisi A, Candido S, Zanghì GN, Rizzo R, Gattuso G, Caruso G, Libra M, Falzone L. - *Int J Oncol.* 2022 May;60(5):58. doi: 10.3892/ijo.2022.5349.

The Interplay between Ghrelin and Microglia in Neuroinflammation: Implications for Obesity and Neurodegenerative Diseases.

Russo C, Valle MS, Russo A, Malaguarnera L. *Int J Mol Sci.* 2022 Nov 3;23(21):13432. doi: 10.3390/ijms232113432.

Lactobacillus rhamnosus GG cell-free supernatant as a novel anti-cancer adjuvant.

Salemi R, Vivarelli S, Ricci D, Scillato M, Santagati M, Gattuso G, Falzone L, Libra M. *J Transl Med.* 2023 Mar 14;21(1):195.

Signature in the Plasticity of Neurodegenerative Diseases.

Russo C, Valle MS, Casabona A, Malaguarnera L. *Chitinase Int J Mol Sci.* 2023 Mar 27;24(7):6301. doi: 10.3390/ijms24076301.

Snapshot: Cancer Chemotherapy.

Falzone L, Bordonaro R, Libra M. *Cell.* 2023 April 13; 186: P1816-1816.E1

Section of Medical Biochemistry

Faculty members

BIOCHEMISTRY



Ignazio BARBAGALLO
Associate Professor
Section Coordinator



Daniele F. CONDORELLI
Full Professor



Giuseppe LAZZARINO
Full Professor



Giovanni LI VOLTI
Full Professor



Angela M. AMORINI
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C. Daniela ANFUSO
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Daniele TIBULLO
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Lucia LONGHITANO
Assistant Professor



Nicola MUSSO
Assistant Professor

MEDICAL GENETICS



Marco FICHERA
Associate Professor



Corrado ROMANO
Associate Professor

HUMAN NUTRITION AND DIETETICS



Fabio GALVANO
Full Professor



Giuseppe GROSSO
Full Professor



Walter CURRENTI
Assistant Professor



Justyna GODOS
Assistant Professor

CLINICAL BIOCHEMISTRY AND CLINICAL MOLECULAR BIOLOGY



Vittorio CALABRESE
Full Professor



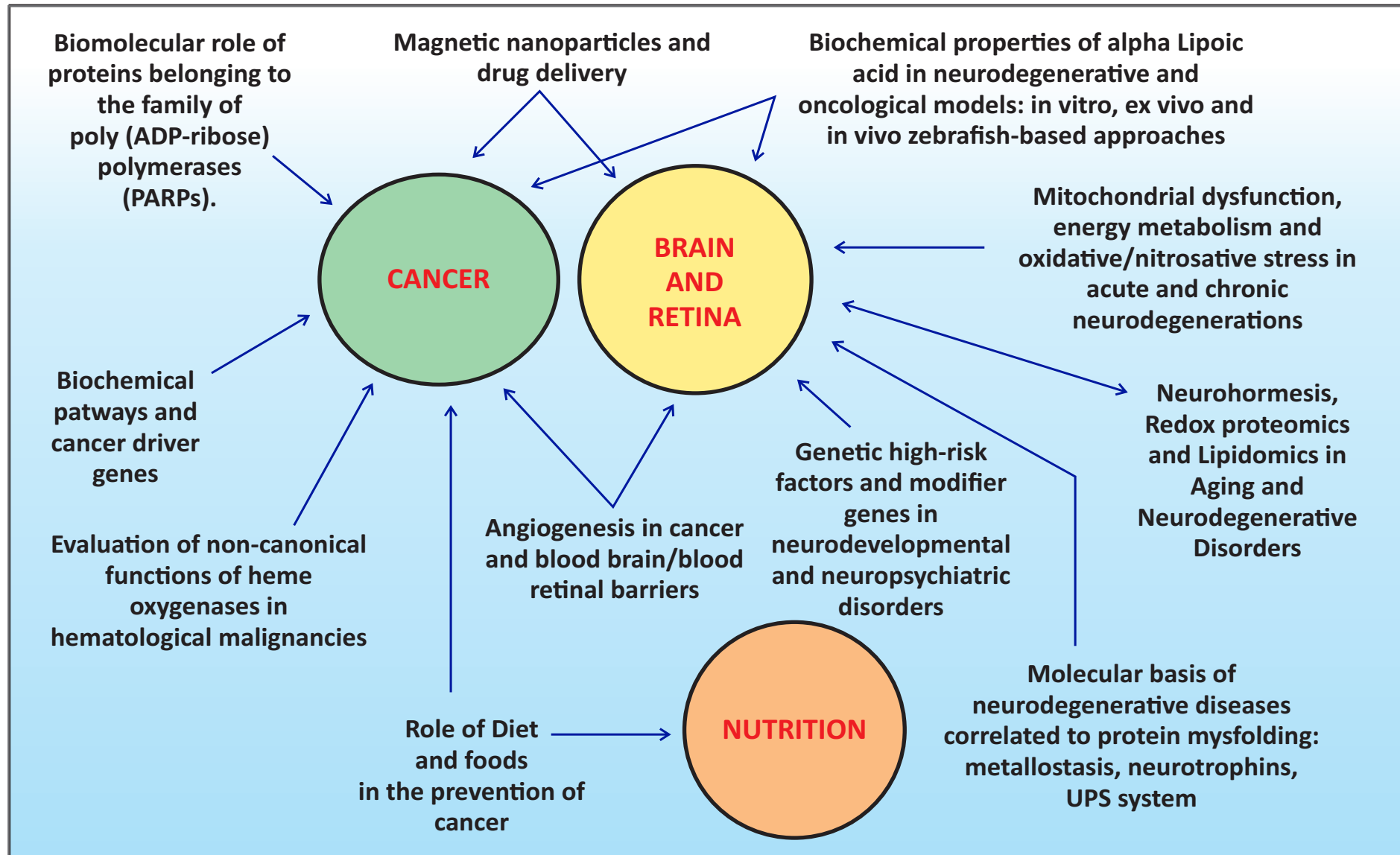
Vincenza BARRESI
Associate Professor



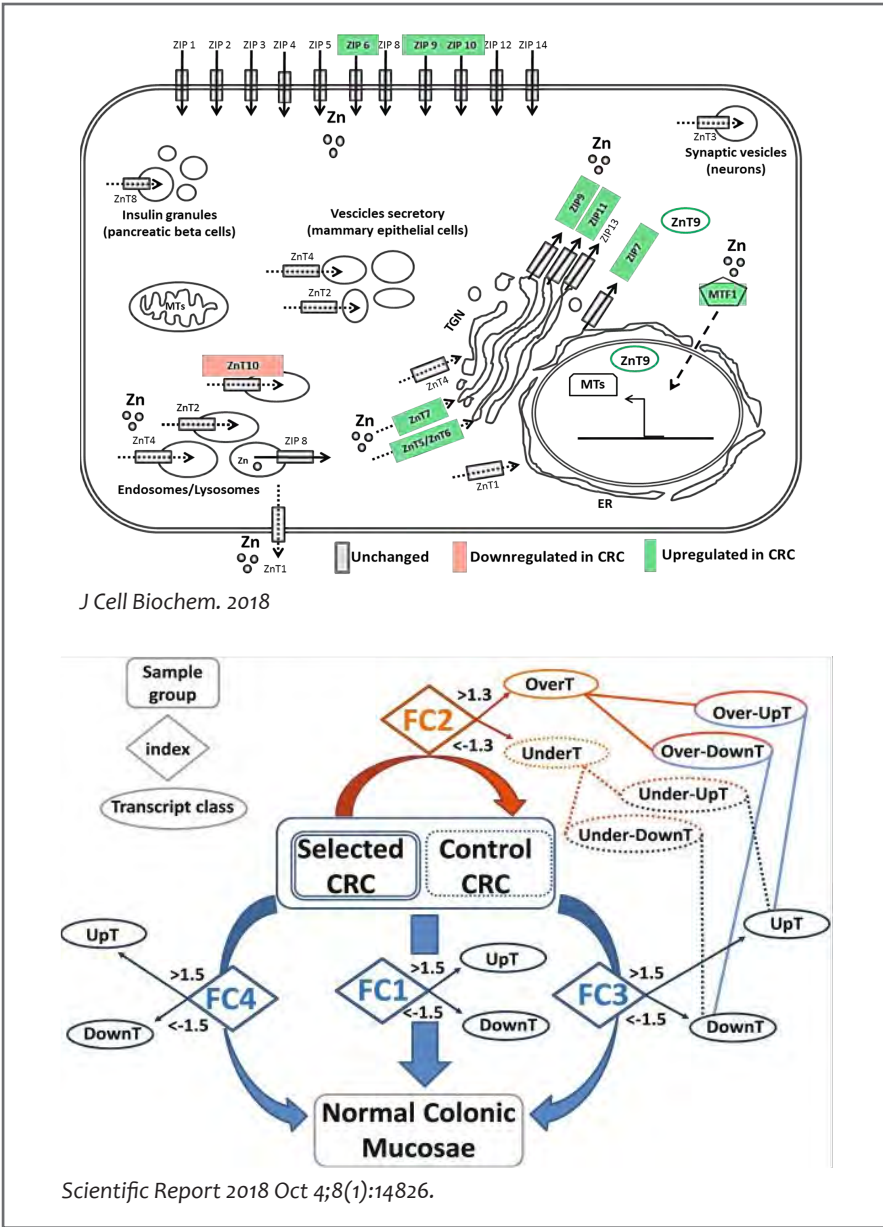
Angela TROVATO SALINARO
Associate Professor

Section of Medical Biochemistry

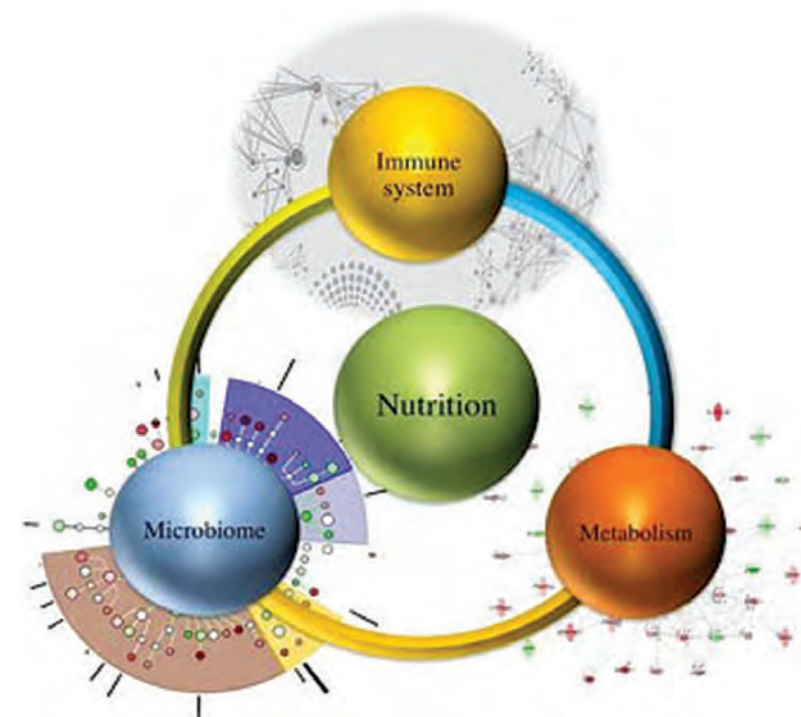
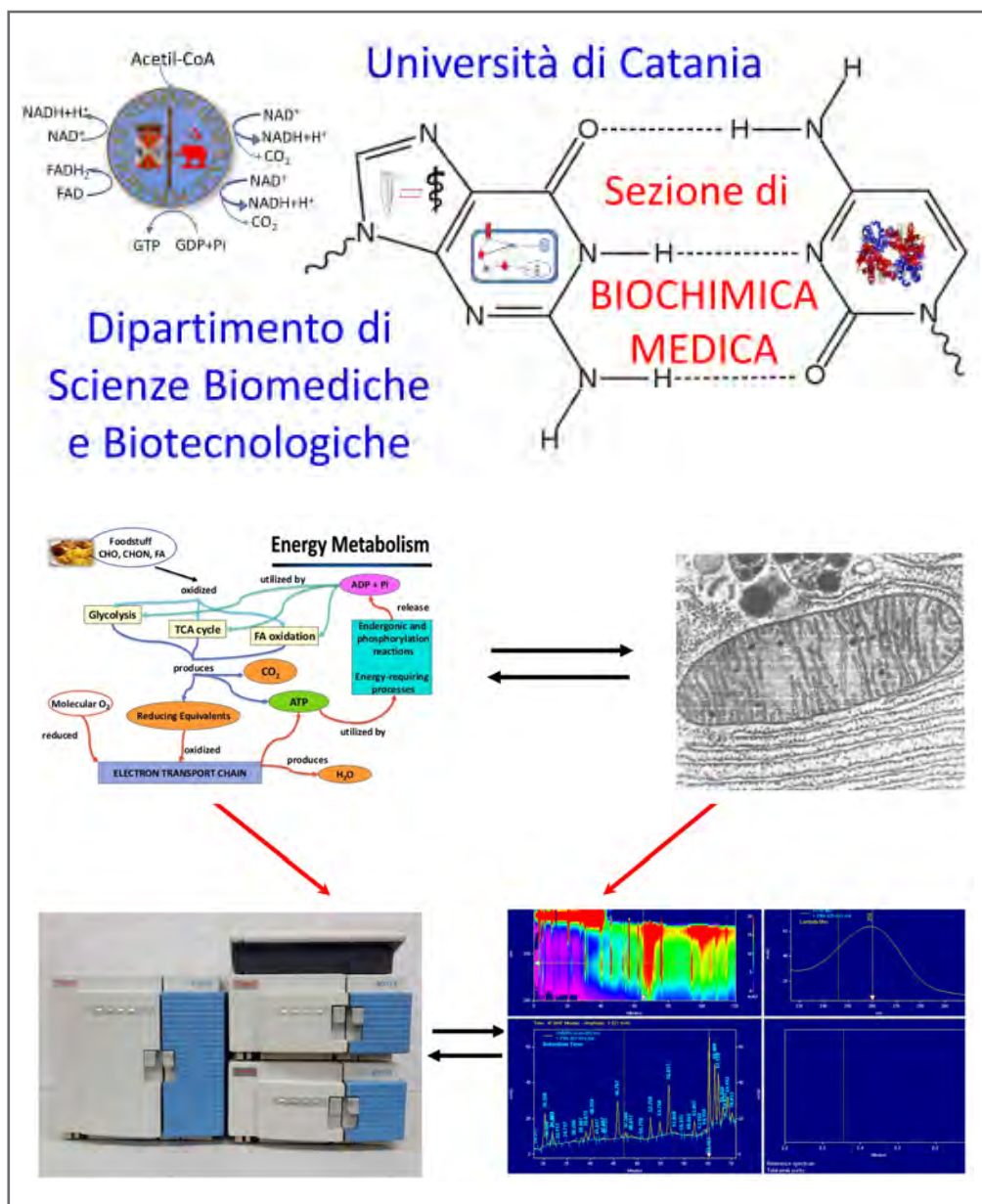
Network of research lines



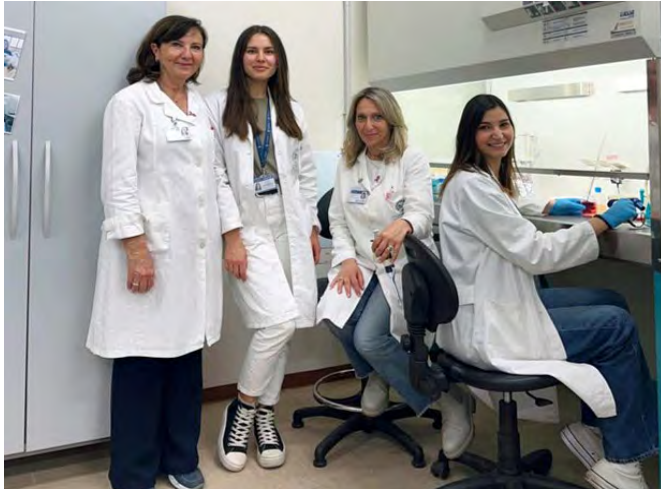
Section of Medical Biochemistry



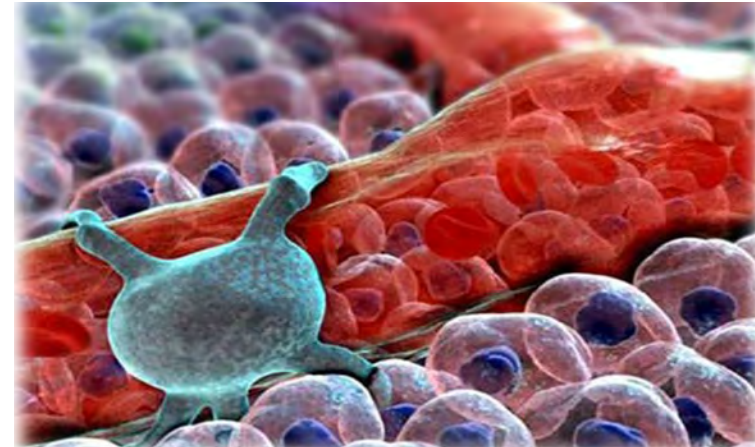
Section of Medical Biochemistry



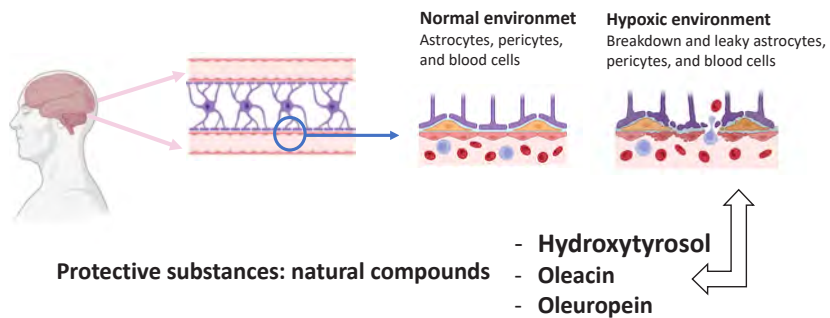
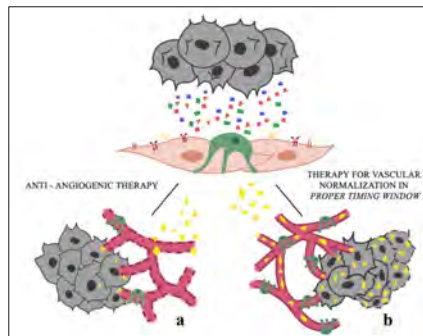
Section of Medical Biochemistry



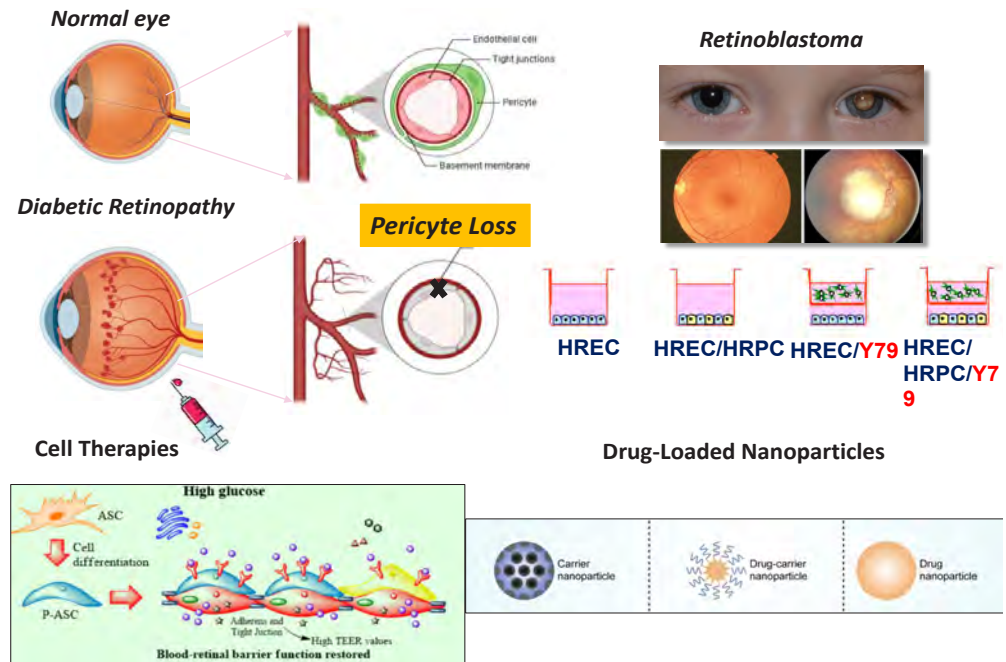
BLOOD BRAIN BARRIER and BLOOD RETINAL BARRIER



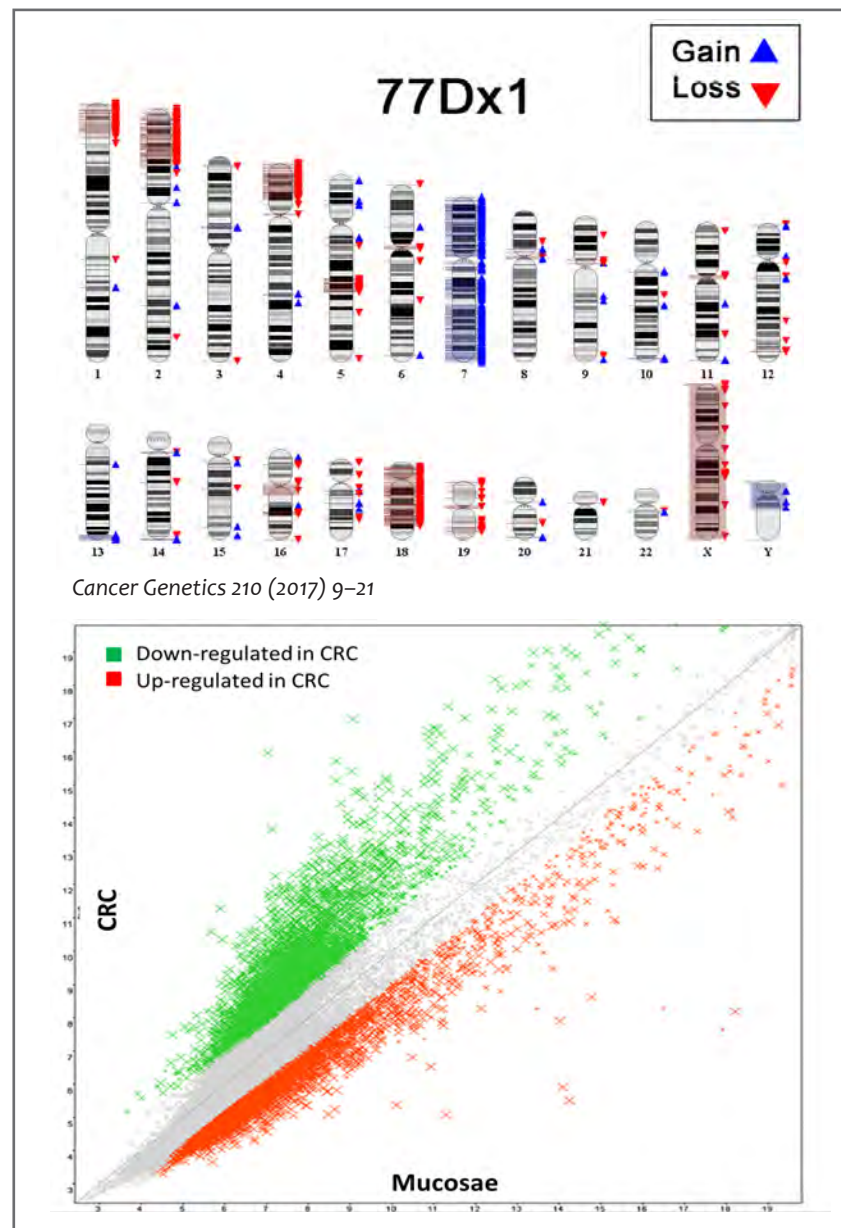
BLOOD-BRAIN BARRIER and TUMOR ANGIOGENESIS



BLOOD-RETINAL BARRIER in DIABETIC RETINOPATHY and RETINOBLASTOMA



Section of Medical Biochemistry



FUNDING AGENCIES

Ricerca corrente Min. Sal. Analisi whole exome sequencing in pazienti affetti da disordini del neurosviluppo e caratterizzati da alti livelli di omozigosità.

Ricerca finalizzata Min. Sal. To unravel the molecular basis of neurodevelopmental disorders.

Programma Operativo Nazionale Ricerca e Competitività. Identificazione di biomarcatori e sviluppo di metodi diagnostici e terapeutici nel campo dell'oncologia e della biologia vascolare.

“FIR 2014”. Classificazione di carcinomi del colon con Instabilità dei Microsatelliti: analisi massiva e parallela per l'identificazione di mutazioni somatiche ed aberrazioni cromosomiche

Progetto europeo PHAR-IN: Lifelong Learning Programme-Competences for industrial pharmacy practice in biotechnology

PO.FERS - Sicilia 2007/2013 - linea 4.1.2.A (2013-2015) “Piattaforma regionale di ricerca traslazionale per la salute”

Bando 2016 “Roche per la Ricerca”

Studio di nuovi marcatori molecolari e radiologici nella diagnosi e prognosi della Fibrosi Polmonare Idiopatica



Ministero della Salute



Ministero dell'Istruzione,
dell'Università e della Ricerca



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“Investiamo per il Vostro Futuro”



Section of Medical Biochemistry

Research paper selection of Biometec (2020-2023)

Heme Oxygenase-1 in Central Nervous System Malignancies.

Sferrazzo G, Di Rosa M, Barone E, Li Volti G, Musso N, Tibullo D, Barbagallo I. J Clin Med. 2020 May 21;9(5):1562. doi: 10.3390/jcm9051562.

Targeted next-generation sequencing identifies the disruption of the SHANK3 and RYR2 genes in a patient carrying a de novo t(1;22)(q43;q13.3) associated with signs of Phelan-McDermid syndrome.

Bonaglia MC, Bertuzzo S, Ciaschini AM, Discepoli G, Castiglia L, Romaniello R, Zuffardi O, Fichera M. Mol Cytogenet. 2020 Jun 11;13:22. doi: 10.1186/s13039-020-00490-6.

Low Molecular Weight Dextran Sulfate (ILB®) Administration Restores Brain Energy Metabolism Following Severe Traumatic Brain Injury in the Rat.

Lazzarino G, Amorini AM, Barnes NM, Bruce L, Mordente A, Lazzarino G, Pietro VD, Tavazzi B, Belli A, Logan A. Antioxidants (Basel). 2020 Sep 10;9(9):850. doi: 10.3390/antiox9090850.

The Interplay between Fe₃O₄ Superparamagnetic Nanoparticles, Sodium Butyrate, and Folic Acid for Intracellular Transport.

Cambria MT, Villaggio G, Laudani S, Pulvirenti L, Federico C, Saccone S, Condorelli GG, Sinatra F. - Int J Mol Sci. 2020 Nov 11;21(22):8473. doi: 10.3390/ijms21228473.

Aberrations of Chromosomes 1 and 16 in Breast Cancer: A Framework for Cooperation of Transcriptionally Dysregulated Genes.

Privitera AP, Barresi V, Condorelli DF. Cancers (Basel). 2021 Mar 30;13(7):1585. doi: 10.3390/cancers13071585.

CCR3 gene overexpression in patients with Down syndrome.

Salemi M, Cannarella R, Marchese G, Salluzzo MG, Ravo M, Barone C, Cordella A, Caniglia S, Castiglione R, Ragalmuto A, Calogero AE, Romano C. Mol Biol Rep. 2021 Jun;48(6):5335-5338. doi: 10.1007/s11033-021-06503-w.

Role of long non-coding RNAs in Down syndrome patients: a transcriptome analysis study.

Salemi M, Cannarella R, Marchese G, Salluzzo MG, Ravo M, Barone C, Giudice ML, Calogero AE, Romano C. Hum Cell. 2021 Nov;34(6):1662-1670. doi: 10.1007/s13577-021-00602-3.

CXCL12/CXCR4 axis supports mitochondrial trafficking in tumor myeloma microenvironment.

Giallongo C, Dulcamare I, Tibullo D, Del Fabro V, Vicario N, Parrinello N, Romano A, Scandura G, Lazzarino G, Conticello C, Li Volti G, Amorini AM, Musumeci G, Di Rosa M, Polito F, Oteri R, Aguenouz M, Parenti R, Di Raimondo F, Palumbo GA. Oncogenesis. 2022 Jan 21;11(1):6. doi: 10.1038/s41389-022-00380-z.

Genetics and Clinical Neuroscience in Intellectual Disability.

Romano C. Brain Sci. 2022 Mar 2;12(3):338. doi: 10.3390/brainsci12030338.

The Global Burden of Food Insecurity Due to COVID-19.

Grosso G. Nutrients. 2022 Aug 30;14(17):3582. doi: 10.3390/nu14173582.

Synthesis of MIL-Modified Fe₃O₄ Magnetic Nanoparticles for Enhancing Uptake and Efficiency of Temozolomide in Glioblastoma Treatment.

Pulvirenti L, Monforte F, Lo Presti F, Li Volti G, Carota G, Sinatra F, Bongiorno C, Mannino G, Cambria MT, Condorelli GG*. - Int J Mol Sci. 2022 Mar 6;23(5):2874. doi: 10.3390/ijms23052874.

Lactate Induces the Expressions of MCT1 and HCAR1 to Promote Tumor Growth and Progression in Glioblastoma.

Longhitano L, Vicario N, Tibullo D, Giallongo C, Broggi G, Caltabiano R, Barbagallo GMV, Altieri R, Baghini M, Di Rosa M, Parenti R, Giordano A, Mione MC, Li Volti G. Front Oncol. 2022 Apr 28;12:871798. doi: 10.3389/fonc.2022.871798.

Mangifera indica L. Leaves as a Potential Food Source of Phenolic Compounds with Biological Activity.

Sferrazzo G, Palmeri R, Restuccia C, Parafati L, Siracusa L, Spampinato M, Carota G, Distefano A, Di Rosa M, Tomasello B, Costantino A, Gulisano M, Li Volti G, Barbagallo I. Antioxidants (Basel). 2022 Jun 30;11(7):1313. doi: 10.3390/antiox11071313.

Biochemical Discrimination of the Down Syndrome-Related Metabolic and Oxidative/Nitrosative Stress Alterations from the Physiologic Age-Related Changes through the Targeted Metabolomic Analysis of Serum.

Lazzarino G, Amorini AM, Mangione R, Saab MW, Di Stasio E, Di Rosa M, Tavazzi B, Lazzarino G, Onder G, Carfi A. Antioxidants (Basel). 2022 Jun 20;11(6):1208. doi: 10.3390/antiox11061208.

The Role of Metals in the Neuroregenerative Action of BDNF, GDNF, NGF and Other Neurotrophic Factors.

Nicoletti VG, Pajer K, Calcagno D, Pajenda G, Nógrádi A. - Biomolecules. 2022 Jul 22;12(8):1015. doi: 10.3390/biom12081015. PMID: 35892326; PMCID: PMC9330237.

Transcript-Targeted Therapy Based on RNA Interference and Antisense Oligonucleotides: Current Applications and Novel Molecular Targets.

Barresi V, Musmeci C, Rinaldi A, Condorelli DF. Int J Mol Sci. 2022 Aug 9;23(16):8875. doi: 10.3390/ijms23168875.

Genomic Landscape Alterations in Primary Tumor and Matched Lymph Node Metastasis in Hormone-Naïve Prostate Cancer Patients.

Russo GI, Bonacci P, Bivona D, Privitera GF, Broggi G, Caltabiano R, Vella J, Lo Giudice A, Asmundo MG, Cimino S, Morgia G, Stefani S, Musso N. Cancers (Basel). 2022 Aug 30;14(17):4212. doi: 10.3390/cancers14174212.

Ultra-Processed Food Consumption and Relation with Diet Quality and Mediterranean Diet in Southern Italy.

Godos J, Giampieri F, Al-Qahtani WH, Scazzina F, Bonaccio M, Grosso G. Int J Environ Res Public Health. 2022 Sep 9;19(18):11360. doi: 10.3390/ijerph191811360.

Guanine inhibits the growth of human glioma and melanoma cell lines by interacting with GPR23.

Garozzo R, Zuccarini M, Giuliani P, Di Liberto V, Mudò G, Caciagli F, Ciccirelli R, Ciruela F, Di Iorio P, Condorelli DF. Front Pharmacol. 2022 Sep 19;13:970891. doi: 10.3389/fphar.2022.970891.

Heme Oxygenase-1 Overexpression Promotes Uveal Melanoma Progression and Is Associated with Poor Clinical Outcomes.

Longhitano L, Broggi G, Giallongo S, Failla M, Puzzo L, Avitabile T, Tibullo D, Distefano A, Pittalà V, Reibaldi M, Zanghì GN, Longo A, Russo A, Caltabiano R, Volti GL, Musso N. Antioxidants (Basel). 2022 Oct 8;11(10):1997. doi: 10.3390/antiox11101997.

Section of Medical Biochemistry

Heme Oxygenase-1 Overexpression Promotes Uveal Melanoma Progression and Is Associated with Poor Clinical Outcomes.

Longhitano L, Broggi G, Giallongo S, Failla M, Puzzo L, Avitabile T, Tibullo D, Distefano A, Pittalà V, Reibaldi M, Zanghì GN, Longo A, Russo A, Caltabiano R, Volti GL, Musso N. Antioxidants (Basel). 2022 Oct 8;11(10):1997. doi: 10.3390/antiox11101997.

Label-Free Enrichment of Circulating Tumor Plasma Cells: Future Potential Applications of Dielectrophoresis in Multiple Myeloma.

Musso N, Romano A, Bonacci PG, Scandura G, Pandino C, Camarda M, Russo GI, Di Raimondo F, Cacciola E, Cacciola R. Int J Mol Sci. 2022 Oct 10;23(19):12052. doi: 10.3390/ijms231912052.

Dietary Fats and Cardio-Metabolic Outcomes in a Cohort of Italian Adults.

Currenti W, Godos J, Alanazi AM, Grosso G, Cincione RI, La Vignera S, Buscemi S, Galvano F. Nutrients. 2022 Oct 14;14(20):4294. doi: 10.3390/nu14204294.

Fish and human health: an umbrella review of observational studies.

Jurek J, Owczarek M, Godos J, La Vignera S, Condorelli RA, Marventano S, Tieri M, Ghelfi F, Titta L, Lafranconi A, Gambera A, Alonzo E, Sciacca S, Buscemi S, Ray S, Del Rio D, Galvano F, Grosso G. Int J Food Sci Nutr. 2022 Nov;73(7):851-860. doi: 10.1080/09637486.2022.2090520.

Antioxidant Activity of Cyanidin-3-O-Glucoside and Verbascoside in an in Vitro Model of Diabetic Retinopathy.

Anfuso CD, Giurdanella G, Longo A, Cosentino A, Agafonova A, Rusciano D, Lupo G. Front Biosci (Landmark Ed). 2022 Nov 17;27(11):308. doi: 10.31083/j.fbl2711308.

Editorial: Nutrition and sleep medicine.

Godos J, Ferri R, Grosso G. Front Nutr. 2022 Dec 13;9:1104427. doi: 10.3389/fnut.2022.1104427.

Pericytes of Stria Vascularis Are Targets of Cisplatin-Induced Ototoxicity: New Insights into the Molecular Mechanisms Involved in Blood-Labyrinth Barrier Breakdown.

Anfuso CD, Cosentino A, Agafonova A, Zappalà A, Giurdanella G, Trovato Salinaro A, Calabrese V, Lupo G. Int J Mol Sci. 2022 Dec 13;23(24):15790. doi: 10.3390/ijms232415790.

Effects of Mangiferin on LPS-Induced Inflammation and SARS-CoV-2 Viral Adsorption in Human Lung Cells.

Spampinato M, Carota G, Sferrazzo G, Fuochi V, Distefano A, Ronsisvalle S, Sipala F, Giuffrida R, Furneri PM, Di Rosa M, Tibullo D, Li Volti G, Barbagallo I. Pharmaceuticals. 2022 Dec 19;14(12):2845. doi: 10.3390/pharmaceutics14122845.

Downregulation of the Astroglial Connexin Expression and Neurodegeneration after Pilocarpine-Induced Status Epilepticus.

Andrioli A, Fabene PF, Mudò G, Barresi V, Di Liberto V, Frinchi M, Bentivoglio M, Condorelli DF. Int J Mol Sci. 2022 Dec 20;24(1):23. doi: 10.3390/ijms24010023.

Rhodiola rosea and Salidroside commonly induce hormesis, with particular focus on longevity and neuroprotection.

Calabrese EJ, Dhawan G, Kapoor R, Agathokleous E, Calabrese V. VChem Biol Interact. 2023 May 9;110540. doi: 10.1016/j.cbi.2023.110540.

Protective effects of alpha lipoic acid (ALA) are mediated by hormetic mechanisms.

Calabrese EJ, Agathokleous E, Dhawan G, Kapoor R, Calabrese V. Food Chem Toxicol. 2023 May 9;113805. doi: 10.1016/j.fct.2023.113805.

Traumatic Brain Injury Alters Cerebral Concentrations and Redox States of Coenzymes Q9 and Q10 in the Rat.

Lazzarino G, Mangione R, Saab M.W., Tavazzi B., Pittalà A., Signoretti S., Di Pietro V., Lazzarino G., Amorini A.M. Antioxidants 2023, 12(5), 985; <https://doi.org/10.3390/antiox12050985> - 23 Apr 2023

Lactate trafficking inhibition restores sensitivity to proteasome inhibitors and orchestrates immuno-microenvironment in multiple myeloma.

Barbato A, Giallongo C, Giallongo S, Romano A, Scandura G, Concetta S, Zuppelli T, Lolicato M, Lazzarino G, Parrinello N, Del Fabro V, Fontana P, Aguennoz M, Li Volti G, Palumbo GA, Di Raimondo F, Tibullo D. Cell Prolif. 2023 Apr;56(4):e13388. doi: 10.1111/cpr.13388

Trait-driven analysis of the 2p15p16.1 microdeletion syndrome suggests a complex pattern of interactions between candidate genes.

Miceli M, Failla P, Saccuzzo L, Galesi O, Amata S, Romano C, Bonaglia MC, Fichera M. Genes Genomics. 2023 Apr;45(4):491-505. doi: 10.1007/s13258-023-01369-7. Epub 2023 Feb 20.

PARK2 microdeletion in a multiplex family with autism spectrum disorder.

Barone R, Cirnigliaro L, Saccuzzo L, Valdesi S, Pettinato F, Prato A, Bernardini L, Fichera M, Rizzo R. Int J Dev Neurosci. 2023 Feb;83(1):121-131. doi: 10.1002/jdn.10246.

Ultra-Processed Food Consumption and Depressive Symptoms in a Mediterranean Cohort.

Godos J, Bonaccio M, Al-Qahtani WH, Marx W, Lane MM, Leggio GM, Grosso G. Nutrients. 2023 Jan 18;15(3):504. doi: 10.3390/nu15030504.

Lactate modulates microglia polarization via IGFBP6 expression and remodels tumor microenvironment in glioblastoma.

Longhitano L, Vicario N, Forte S, Giallongo C, Broggi G, Caltabiano R, Barbagallo GMV, Altieri R, Raciti G, Di Rosa M, Caruso M, Parenti R, Liso A, Busi F, Lolicato M, Mione MC, Li Volti G, Tibullo D. Cancer Immunol Immunother. 2023 Jan;72(1):1-20. doi: 10.1007/s00262-022-03215-3.

Protective Effects of Human Pericyte-like Adipose-Derived Mesenchymal Stem Cells on Human Retinal Endothelial Cells in an In Vitro Model of Diabetic Retinopathy: Evidence for Autologous Cell Therapy.

Lupo G, Agafonova A, Cosentino A, Giurdanella G, Mannino G, Lo Furno D, Romano IR, Giuffrida R, D'Angeli F, Anfuso CD. Int J Mol Sci. 2023 Jan 4;24(2):913. doi: 10.3390/ijms24020913. PMID: 36674425; PMCID: PMC9860961.

Dietary Fats and Depressive Symptoms in Italian Adults.

Currenti W, Godos J, Alanazi AM, Lanza G, Ferri R, Caraci F, Galvano F, Castellano S, Grosso G. Nutrients. 2023 Jan 28;15(3):675. doi: 10.3390/nu15030675.

Challenging the Pleiotropic Effects of Repetitive Transcranial Magnetic Stimulation in Geriatric Depression: A Multimodal Case Series Study.

Nicoletti VG, Fisicaro F, Aguglia E, Bella R, Calcagno D, Cantone M, Concerto C, Ferri R, Mineo L, Pennisi G, Ricceri R, Rodolico A, Saitta G, Torrisi G, Lanza G, Pennisi M. - Biomedicines. 2023 Mar 21;11(3):958. doi: 10.3390/biomedicines11030958. PMID: 36979937; PMCID: PMC10046045



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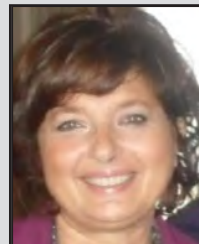
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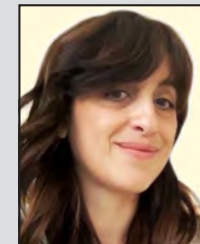
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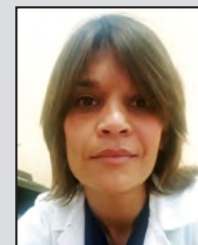
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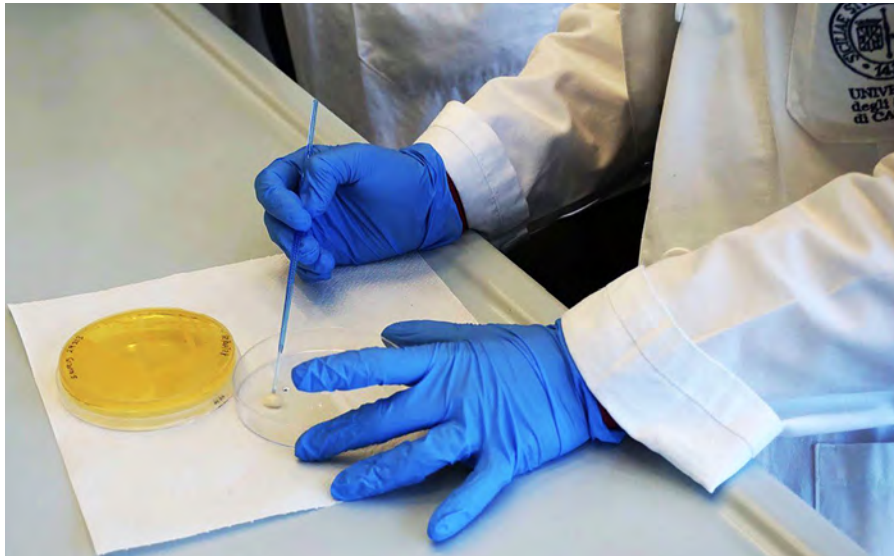
Laura TROVATO
Assistant Professor

Section of Microbiology

RESEARCH LINES

- Evaluation of the in vitro activity of novel anti-Gram-positive and -negative antimicrobial drugs, new alternative compounds, and commercial panels.
- Characterization of Multidrug Resistant Bacteria or ESKAPE pathogens using NGS technology.
- Characterization and sequencing of genetic elements in *Streptococcus* spp, *Enterococcus* spp, *Staphylococcus* spp, *Corynebacterium* spp, *Enterobacteriaceae* and *Acinetobacter baumannii*.
- Molecular assays targeting membrane proteins and PBPs profiling to identify potential drug targets for antibacterial therapies.
- Probiotics and Microbiome: screening and use of microorganisms with probiotic characteristics; metagenomic analysis of the oral microbiota using NGS.
- Traditional and molecular diagnostics and Bacterial epidemiology
- Virulence and persistence of *Staphylococcus* spp, *Pseudomonas aeruginosa* and *Streptococcus pyogenes*
- Study of internalization of *S.aureus* strains and other pathogens, from persistent and recurrent infections in human cell lines, by ex-vivo model and imaging flow-cytometry analysis and study of the Host-Pathogen interaction
- Symbiotics and aging eye: Evaluation of ocular microbiome.
- Drug delivery system for antimicrobial and antimycotic agents
- Amensalistic behavior of human isolates of lactic bacteria
- Studies of natural and synthetic antimicrobials
- Molecular mechanisms in bacterial translocation of the blood brain and blood retinal barriers
- Phage discovery
- Molecular diagnostics and evaluation of humoral and cell-mediated immune response of viral infections of immunocompromised hosts with particular regard to subjects undergoing transplantation of stem cells.
- Study of characterization, diffusion and phylogenicity of SARS-CoV-2 Virus
- Study of the role of human papillomavirus (HPV) in infertility
- Diagnosis, prevention and treatment of infections during pregnancy and at-risk newborn.
- Helminthiasis among migrants in Sicily: A possible focus for re-emerging neurocysticercosis in Europe
- Environmental distribution of *Cryptococcus neoformans* and *C. gattii* around the Sicily basin
- Susceptibility of *Aspergillus terreus* species complex infections
- Environmental isolates of multi-azole-resistant *Aspergillus* spp. in Southern Italy

Section of Microbiology



Section of Microbiology

CLINICAL UNITS



U.O.C. Clinical Laboratory

Policlinico Universitario G.Rodolico - San Marco

Head: Guido Scalia



- Regional reference laboratory for sequencing of SARS-COV2

- Sequencing service

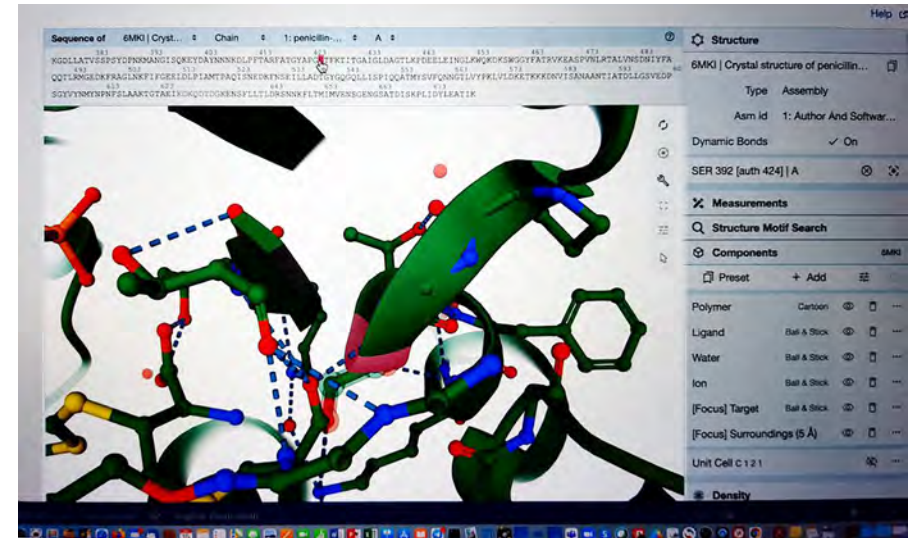
Policlinico Universitario G.Rodolico - San Marco

Head: Stefania Stefani



U.O.C. Regional Microbiology Reference laboratory for opportunistic infections

Head : Maria Antonietta Toscano



Section of Microbiology

INTERNATIONAL COLLABORATIONS



Section of Microbiology

FUNDING AGENCIES / ACHIEVEMENTS OF JUNIOR RESEARCHERS



An Integrated Approach To Tackle The Interplay Among Adaptation, Stressful Conditions And Antimicrobial Resistance Of Challenging Pathogens



Transition from asymptomatic colonization to disease by human respiratory-tract bacteria as a target for vaccines and antimicrobial therapy: The CoDiCo (colonisation to disease concepts) project



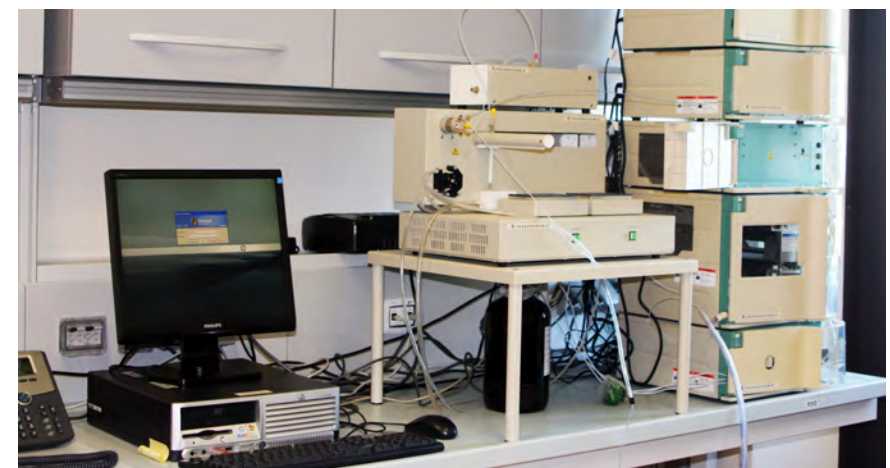
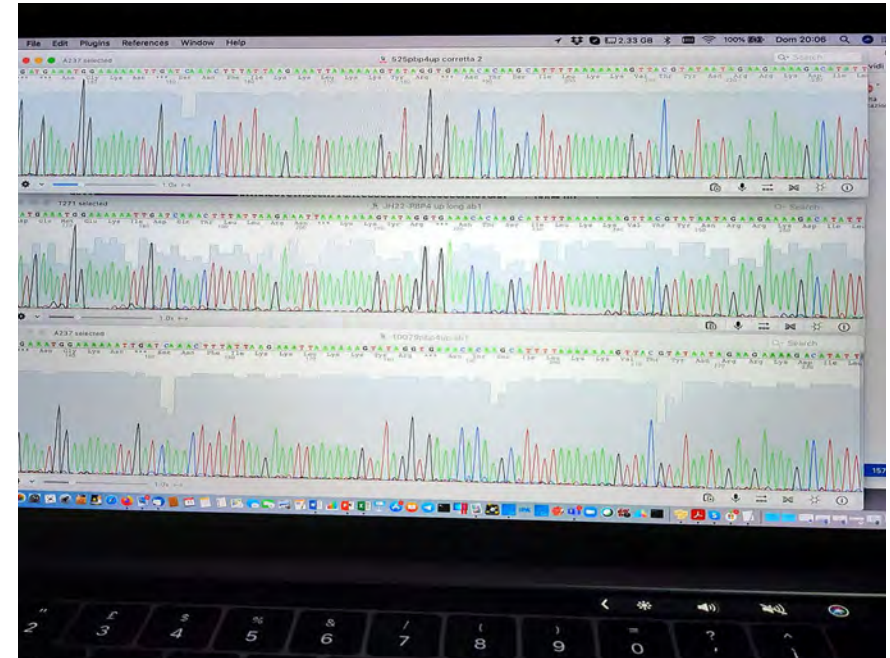
Grant of European Union -FSE-REACT-EU, PON Ricerca e Innovazione 2014-2020 DM1062/2021



One Health Basic and Translational Research Actions addressing Unmet Needs on Emerging Infectious Diseases. MUR PNRR Extended Partnership initiative on Emerging Infectious Diseases



European Union (NextGeneration EU), through the MUR-PNRR project SAMOTHRACE



Section of Microbiology

Research paper selection of Biometec (2020-2023)

COLR *Acinetobacter baumannii* sRNA Signatures: Computational Comparative Identification and Biological Targets.

Cafiso V, Stracquadanio S, Lo Verde F, Dovero V, Zega A, Pigola G, Aranda J, Stefani S. Front Microbiol. 2020 Jan 17;10:3075.

Detection of methicillin-resistant *Staphylococcus aureus* persistence in osteoblasts using imaging flow cytometry.

Bongiorno D, Musso N, Lazzaro LM, Mongelli G, Stefani S, Campanile F. Microbiology open. 2020 May;9(5):e1017. doi: 10.1002/mbo3.1017.

Genomic and Long-Term Transcriptomic Imprints Related to the Daptomycin Mechanism of Action Occurring in Daptomycin and Methicillin Resistant *Staphylococcus aureus* under Daptomycin Exposure.

Cafiso V, Lo Verde F, De Guidi I, Stracquadanio S, Zega A, Pigola G, Stefani S. Front Microbiol. 2020 Aug 14;11:1893.

Role of the Transcription Factor Yin Yang 1 and Its Selectively Identified Target Survivin in High-Grade B-Cells Non-Hodgkin Lymphomas: Potential Diagnostic and Therapeutic Targets.

Vivarelli S, Falzone L, Ligresti G, Candido S, Garozzo A, Magro GG, Bonavida B, Libra M. Int J Mol Sci. 2020 Sep 3;21(17):6446. doi: 10.3390/ijms21176446.

Potential Associations Among Alteration of Salivary miRNAs, Saliva Microbiome Structure, and Cognitive Impairments in Autistic Children.

Ragusa M, Santagati M, Mirabella F, Lauretta G, Cirnigliaro M, Brex D, Barbagallo C, Domini CN, Gulisano M, Barone R, Trovato L, Oliveri S, Mongelli G, Spitale A, Barbagallo D, Di Pietro C, Stefani S, Rizzo R, Purrello M. Int J Mol Sci. 2020;21(17):6203. doi: 10.3390/ijms21176203 Q1 IF:5.9

Droplet digital PCR for the detection and monitoring of *Legionella pneumophila*.

Falzone L, Gattuso G, Lombardo C, Lupo G, Grillo CM, Spandidos DA, Libra M, Salmeri M. Int J Mol Med. 2020 Nov;46(5):1777-1782. doi: 10.3892/ijmm.2020.4724. Epub 2020 Sep 14. PMID: 33000184

In Vitro Activity of Dalbavancin against Refractory Multidrug-Resistant (MDR) in *Staphylococcus aureus* Isolates.

Bongiorno D, Lazzaro LM, Stefani S, Campanile F. Antibiotics (Basel). 2020 Dec 3;9(12):865.

In vitro fosfomycin study on concordance of susceptibility testing methods against ESBL and carbapenem-resistant Enterobacteriaceae.

Aprile A, Scalia G, Stefani S, Mezzatesta ML. J Glob Antimicrob Resist. 2020 Dec;23:286-289. doi: 10.1016/j.jgar.2020.09.022.

Gold standard susceptibility testing of fosfomycin in *Staphylococcus aureus* and Enterobacterales using a new agar dilution panel.

Campanile F, Wootton M, Davies L, Aprile A, Mirabile A, Pomponio S, Demetrio F, Bongiorno D, Walsh TR, Stefani S, Mezzatesta ML. J Glob Antimicrob Resist. 2020 Dec;23:334-337.

New anti sars-cov-2 targets for quinoline derivatives chloroquine and hydroxychloroquine.

Gentile, D., Fuochi, V., Rescifina, A., Furneri, P.M. International Journal of Molecular Sciences, (2020)21 (16), art. no. 5856, pp. 1-16. doi: 10.3390/ijms21165856.

Dual-drugs delivery in solid lipid nanoparticles for the treatment of *Candida albicans* mycosis

Carbone, C., Fuochi, V., Zielińska, A., Musumeci, T., Souto, E. B., Bonaccorso, A., ... & Furneri, P. M. (2020). Colloids and Surfaces B: Biointerfaces, 186, 110705.

***Lactobacillus rhamnosus* AD3 as a Promising Alternative for Probiotic**

Stivala A, Carota G, Fuochi V, Furneri PM. Products. Biomolecules. 2021 Jan 13;11(1):94. doi: 10.3390/biom11010094.

Antimicrobial, Antioxidant, and Cytotoxic Activities of *Juglans regia* L. Pellicle Extract.

D'Angeli F, Malfa GA, Garozzo A, Li Volti G, Genovese C, Stivala A, Nicolosi D, Attanasio F, Bellia F, Ronsisvalle S, Acquaviva R. Antibiotics (Basel). 2021 Feb 4;10(2):159. doi: 10.3390/antibiotics10020159.

Antimicrobial properties of *Lactobacillus* cell-free supernatants against multidrug-resistant urogenital pathogens.

Scillato M, Spitale A, Mongelli G, Privitera GF, Mangano K, Cianci A, Stefani S, Santagati M. Microbiology open. 2021 Feb;10(2):e1173. doi: 10.1002/mbo3.1173.

***Staphylococcus aureus* ST228 and ST239 as models for expression studies of diverse markers during osteoblast infection and persistence.**

Bongiorno D, Musso N, Caruso G, Lazzaro LM, Caraci F, Stefani S, Campanile F. Microbiologyopen. 2021 Mar;10(2):e1178. doi: 10.1002/mbo3.1178.

Resistance to Echinocandins Complicates a Case of *Candida albicans* Bloodstream Infection: A Case Report.

Trovato L, Bongiorno D, Calvo M, Migliorisi G, Boraccino A, Musso N, Oliveri S, Stefani S, Scalia G. J Fungi (Basel). 2021 May 21;7(6):405. doi: 10.3390/jof7060405.

Colistin Resistance Onset Strategies and Genomic Mosaicism in Clinical *Acinetobacter baumannii* Lineages.

Cafiso V, Stracquadanio S, Dovero V, Lo Verde F, Zega A, Pigola G, Barnini S, Ghelardi E, Stefani S. Pathogens. 2021 Nov 20;10(11):1516. doi: 10.3390/pathogens10111516.

Section of Microbiology

Bacterial contamination of bone allografts in the tissue banks: a systematic review and meta-analysis.

Baseri N, Meysamie A, **Campanile F**, Hamidieh AA, Jafarian A. J Hosp Infect. 2021 Nov 6;S0195-6701(21)00384-4. doi: 10.1016/j.jhin.2021.10.020

Natural Substances in the Fight of SARS-CoV-2: A Critical Evaluation Resulting from the Cross-Fertilization of Molecular Modeling Data with the Pharmacological Aspects.

Gentile D, **Patamia V**, **Fuochi V**, **Furneri PM**, Rescifina A. Curr Med Chem. 2021;28(40):8333-8383. doi: 10.2174/0929867328666210614114032

Impact of PBP4 Alterations on β -Lactam Resistance and Ceftobiprole Non-Susceptibility Among Enterococcus faecalis Clinical Isolates.

Lazzaro LM, Cassisi M, **Stefani S**, **Campanile F**. Frontiers in Cellular and Infection Microbiology 2022 Jan 20;11:816657. doi: 10.3389/fcimb.2021.816657.

In Vitro Activity of Sulbactam–Durlobactam against Carbapenem-Resistant Acinetobacter baumannii Clinical Isolates: A Multicentre Report from Italy.

Segatore B, Piccirilli A, Cherubini S, Principe L, Alloggia G, **Mezzatesta ML**, **Salmeri M**, Di Bella S, Migliavacca R, Piazza A, Meroni E, Fazii P, Visaggio D, Visca P, Cortazzo V, De Angelis G, Pompilio A, Perilli M. Antibiotics, 2022, 11(8), 1136 doi: 10.3390/antibiotics11081136.

Microbiome differences in periodontal, peri-implant, and healthy sites: a cross-sectional pilot study.

Barbagallo G, **Santagati M**, Guni A, Torrisi P, Spitale A, **Stefani S**, Ferlito S, Nibali L. Clin Oral Investig. 2022 Mar;26(3):2771-2781. doi: 10.1007/s00784-021-04253-4

SARS-CoV-2's high rate of genetic mutation under immune selective pressure: from oropharyngeal B.1.1.7 to intrapulmonary B.1.533 in a vaccinated patient.

Musso N, Maugeri JG, **Bongiorno D**, **Stracquadanio S**, Bartoloni G, **Stefani S**, Di Stefano ED. Int J Infect Dis. 2022 May;118:169-172. doi: 10.1016/j.ijid.2022.02.044.

Orobanche crenata Forssk. Extract Affects Human Breast Cancer Cell MCF-7 Survival and Viral Replication.

Genovese C, **Garozzo A**, D'Angeli F, Malfa GA, Bellia F, Tomasello B, Nicolosi D, Malaguarnera R, Ronsisvalle S, Guadagni F, Acquaviva R. Cells. 2022 May 19;11(10):1696. doi: 10.3390/cells11101696.

Streptococcus salivarius 24SMBc Genome Analysis Reveals New Biosynthetic Gene Clusters Involved in Antimicrobial Effects on Streptococcus pneumoniae and Streptococcus pyogenes.

Vertillo Aluisio, G., Spitale, A., Bonifacio, L., Privitera G.F., **Stivala A.**, **Stefani, S.**, **Santagati, M.** Microorganisms, 2022, 10(10), 2042.

Extract Affects Human Breast Cancer Cell MCF-7 Survival and Viral Replication.

Genovese C, **Garozzo A**, D'Angeli F, Malfa GA, Bellia F, Tomasello B, Nicolosi D, Malaguarnera R, Ronsisvalle S, Guadagni F, Acquaviva R. Cells. 2022 May 19; 11(10):1696. doi: 10.3390/cells11101696.

Overview of the Clinical and Molecular Features of Legionella Pneumophila: Focus on Novel Surveillance and Diagnostic Strategies.

Gattuso, G., Rizzo, R., Lavoro, A., **Mezzatesta, M.L.**, **Salmeri, M.** Antibiotics, 2022, 11(3), 370 doi: 10.3390/antibiotics11030370.

Heteroaryl-Ethylenes as New Effective Agents for High Priority Gram-Positive and Gram-Negative Bacterial Clinical Isolates.

Bivona DA, Mirabile A, Bonomo C, Bonacci PG, **Stracquadanio S**, Marino A, **Campanile F**, Bonaccorso C, Fortuna CG, **Stefani S**, Musso N, **Bongiorno D**. Antibiotics (Basel). 2022 Jun 3;11(6):767. doi: 10.3390/antibiotics11060767.

Omic insights into various ceftazidime-avibactam-resistant Klebsiella pneumoniae isolates from two southern Italian regions.

Bongiorno D, Bivona DA, Cicino C, Trecarichi EM, Russo A, Marascio N, **Mezzatesta ML**, Musso N, Privitera GF, Quirino A, Scarlata GGM, Matera G, Torti C, **Stefani S**. Front Cell Infect Microbiol. 2023 Jan 5;12:1010979. doi: 10.3389/fcimb.2022.1010979. eCollection 2022.

Soluble peptidoglycan fragments produced by Limosilactobacillus fermentum with antiproliferative activity are suitable for potential therapeutic development: A preliminary report.

Fuochi V, Spampinato M, Distefano A, Palmigiano A, **Garozzo D**, Zagni C, Rescifina A, Li Volti G, **Furneri PM**. Front Mol Biosci. 2023 Feb 15;10:1082526. doi: 10.3389/fmolb.2023.1082526. eCollection 2023.

Yeast Bloodstream Infections in the COVID-19 Patient: A Multicenter Italian Study (FiCoV Study).

Prigitano A, Blasi E, Calabrò M, Cavanna C, Cornetta M, Farina C, Grancini A, Innocenti P, Lo Cascio G, Nicola L, **Trovato L**, Cogliati M, Esposto MC, Tortorano AM, Romanò L, On Behalf Of The FiCoV Study Group. J Fungi (Basel). 2023 Feb 20;9(2):277. doi: 10.3390/jof9020277.

Lactobacillus rhamnosus GG cell-free supernatant as a novel anti-cancer adjuvant.

Salemi R, Vivarelli S, Ricci D, Scillato M, **Santagati M**, Gattuso G, Falzone L, Libra M. J Transl Med. 2023 Mar 14;21(1):195. doi: 10.1186/s12967-023-04036-3.

New Antimicrobial Resistance Strategies: An Adaptive Resistance Network Conferring Reduced Glycopeptide Susceptibility in VISA.

Aguglia E, Chines E, **Stefani S**, **Cafiso V**. Antibiotics (Basel). 2023 Apr 19;12(4):783. doi: 10.3390/antibiotics12040783.

Section of Pharmacology

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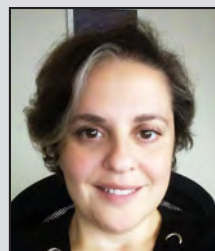
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Gian Marco LEGGIO
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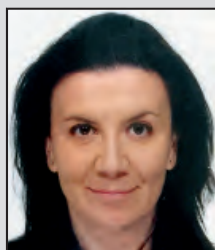
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Michele VECCHIO
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Giulia DI BENEDETTO
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Assistant Professor



Gianluca ROMANO
Assistant Professor



Sebastiano TORRISI
Assistant Professor

Section of Pharmacology

RESEARCH LINES

Pharmacology of neurodegenerative disease

- The role of astrocytes in BBB function in AD
- Microglia-neuron crosstalk in AD
- Neuronal mechanisms linked to GPCR in health and disease
- Neuroinflammation in neurodegenerative disorders: molecular targets and new drugs

Clinical Pharmacology

- Efficacy and safety of drugs in CNS disorders: multicenter studies
- Appropriateness and economic impact of drugs, biologics, biosimilars and medical devices prescription in hospital setting

Neuropsychopharmacology

- Study of the dopamine D3 receptor-mediated signaling in the pathophysiology of schizophrenia, substance use disorders and mood disorders
- Neurobiology of PTSD
- Gut-brain axis related mechanisms for neuropsychiatric disorders
- Role of the endogenous cannabinoid system in health and disease

Rehabilitation Medicine

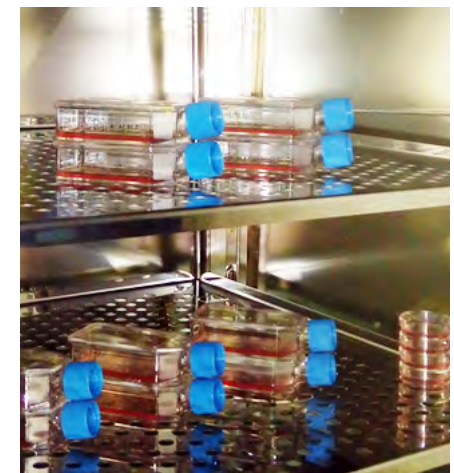
- Performance measures in individuals with unilateral lower-limb amputation
- Training with Functional Electrical Stimulation on persons with spinal cord lesion

Ocular Pharmacology

- Ocular pharmacology and drug delivery
- Retinal degenerative diseases including diabetic retinopathy, age-related macular degeneration and glaucoma

Vascular Pharmacology

- Study of endothelial function and dysfunction
- Angiogenesis

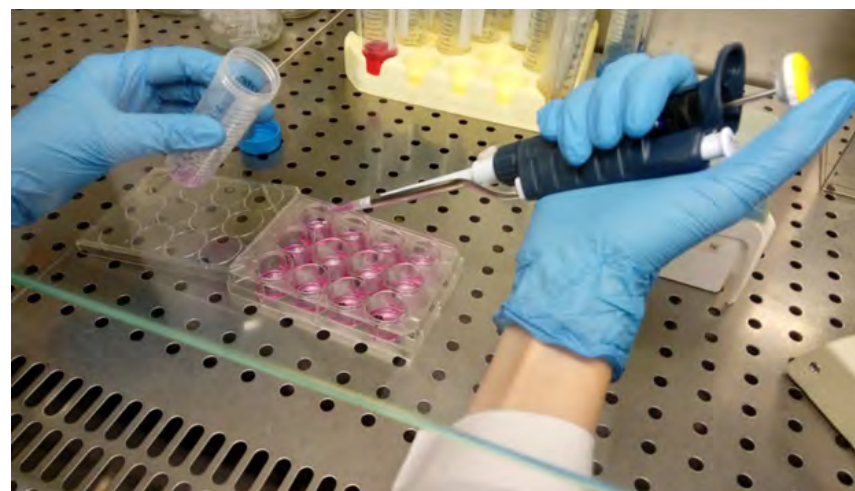
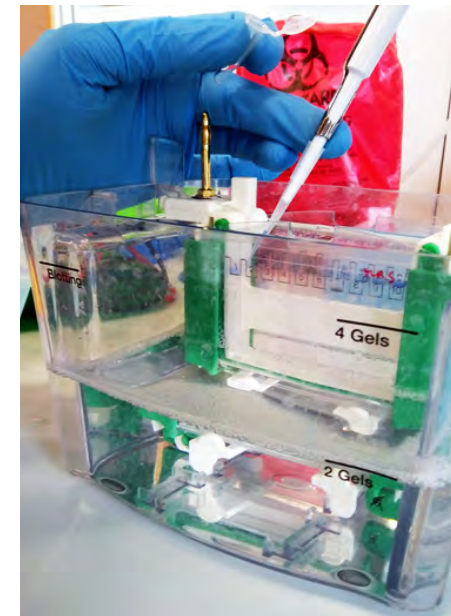


Section of Pharmacology

FUNDING AGENCIES



ACHIEVEMENTS OF YOUNG RESEARCHERS



Section of Pharmacology

CLINICAL UNITS



UO-PID Clinical Pharmacology Program and Regional Pharmacovigilance Centre

A.O.U. Policlinico "G.Rodolico - San Marco" Catania, Italy

Head: Filippo Drago



UO-PID Clinical Toxicology

A.O.U. Policlinico "G.Rodolico - San Marco" Catania, Italy

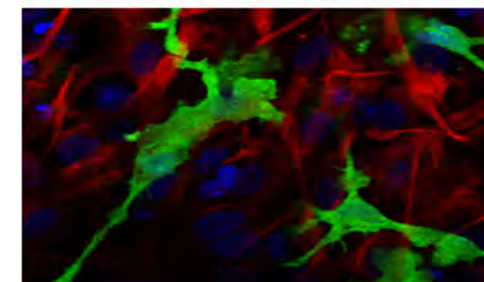
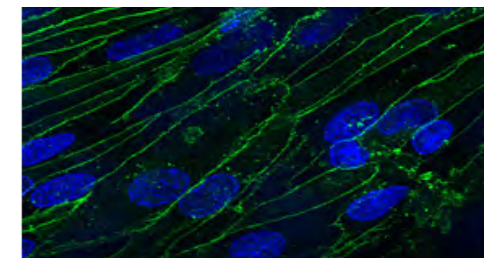
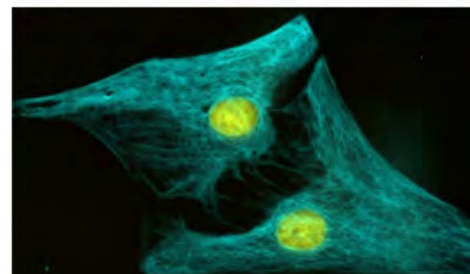
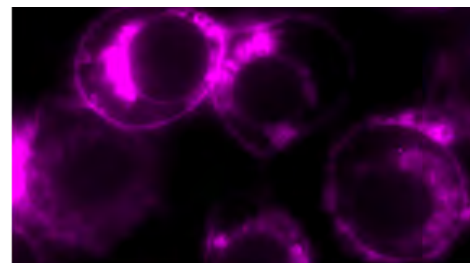
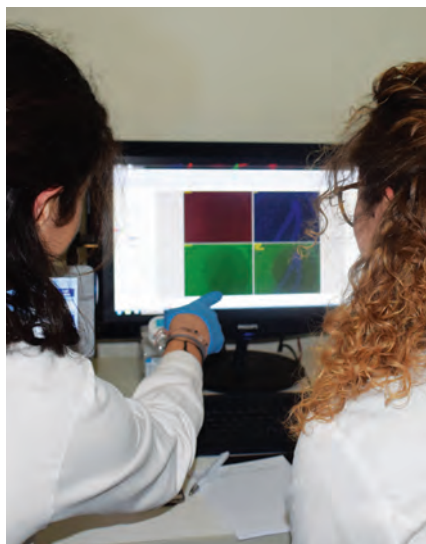
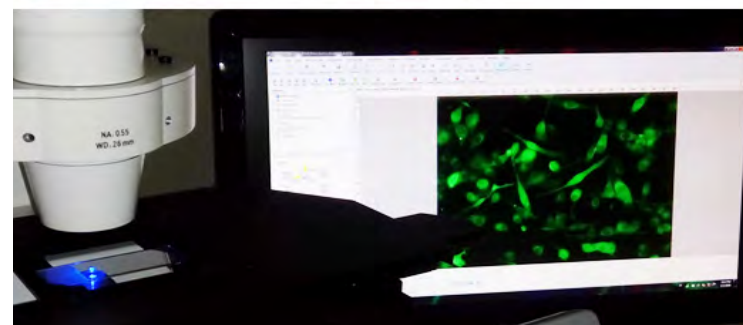
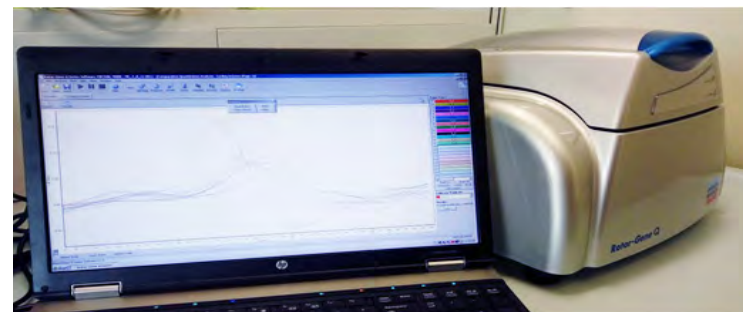
Head: Renato Bernardini



UO Laboratory of Physical and Rehabilitation Medicine

A.O.U. Policlinico "G.Rodolico - San Marco" Catania, Italy

Head: Michele Vecchio



Section of Pharmacology

INTERNATIONAL COLLABORATION

Laboratory of Psychiatry and Experimental Alzheimer's Research, Medical University of Innsbruck, A-6020 Innsbruck, Austria

Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, Prague, Czech Republic

Department of Biomolecular Sciences, Weizmann Institute of Sciences, Rehovot, Israel

Department of Brain Sciences, Weizmann Institute of Science, Rehovot, Israel

Department of Psychological and Brain Sciences, Indiana University Bloomington, USA

Laboratory of Neuropharmacology-NeuroPhar, Departament de Ciències Experimentals i de la Salut (DCEXS), Universitat Pompeu Fabra (UPF), Parc de Recerca Biomèdica de Barcelona (PRBB), Spain

Department of Ophthalmology, University of Lausanne, Fondation Asile des Aveugles, Jules Gonin Eye Hospital, Lausanne, Switzerland

Bascom Palmer Eye Institute, University of Miami Health System, Miami, FL, USA

Eye Research Institute, Oakland University, Rochester, MI, USA

Max-Planck Institute of Psychiatry, Munich, Germany.

CEITEC/Masaryk University, Brno, Czech Republic

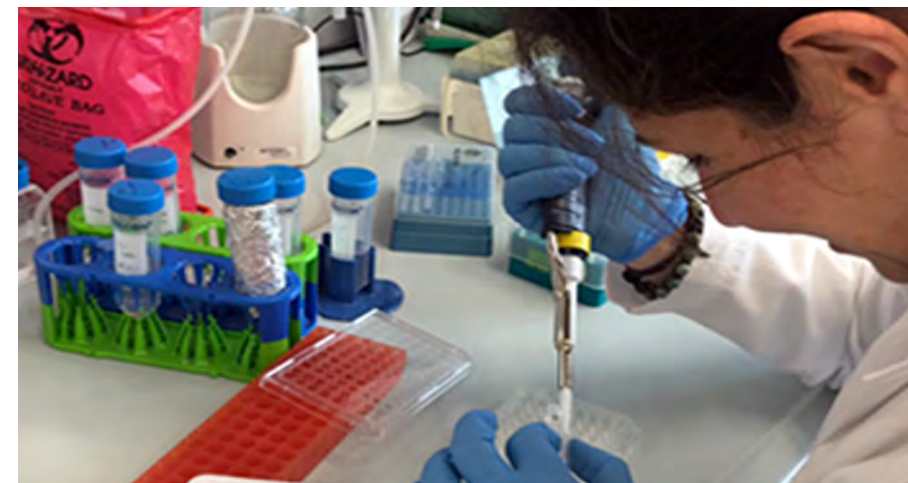
Institute for Drug Research, Faculty of Medicine, Hebrew University of Jerusalem, Jerusalem

NeuroCentre Magendie, Bordeaux, France

National Institute of Mental Health, Klecany, Czech Republic

Universite Laval, Quebec City, Canada

Dept. of Anatomy & Neuroscience, University College Cork, Ireland



Section of Pharmacology

FUNDING

PRIN 2017 “Bioenergetics and inflammation: novel insights for new therapeutic approaches in Alzheimer’s Disease”.

Piano di incentivi per la ricerca di ateneo 2020/2022 (Pia.ce.ri.) - Linea di intervento 2. Dipartimento 3. MD-RESETT-GLIO

PRIN 2017 “Dopamine - Dysbindin genetic interaction: a multidisciplinary approach to characterize cognitive phenotypes of schizophrenia and develop personalized treatments”

Progetto interdipartimentale PIACERI 2020/22 Linea2 NanoRet (PI)

Bando Chance 2020 “Novel insights in neuroinflammation and angiogenesis to target retinal diseases” (PI)

PRIN 2020 “New pharmacological targets to cure disabling retinal diseases” 2020FR7T (National PI)

POS TRAIETTORIA 4 “Riposizionamento di farmaci nelle malattie neurologiche rare del sistema nervoso in età pediatrica” Acronimo: RiFaRaSiNePe

PNRR-MAD-2022-1237615 Relieving the burden of Post-Traumatic Stress Disorder: disentangle mechanisms of vulnerability and resilience to tailor personalized therapeutic intervention. Acronym: Relieving-PTSD”

Programma: PO.FESR SICILIA 2014-2020 - Micro e nano sistemi innovativi per la cura efficace del Tumore al Fegato” – Acronimo “LiverSmartDrug” – Azione 1.1.5 “Sostegno all’avanzamento tecnologico delle imprese attraverso il finanziamento di linee pilota e azioni di validazione precoce dei prodotti e di dimostrazione su larga scala”

Progetto ricerca finalizzata Regione Sardegna 2022-2024: PNRR-MAD-2022-12375802 “Modulation of neuroinflammation and astrocyte activity in Alzheimer’s disease: functional consequences and therapeutic perspectives”.

PRIN 2017 “Antidepressant drugs effect on the gender-dependent development of depressive behavior induced by early neuroinflammatory hit: a multitask approach from mice to patients”

Progetto di Ricerca fondo integrativo speciale per la ricerca (FIRS) 2020 Title: Disturbi Indotti dall’Esposizione prenatale al THC: Approccio Multidisciplinare ed Effetti di Integratori nella dieta materna

“PIACERI-STARTING GRANT” 2020. Title of the Project: “Phytocannabinoids and schizoaffective disorders: a multidisciplinary approach focusing on adolescence as critical window for pharmacological intervention”.

PRIN 2017 Selective mGlu3 metabotropic glutamate receptor ligands as new potential therapeutic agents in experimental models of parkinsonism.

Financial support from several pharmaceutical companies

Section of Pharmacology

Research paper selection of Biometec (2020-2023)

Gene expression, proteome and calcium signaling alterations in immortalized hippocampal astrocytes from an Alzheimer's disease mouse model.

Rocchio F, Tapella L, Manfredi M, **Chisari M**, Ronco F, Ruffinatti FA, Conte E, Canonico PL, **Sortino MA**, Grilli M, Marengo E, Genazzani AA, Lim D. - Cell Death Dis. 2020 Apr 16;11(4):236. doi: 10.1038/s41419-020-2451-y.

Novel indole derivatives targeting HuR-mRNA complex to counteract high glucose damage in retinal endothelial cells.

Platania CBM, Pittalà V, Pascale A, Marchesi N, Anfuso CD, Lupo G, Cristaldi M, Olivieri M, Lazzara F, Di Paola L, **Drago F**, **Bucolo C**. - Biochem Pharmacol. 2020 May;175:113908. doi: 10.1016/j.bcp.2020.113908.

Effects of protein-protein interface disruptors at the ligand of the glucocorticoid-induced tumor necrosis factor receptor-related gene (GITR).

Platania CBM, Ronchetti S, Riccardi C, Migliorati G, Marchetti MC, Di Paola L, Lazzara F, **Drago F**, Salomone S, **Bucolo C**. - Biochem Pharmacol. 2020 Aug;178:114110. doi: 10.1016/j.bcp.2020.114110.

The immune system on the TRAIL of Alzheimer's disease.

Burgaletto C, Munafò A, **Di Benedetto G**, De Francisci C, Caraci F, Di Mauro R, **Bucolo C**, **Bernardini R**, **Cantarella G**. - J Neuroinflammation. 2020 Oct 13;17(1):298. doi: 10.1186/s12974-020-01968-1.

P2X7 receptor antagonism preserves retinal ganglion cells in glaucomatous mice.

Romano GL, Amato R, Lazzara F, Porciatti V, Chou TH, **Drago F**, **Bucolo C**. - Biochem Pharmacol. 2020 Oct;180:114199. doi: 10.1016/j.bcp.2020.114199.

A novel arousal-based individual screening reveals susceptibility and resilience to PTSD-like phenotypes in mice.

Torrisi SA, Lavanco G, Maurel OM, Gulisano W, Laudani S, Geraci F, Grasso M, Barbagallo C, Caraci F, **Bucolo C**, Ragusa M, Papaleo F, Campolongo P, Puzzo D, **Drago F**, Salomone S, **Leggio GM**. - Neurobiol Stress. 2020 Dec 24;14:100286. doi: 10.1016/j.ynstr.2020.100286.

Lights and Shadows on Managing Immune Checkpoint Inhibitors in Oncology during the COVID-19 Era.

Burgaletto C, Brunetti O, Munafò A, **Bernardini R**, Silvestris N, **Cantarella G**, Argentiero A. - Cancers (Basel), 2021, 13:1906. doi: 10.3390/cancers13081906.

Crosstalk between the transcriptional regulation of dopamine D2 and cannabinoid CB1 receptors in schizophrenia: Analyses in patients and in perinatal Δ9-tetrahydrocannabinol-exposed rats.

Di Bartolomeo M, Stark T, Maurel OM, Iannotti FA, Kuchar M, Ruda-Kucerova J, Piscitelli F, Laudani S, Pekarik V, Salomone S, Arosio B, Mechoulam R, Maccarrone M, **Drago F**, Wotjak CT, Di Marzo V, Vismara M, Dell'Osso B, D'Addario C, **Micale V**. - Pharmacol Res. 2021 Feb;164:105357. doi: 10.1016/j.phrs.2020.105357.

A neuroactive steroid with a therapeutically interesting constellation of actions at GABA A and NMDA receptors.

Ziolkowski L, Mordukhovich I, Chen DM, **Chisari M**, Shu HJ, Lambert PM, Qian M, Zorumski CF, Covey DF, Mennerick S. - Neuropharmacology. 2021 Feb 1;183:108358. doi: 10.1016/j.neuropharm.2020.108358.

Circulating miRNAs in diabetic retinopathy patients: Prognostic markers or pharmacological targets?

Trotta MC, Gesualdo C, **Platania CBM**, De Robertis D, Giordano M, Simonelli F, D'Amico M, **Drago F**, **Bucolo C**, Rossi S. - Biochem Pharmacol. 2021 Apr;186:114473. doi: 10.1016/j.bcp.2021.114473.

SIRT1-Dependent Upregulation of BDNF in Human Microglia Challenged with Aβ: An Early but Transient Response Rescued by Melatonin.

Caruso GI, Spampinato SF, Costantino G, Merlo S, **Sortino MA**. - Biomedicines. 2021 Apr 24;9(5):466. doi: 10.3390/biomedicines9050466.

The epistatic interaction between the dopamine D3 receptor and dysbindin-1 modulates higher-order cognitive functions in mice and humans.

Leggio GM, **Torrisi A**, Mastrogiacomo R, Mauro D, **Chisari M**, Devroye C, Scheggia D, Nigro M, Geraci F, Pintori N, Giurdanella G, Costa L, **Bucolo C**, Ferretti V, **Sortino MA**, Ciranna L, De Luca MA, Mereu M, Managò F, Salomone S, **Drago F** & Papaleo F. - Mol Psychiatry. 2021 Apr;26(4):1272-1285. doi: 10.1038/s41380-019-0511-4.

Beneficial Effects of Choline Alphoscerate on Amyloid-β Neurotoxicity in an In vitro Model of Alzheimer's Disease.

Burgaletto C, **Di Benedetto G**, Munafò A, **Bernardini R**, **Cantarella G**. - Curr Alzheimer Res. 2021;18(4):298-309. doi: 10.2174/1567205018666210608093658.

1α,25-dihydroxyvitamin D3 protects retinal ganglion cells in glaucomatous mice.

Lazzara F, Amato R, **Platania CBM**, Conti F, Chou TH, Porciatti V, **Drago F**, **Bucolo C**. - J Neuroinflammation. 2021 Sep 16;18(1):206. doi: 10.1186/s12974-021-02263-3.

Targeting the miRNA-155/TNFSF10 network restrains inflammatory response in the retina in a mouse model of Alzheimer's disease.

Burgaletto C, **Platania CBM**, **Di Benedetto G**, Munafò A, Giurdanella G, Federico C, Caltabiano R, Saccone S, Conti F, **Bernardini R**, **Bucolo C**, **Cantarella G**. - Cell Death Dis. 2021 Oct 5;12(10):905. doi: 10.1038/s41419-021-04165-x.

PharmacoSTORM nanoscale pharmacology reveals cariprazine binding on Islands of Calleja granule cells.

Prokop S, Ábrányi-Balogh P, Barti B, Vámosi M, Zöldi M, Barna L, Urbán GM, Tóth AD, Dudok B, Egyed A, Deng H, **Leggio GM**, Hunyady L, van der Stelt M, Keserű GM, Katona I. - Nat Commun. 2021 Nov 11;12(1):6505. doi: 10.1038/s41467-021-26757-z.

Venetoclax in Relapsed/Refractory Acute Myeloid Leukemia: Are Supporting Evidences Enough?

Brancati S, Gozzo L, **Romano GL**, Vetro C, Dulcamare I, Maugeri C, Parisi M, Longo L, Vitale DC, Di Raimondo F, **Drago F**. - Cancers (Basel). 2021 Dec 21;14(1):22. doi: 10.3390/cancers14010022.

Section of Pharmacology

Caffeine Protects Against Retinal Inflammation.

Conti F, Lazzara F, Romano GL, Platania CBM, Drago F, Bucolo C. - Front Pharmacol. 2022 Jan 6;12:824885. doi: 10.3389/fphar.2021.824885.

Repurposing Pomalidomide as a Neuroprotective Drug: Efficacy in an Alpha-Synuclein-Based Model of Parkinson's Disease.

Palmas MF, Ena A, Burgaletto C, Casu MA, Cantarella G, Carboni E, Etzi M, De Simone A, Fusco G, Cardia MC, Lai F, Picci L, Tweedie D, Scerba MT, Coroneo V, Bernardini R, Greig NH, Pisanu A, Carta AR. - Neurotherapeutics. 2022 Jan;19(1):305-324. doi: 10.1007/s13311-022-01182-2.

Access to Innovative Neurological Drugs in Europe: Alignment of Health Technology Assessments Among Three European Countries.

Gozzo L, Romano GL, Brancati S, Cicciù M, Fiorillo L, Longo L, Vitale DC, Drago F. - Front Pharmacol. 2022 Feb 4;12:823199. doi: 10.3389/fphar.2021.823199.

Dysbindin-1A modulation of astrocytic dopamine and basal ganglia dependent behaviors relevant to schizophrenia.

Mastrogiacomo R, Trigilio G, Devroye C, Dautan D, Ferretti V, Losi G, Caffino L, Orso G, Marotta R, Maltese F, Vitali E, Piras G, Forgiarini A, Pacinelli G, Lia A, Rothmond DA, Waddington JL, Drago F, Fumagalli F, Luca MA, Leggio GM, Carmignoto G, Weickert CS, Managò F, Papaleo F. - Mol Psychiatry. 2022 Oct;27(10):4201-4217. doi: 10.1038/s41380-022-01683-8.

Nociceptin/orphanin FQ opioid receptor (NOP) selective ligand MCOPPB links anxiolytic and senolytic effects.

Raffaele M, Kovacovicova K, Biagini T, Lo Re O, Frohlich J, Giallongo S, Nhan JD, Giannone AG, Cabibi D, Ivanov M, Tonchev AB, Mistrik M, Lacey M, Dzubak P, Gurska S, Hajduch M, Bartek J, Mazza T, Micale V, Curran SP, Vinciguerra M. - Geroscience. 2022 Feb;44(1):463-483. doi: 10.1007/s11357-021-00487-y.

Intranasal Administration of a TRAIL Neutralizing Monoclonal Antibody Adsorbed in PLGA Nanoparticles and NLC Nanosystems: An In Vivo Study on a Mouse Model of Alzheimer's Disease.

Musumeci T, Di Benedetto G, Carbone C, Bonaccorso A, Amato G, Lo Faro MJ, Burgaletto C, Puglisi G, Bernardini R, Cantarella G. - Biomedicines. 2022 Apr 23;10(5):985. doi: 10.3390/biomedicines10050985.

Polyphenols and neuroprotection: Therapeutic implications for cognitive decline.

Caruso G, Torrisi SA, Mogavero MP, Currenti W, Castellano S, Godos J, Ferri R, Galvano F, Leggio GM, Grosso G, Caraci F. - Pharmacol Ther. 2022 Apr;232:108013. doi: 10.1016/j.pharmthera.2021.108013.

The P2X7 receptor as a new pharmacological target for retinal diseases.

Platania CBM, Drago F, Bucolo C. - Biochem Pharmacol. 2022 Apr;198:114942. doi: 10.1016/j.bcp.2022.114942.

Microglial polarization differentially affects neuronal vulnerability to the β -amyloid protein: Modulation by melatonin.

Merlo S, Caruso GI, Bonfilì L, Spampinato SF, Costantino G, Eleuteri AM, Sortino MA. - Biochemical Pharmacology. 2022 Aug;202:115151. doi: 10.1016/j.bcp.2022.115151.

Role of Microglia and Astrocytes in Alzheimer's Disease: From Neuroinflammation to Ca²⁺ Homeostasis Dysregulation.

Di Benedetto G, Burgaletto C, Bellanca CM, Munafò A, Bernardini R, Cantarella G. - Cells. 2022 Sep 1;11(17):2728. doi: 10.3390/cells11172728.

TRAIL-R Deficient Mice Are Protected from Neurotoxic Effects of Amyloid- β

Di Benedetto G, Burgaletto C, Serapide MF, Caltabiano R, Munafò A, Bellanca CM, Di Mauro R, Bernardini R, Cantarella G. - Int J Mol Sci. 2022 Oct 1;23(19):11625. doi: 10.3390/ijms231911625.

Decreased Astrocytic CCL2 Accounts for BAF-312 Effect on PBMCs Transendothelial Migration Through a Blood Brain Barrier in Vitro Model.

Spampinato SF, Merlo S, Costantino G, Sano Y, Kanda T, Sortino MA. - J Neuroimmune Pharmacol. 2022 Dec;17(3-4):427-436. doi: 10.1007/s11481-021-10016-5.

Gut microbiota alterations promote traumatic stress susceptibility associated with p-cresol-induced dopaminergic dysfunctions.

Laudani S, Torrisi SA, Alboni S, Bastiaanssen TFS, Benatti C, Rivi V, Moloney RD, Fuochi V, Furneri PM, Drago F, Salomone S, Tascetta F, Cryan JF, Leggio GM. - Brain Behav Immun. 2023 Jan;107:385-396. doi: 10.1016/j.bbi.2022.11.004.

Purinergic ionotropic P2X7 and metabotropic glutamate mGlu 5 receptors crosstalk influences proinflammatory conditions in microglia.

Chisari M, Barraco M, Bucolo C, Ciranna L, Sortino MA. - Eur J Pharmacol. 2023 Jan 5;938:175389. doi: 10.1016/j.ejphar.2022.175389.

Melatonin or Ramelteon for Delirium Prevention in the Intensive Care Unit: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

Aiello G, Cuocina M, La Via L, Messina S, Attaguile GA, Cantarella G, Sanfilippo F, Bernardini R. - J Clin Med. 2023 Jan 5;12(2):435. doi: 10.3390/jcm12020435.

Topically administered NOX4 inhibitor, GLX7013114, is efficacious in treating the early pathological events of diabetic retinopathy.

Dionysopoulou S, Wikstrom P, Bucolo C, Romano GL, Micale V, Svensson R, Spyridakos D, Mastrodimou N, Georgakis S, Verginis P, Walum E, Thermos K. - Diabetes. 2023 Feb 23;db220515. doi: 10.2337/db22-0515.

Are the epigenetic changes predictive of therapeutic efficacy for psychiatric disorders? A translational approach towards novel drug targets.

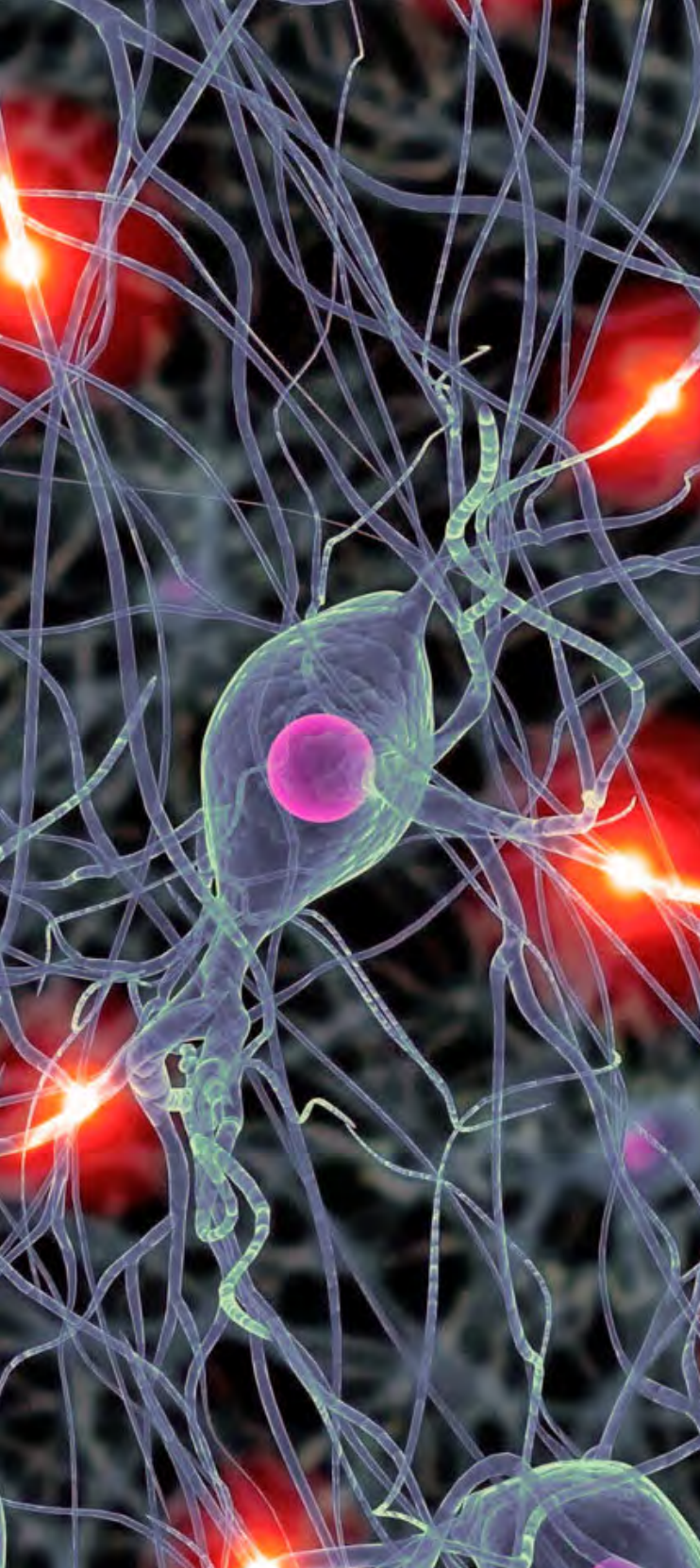
Micale V, Di Bartolomeo M, Di Martino S, Stark T, Dell'Osso B, Drago F, D'Addario C. - Pharmacol Ther. 2023; 241:108279. doi: 10.1016/j.pharmthera.2022.108279.

Corneal wound healing and nerve regeneration by novel ophthalmic formulations based on cross-linked sodium hyaluronate, taurine, vitamin B6, and vitamin B12.

Bucolo C, Maugeri G, Giunta S, D'Agata V, Drago F, Romano GL. - Front Pharmacol. 2023 Feb 2;14:1109291. doi: 10.3389/fphar.2023.1109291.

Mitochondrial cannabinoid receptors gate corticosterone impact on novel object recognition.

Skupio U, Welte J, Serrat R, Eraso-Pichot A, Julio-Kalajzić F, Gisquet D, Cannich A, Delcasso S, Matias I, Fundazuri UB, Pouvreau S, Pagano Zottola AC, Lavanço G, Drago F, Ruiz de Azua I, Lutz B, Bellocchio L, Busquets-Garcia A, Chaouloff F, Marsicano G. - Neuron. 2023 Apr 24;S0896-6273(23)00263-5.



Section of Physiology

Faculty members



Rosario GIUFFRIDA
Full Professor
Section Coordinator



Daniela PUZZO
Full Professor



Venera CARDILE
Associate Professor



Lucia CIRANNA
Associate Professor



Rosario GULINO
Associate Professor



Agostino PALMERI
Associate Professor



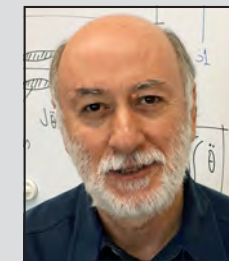
Rosalba PARENTI
Associate Professor



Antonella RUSSO
Associate Professor



Agata ZAPPALÀ
Associate Professor



Antonino CASABONA
Assistant Professor



Debora LO FURNO
Assistant Professor



Maria Stella VALLE
Assistant Professor



Nunzio VICARIO
Assistant Professor

Section of Physiology

RESEARCH LINES

Biotechnology

- Nanoparticles
- Biomaterials transplantation
- 3D-printing
- Virtual reality for health

Cell physiology

- Signal transduction pathways in cell proliferation, differentiation, and apoptosis

Human movement

- Postural motor learning & adaptation
- Physiology of human movement

Neuroscience

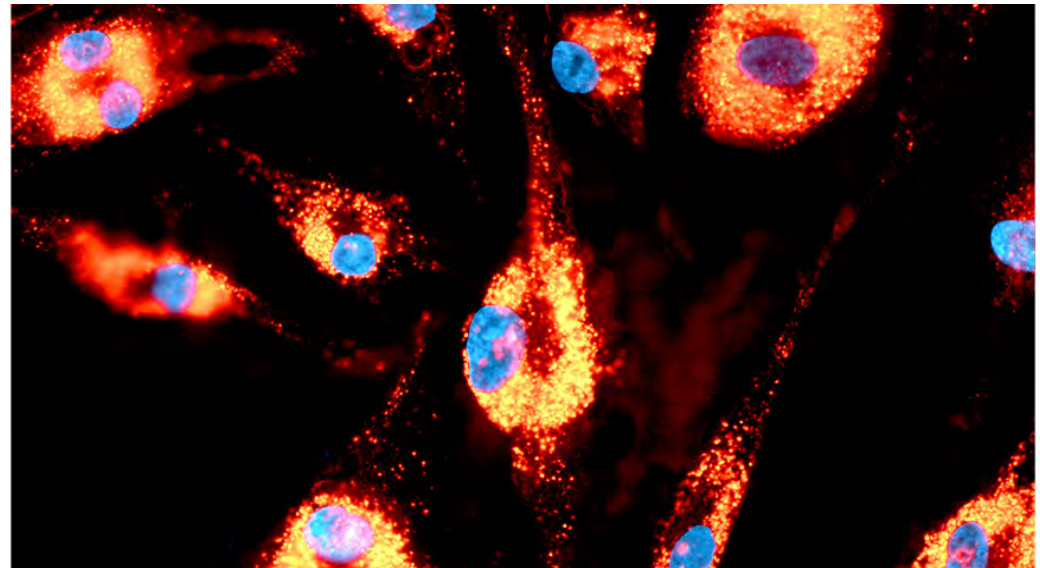
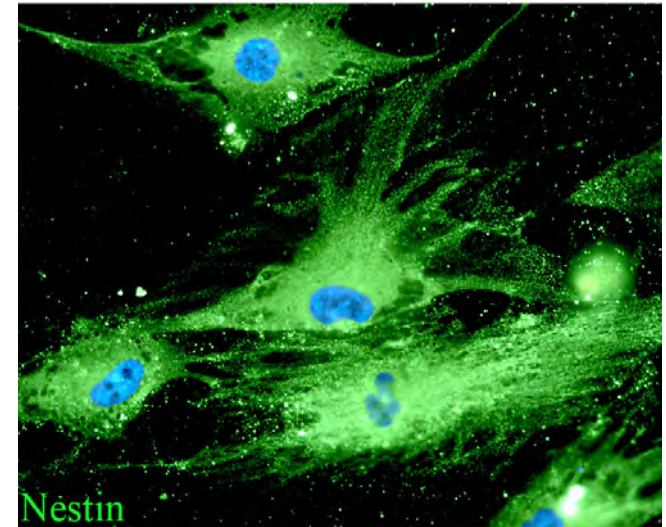
- Neuroprotection
- Neuroinflammation
- Neurodegeneration
- Gap junctions
- Synaptic plasticity
- Learning & Memory
- Aging
- Food intake control

Pathophysiology

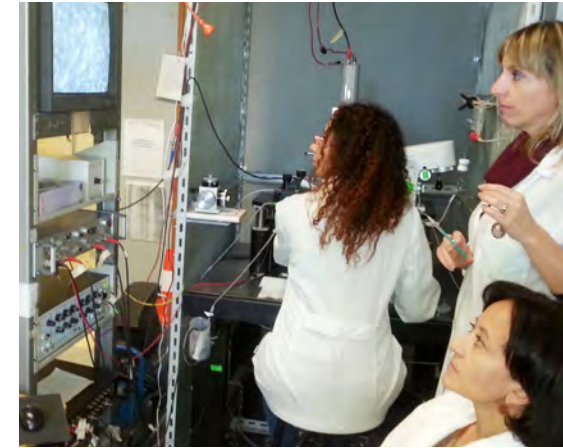
- Alzheimer's and Parkinson's disease
- Demyelination
- Krabbe leukodystrophy
- Fragile X syndrome
- Cancer
- Pompe disease

Stem cells & Regeneration

- Mesenchymal stem cells differentiation
- Osteochondral regeneration



Section of Physiology



INTERNATIONAL COLLABORATIONS

- **O. Arancio**, Columbia University, New York, USA
- **B. Bardoni**, Université Côte d'Azur, France
- **J.D. Bernstock**, Harvard University, USA
- **M. Bertolato**, University of Southern California, Los Angeles, USA
- **A. Frick**, University of Bordeaux, France
- **G. Hess**, Jagiellonian University, Poland
- **A. Madrid**, Universidad de Playa Ancha, Chile
- **A. Manef**, University of Carthage, Tunisia
- **L. Peruzzotti-Jametti**, Cambridge University, UK
- **M. Piovano**, University Tecnica Federico Santa Maria, Chile
- **J. Prickaerts**, Maastricht University, The Netherlands
- **R. Schlichter**, University of Strasbourg, France
- **S. Valable**, University of Caen, France
- **R. Zorec**, University of Ljubljana, Slovenia



University of Ljubljana



HARVARD
UNIVERSITY

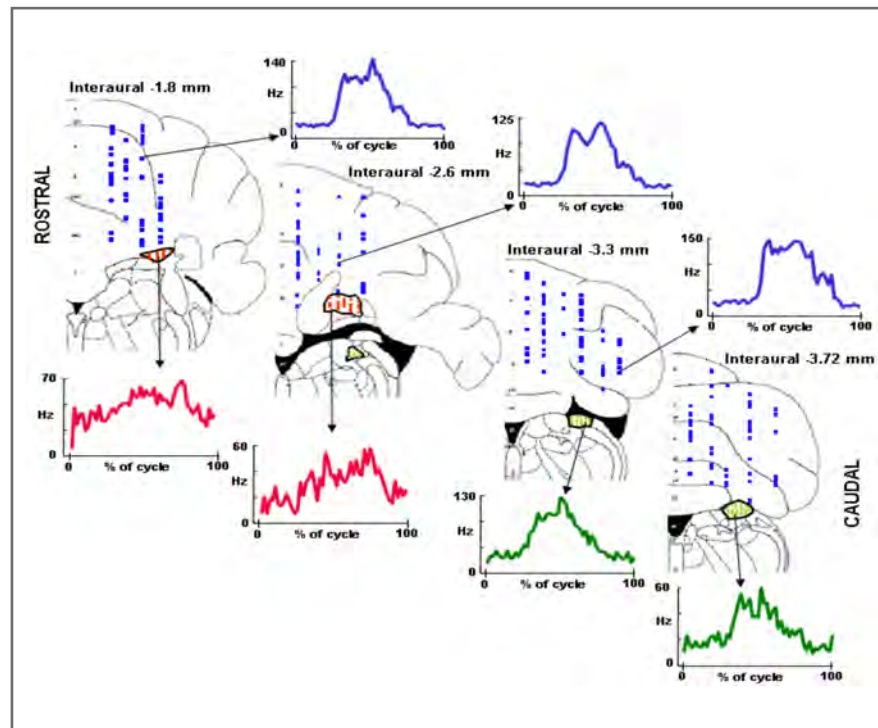
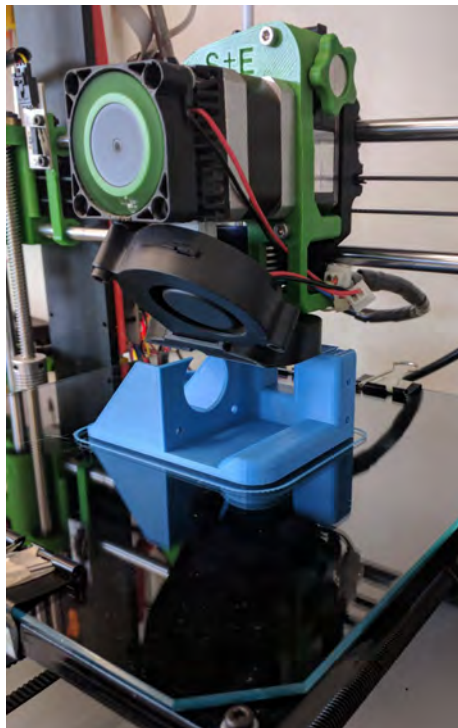
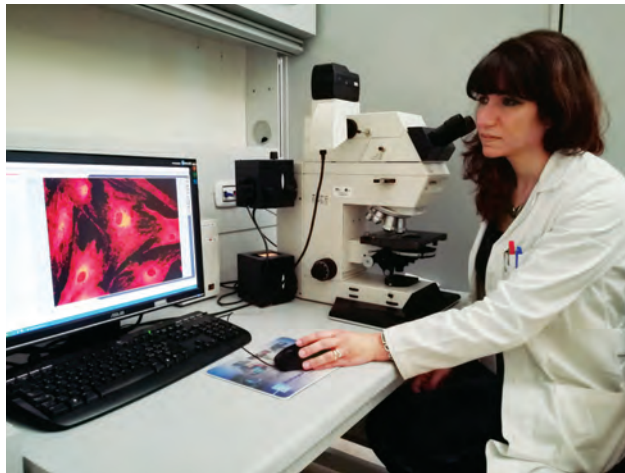


JAGIELLONIAN UNIVERSITY
IN KRAKOW

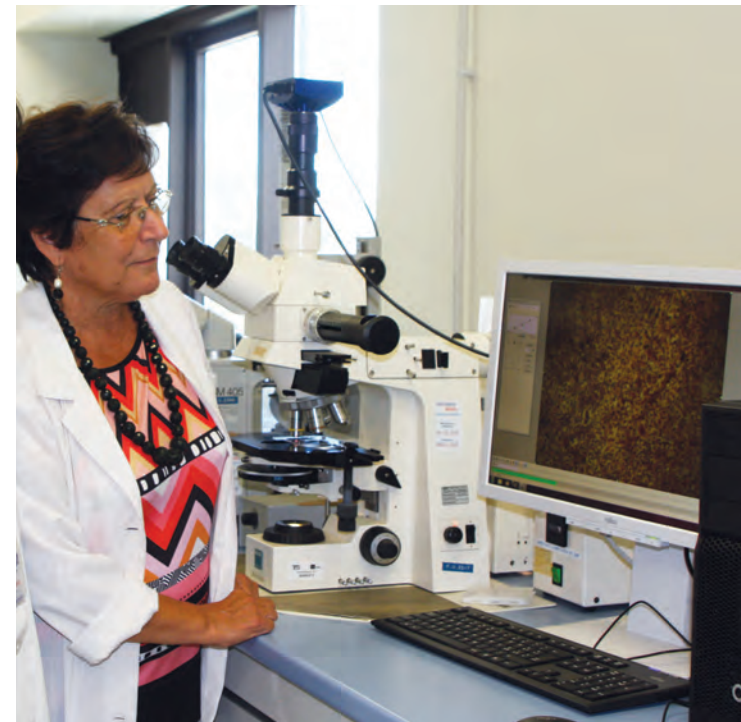
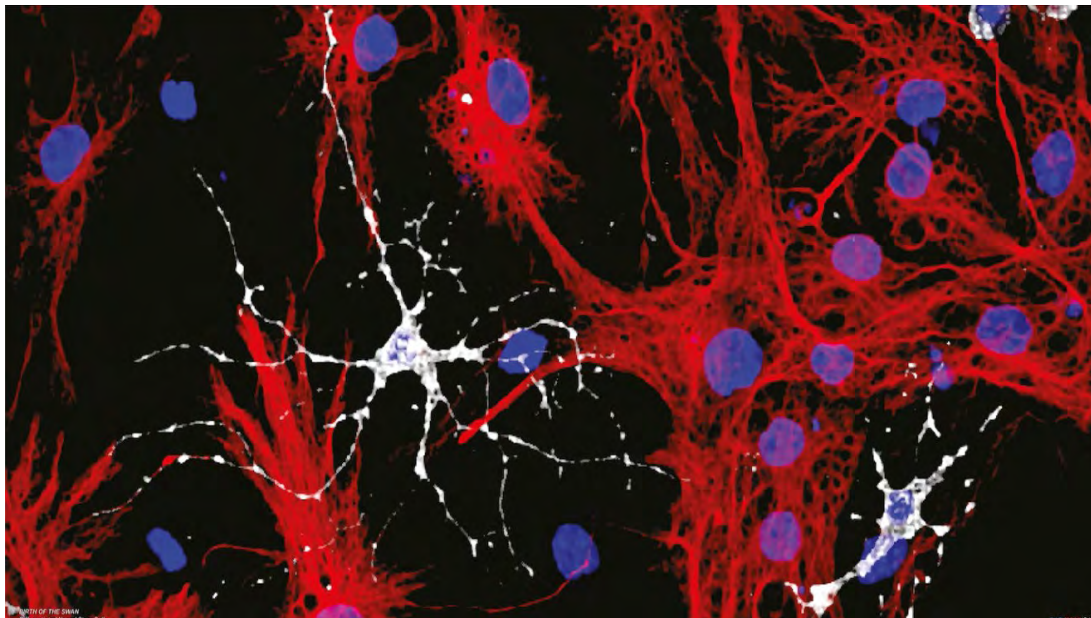
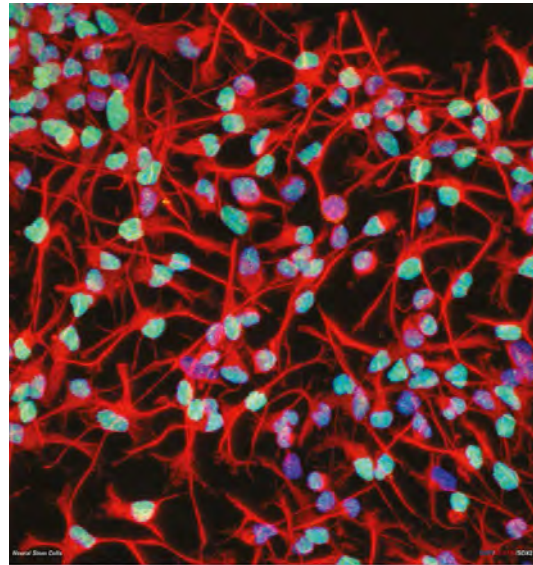
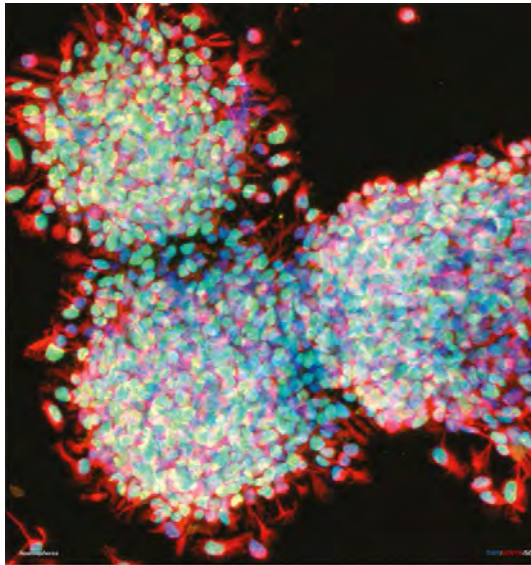


UNIVERSITÉ DE STRASBOURG

Section of Physiology



Section of Physiology



Section of Physiology

FUNDING AGENCIES



- Lucia Ciranna 2022 “Neurons and astrocytes from induced pluripotent stem cells derived from Fragile X Syndrome patients: a human model to validate animal studies and develop new patient- targeted treatments”. Bando Chance 2022, Università di Catania.
- Lucia Ciranna 2018-2021: Coordinatore scientifico e Tutor Accademico del progetto di Dottorato di Ricerca in Biotecnologie della Dott.ssa Alessandra Tempio, XXXIV ciclo, Dottorato innovativo con caratterizzazione industriale codice n. DOT1708221, tema della ricerca: “Recettori per la serotonina quali nuovi target farmacologici per la Sindrome del Cromosoma X Fragile”; finanziamento MIUR, bando PON Ricerca e Innovazione 2014-2020.
- Rosalba Parenti 2021: FSC 2014/2020, Patto di sviluppo per la Regione Siciliana. Titolo: BCT – Breast Cancer Therapy. Principal Investigator UNICT.
- Rosalba Parenti 2020: PON Research and Innovation 2014-2020. Title: “BONE++”. N.: ARS01_00693. Capofila: Distretto Tecnologico Sicilia Micro e Nano Sistemi. Principal Investigator for UNICT.
- Rosalba Parenti 2020: PO FESR Sicilia 2014-2020. Azione 1.1.5. Title: DiOncoGen. Decr. Finanz. Prot. 74305 del 05/12/2019., notifica D.D.G. n. 3313 del 05/11/2019. Capofila: Istituto Oncologico del Mediterraneo S.p.a. Principal Investigator for Biometec.
- Rosalba Parenti 2020: PON “R&C” 2007-2013 – Title: Drug delivery: vehicles for sustainable innovation. N.: PON03PE_00216_1. Principal Investigator for Biometec.
- Rosalba Parenti 2020: PO FESR Sicilia 2014-2020. Azione 1.1.5. Title: LiverSmartDrug - N°: 087219090463. Capofila: Distretto Tecnologico Sicilia Micro e Nano Sistemi. Ruolo: Principal Investigator for Biometec.
- Rosalba Parenti 2020: Piano di Incentivi per la ricerca di Ateneo 2020–2022, Linea di Intervento 2, “MD-RESETT-GLIO”.
- Daniela Puzzo 2020: PO-FESR 2014-2020. Azione 1.1.5. Settore: Smart cities and communities. N.: 08CT4669990220. Capofila: Klain robotics srl. Principal Investigator for BIOMETEC; Principal Investigator for UNICT.
- Daniela Puzzo 2020: Piano di Incentivi per la ricerca di Ateneo 2020-2022, Linea di Intervento 2. “VESPA 2.0 (Virtual Environment for a Superior neuro-PsychiAtry)”. Principal Investigator for BIOMETEC
- Daniela Puzzo 2021: Ministero Italiano dell’Università e della Ricerca. PRIN 2020. Title: Interaction between cholinergic and glutamatergic synaptic transmission at tripartite synapse in the pathophysiology of Alzheimer’s disease. Principal Investigator for UNICT.
- Rosario Gulino 2022 - AriSLA 2022. Title: “SHHield – Targeting smoothened to promote neuroprotection in ALS”. Role in the project: Principal Investigator.

Section of Physiology

Research paper selection of Biometec (2020-2023)

Age-Related Changes in Mobility Evaluated by the Timed Up and Go Test Instrumented through a Single Sensor.

Mangano GRA, Valle MS, Casabona A, Vagnini A, Cioni M. *Sensors (Basel)*. 2020 Jan 28;20(3):719.

Olfactory Ensheathing Cells express both Ghrelin and Ghrelin Receptor in vitro: a new hypothesis in favor of a neurotrophic effect.

Russo C, Patanè M, Vicario N, Di Bella V, Cosentini I, Barresi V, Gulino R, Pellitteri R, Russo A, Stanzani S. *Neuropeptides*. 2020 Feb;79:101997.

Privileged scaffold-based design to identify a novel drug-like 5-HT7 receptor-preferring agonist to target Fragile X syndrome.

Lacivita E, Niso M, Stama ML, Arzuaga A, Altamura C, Costa L, Desaphy JF, Ragozzino ME, Ciranna L, Leopoldo M. *Eur J Med Chem*. 2020 Aug 1;199:112395.

Tau is not necessary for amyloid- β -induced synaptic and memory impairments.

Puzzo D, Argyrousi EK, Staniszewski A, Zhang H, Calcagno E, Zuccarello E, Acquarone E, Fa' M, Li Puma DD, Grassi C, D'Adamio L, Kanaan NM, Fraser PE, Arancio O. *J Clin Invest*. 2020 Sep 1;130(9):4831-4844.

Intercellular communication and ion channels in neuropathic pain chronicization.

Vicario N, Turnaturi R, Spitale FM, Torrisi F, Zappalà A, Gulino R, Pasquinucci L, Chiechio S, Parenti C, Parenti R. *Inflamm Res*. 2020 Sep;69(9):841-850.

Oregano (*Origanum vulgare* L.) essential oil provides anti-inflammatory activity and facilitates wound healing in a human keratinocytes cell model.

Avola R, Granata G, Geraci C, Napoli E, Graziano ACE, Cardile V. *Food Chem Toxicol*. 2020 Oct;144:111586.

Pericyte-like differentiation of human adipose-derived mesenchymal stem cells: An in vitro study.

Mannino G, Gennuso F, Giuridanella G, Conti F, Drago F, Salomone S, Lo Furno D, Bucolo C, Giuffrida R. *World J Stem Cells*. 2020 Oct 26;12(10):1152-1170.

Moscaticolin, a bibenzyl derivative from the orchid *Dendrobium loddigesii*, induces apoptosis in melanoma cells.

Cardile V, Avola R, Graziano ACE, Russo A. *Chem Biol Interact*. 2020 May 25;323:109075.

Executive Functions During Submaximal Exercises in Male Athletes: Role of Blood Lactate.

Coco M, Buscemi A, Cavallari P, Massimino S, Rinella S, Tortorici MM, Maci T, Perciavalle V, Tusak M, Di Corrado D, Perciavalle V, Zappalà A. *Front Psychol*. 2020 Oct 30;11:537922.

Neuroprotective effects of *Rosmarinus officinalis* L. extract in oxygen glucose deprivation (OGD)-injured human neural-like cells.

Zappalà A, Vicario N, Calabrese G, Turnaturi R, Pasquinucci L, Montenegro L, Spadaro A, Parenti R, Parenti C. *Nat Prod Res*. 2021 Feb;35(4):669-675.

Effects of High Glucose Concentration on Pericyte-Like Differentiated Human Adipose-Derived Mesenchymal Stem Cells.

Mannino G, Longo A, Gennuso F, Anfuso CD, Lupo G, Giuridanella G, Giuffrida R, Lo Furno D. *Int J Mol Sci*. 2021 Apr 27;22(9):4604.

Serotonin 5-HT7 receptors require cyclin-dependent kinase 5 to rescue hippocampal synaptic plasticity in a mouse model of Fragile X Syndrome.

Costa L, Tempio A, Lacivita E, Leopoldo M, Ciranna L. *Eur J Neurosci*. 2021 May 5;54(1):4124-32.

Adaption of Lung Fibroblasts to Fluoro-Edenite Fibers: Evaluation of Molecular and Physiological Dynamics.

Graziano ACE, Ledda C, Loreto C, Cardile V. *Cell Physiol Biochem*. 2021 Jun 23;55(3):327-343.

Clobetasol promotes neuromuscular plasticity in mice after motoneuronal loss via sonic hedgehog signaling, immunomodulation and metabolic rebalancing.

Vicario N, Spitale FM, Tibullo D, Giallongo C, Amorini AM, Scandura G, Spoto G, Saab MW, D'Aprile S, Alberghina C, Mangione R, Bernstock JD, Botta C, Gulisano M, Buratti E, Leanza G, Zorec R, Vecchio M, Di Rosa M, Li Volti G, Lazzarino G, Parenti R, Gulino R. *Cell Death Dis*. 2021 Jun 16;12(7):625.

Potential therapeutic applications of mesenchymal stem cells for the treatment of eye diseases.

Mannino G, Russo C, Longo A, Anfuso CD, Lupo G, Lo Furno D, Giuffrida R, Giuridanella G. *World J Stem Cells*. 2021 Jun 26;13(6):632-644.

Ghrelin peptide improves glial conditioned medium effects on neuronal differentiation of human adipose mesenchymal stem cells.

Russo C, Mannino G, Patanè M, Parrinello NL, Pellitteri R, Stanzani S, Giuffrida R, Lo Furno D, Russo A. *Histochem Cell Biol*. 2021 Jul;156(1):35-46.

Connexin 43 and Sonic Hedgehog Pathway Interplay in Glioblastoma Cell Proliferation and Migration.

Torrisi F, Alberghina C, Lo Furno D, Zappalà A, Valable S, Li Volti G, Tibullo D, Vicario N, Parenti R. *Biology (Basel)*. 2021 Aug 12;10(8):767.

Is the Power Spectrum of Electromyography Signal a Feasible Tool to Estimate Muscle Fiber Composition in Patients with COPD?

Casabona A, Valle MS, Laudani L, Crimi C, Russo C, Malaguarnera L, Crimi N, Cioni M. *J Clin Med*. 2021 Aug 25;10(17):3815.

Section of Physiology

Impact of chronic obstructive pulmonary disease on passive viscoelastic components of the musculoarticular system.

Valle MS, Casabona A, Di Fazio E, Crimi C, Russo C, Malaguarnera L, Crimi N, Cioni M. Sci Rep. 2021 Sep 10;11(1):18077.

Novel Therapeutic Potential for Pituitary Adenylate Cyclase-Activating Polypeptide (PACAP), Vasoactive Intestinal Peptide (VIP) and Related Peptides in Cognition Deficits.

Ciranna L., Reglodi D., Chow B. K. and Vaudry D. (2021). Front. Cell. Neurosci., 13 September 2021.

Genetic deletion of $\alpha 7$ nicotinic acetylcholine receptors induces an age-dependent Alzheimer's disease-like pathology.

Tropea MR, Li Puma DD, Melone M, Gulisano W, Arancio O, Grassi C, Conti F, Puzzo D. Prog Neurobiol. 2021 Nov;206:102154.

ARPE-19 conditioned medium promotes neural differentiation of adipose-derived mesenchymal stem cells.

Mannino G, Cristaldi M, Giurdanella G, Perrotta RE, Lo Furno D, Giuffrida R, Rusciano D. World J Stem Cells. 2021 Nov 26;13(11):1783-1796.

Nitric oxide/cGMP/CREB pathway and amyloid-beta crosstalk: From physiology to Alzheimer's disease.

Tropea MR, Gulisano W, Vacanti V, Arancio O, Puzzo D, Palmeri A. Free Radic Biol Med. 2022 Nov 20;193(Pt 2):657-668.

The Role of Epigenetics in Neuroinflammatory-Driven Diseases.

Giallongo S, Longhitano L, Denaro S, D'Aprile S, Torrisi F, La Spina E, Giallongo C, Mannino G, Lo Furno D, Zappalà A, Giuffrida R, Parenti R, Li Volti G, Tibullo D, Vicario N. Int J Mol Sci. 2022 Dec 2;23(23):15218.

Neurotrophic and immunomodulatory effects of olfactory ensheathing cells as a strategy for neuroprotection and regeneration.

Denaro S, D'Aprile S, Alberghina C, Pavone AM, Torrisi F, Giallongo S, Longhitano L, Mannino G, Lo Furno D, Zappalà A, Giuffrida R, Tibullo D, Li Volti G, Vicario N, Parenti R. Front Immunol. 2022 Dec 19;13:1098212.

A Meta-Analysis Study of SOD1-Mutant Mouse Models of ALS to Analyse the Determinants of Disease Onset and Progression.

Ciuro M, Sangiorgio M, Leanza G, Gulino R. Int J Mol Sci. 2022 Dec 22;24(1):216.

Adult stem cell niches for tissue homeostasis.

Mannino G, Russo C, Maugeri G, Musumeci G, Vicario N, Tibullo D, Giuffrida R, Parenti R, Lo Furno D. J Cell Physiol. 2022 Jan;237(1):239-257.

Mu and Delta Opioid Receptor Targeting Reduces Connexin 43-Based Heterocellular Coupling during Neuropathic Pain.

Vicario N, Denaro S, Turnaturi R, Longhitano L, Spitalo FM, Spoto S, Marrazzo A, Zappalà A, Tibullo D, Li Volti G, Chiechio S, Pasquinucci L, Parenti R, Parenti C. Int J Mol Sci. 2022 May 24;23(11):5864.

Redox modulation of stress resilience by *Crocus sativus* L. for potential neuroprotective and anti-neuroinflammatory applications in brain disorders: From molecular basis to therapy.

Scuto M, Modafferi S, Rampulla F, Zimbone V, Tomasello M, Spano' S, Ontario ML, Palmeri A, Trovato Salinaro A, Siracusa R, Di Paola R, Cuzzocrea S, Calabrese EJ, Wenzel U, Calabrese V. Mech Ageing Dev. 2022 Jul;205:111686.

GJA1/CX43 High Expression Levels in the Cervical Spinal Cord of ALS Patients Correlate to Microglia-Mediated Neuroinflammatory Profile.

Vicario N, Castrogiovanni P, Imbesi R, Giallongo S, Mannino G, Lo Furno DL, Giuffrida R, Zappalà A, Li Volti G, Tibullo D, Di Rosa M, Parenti R. Biomedicines. 2022 Sep 10;10(9):2246

Application of 3D Printing Technology to Produce Hippocampal Customized Guide Cannulas.

Tropea MR, Torrisi A, Vacanti V, Pizzone D, Puzzo D, Gulisano W. eNeuro. 2022 Sep 28;9(5):ENEURO.0099-22.2022.

The Interplay between Ghrelin and Microglia in Neuroinflammation: Implications for Obesity and Neurodegenerative Diseases.

Russo C, Valle MS, Russo A, Malaguarnera L. Int J Mol Sci. 2022 Nov 3;23(21):13432.

Synaptic Dysfunction and Plasticity in Amyotrophic Lateral Sclerosis.

Gulino R. Int J Mol Sci. 2023 Feb 27;24(5):4613.

Balance impairment in cerebrotendinous xanthomatosis: Ankle strategy deficit. A case study.

Cioni M, Casabona A, Sapuppo A, Messina G, Fiumara A, Valle MS. Clin Biomech (Bristol, Avon). 2023 Feb;102:105896.

Chitinase Signature in the Plasticity of Neurodegenerative Diseases.

Russo C, Valle MS, Casabona A, Malaguarnera L. Int J Mol Sci. 2023 Mar 27;24(7):6301.

Proton boron capture therapy (PBCT) induces cell death and mitophagy in a heterotopic glioblastoma model.

Cammarata FP, Torrisi F, Vicario N, Bravatà V, Stefano A, Salvatorelli L, D'Aprile S, Giustetto P, Forte GI, Minafra L, Calvaruso M, Richiusa S, Cirrone GAP, Petringa G, Broggi G, Cosentino S, Scopelliti F, Magro G, Porro D, Libra M, Ippolito M, Russo G, Parenti R, Cuttone G. Commun Biol. 2023 Apr 8;6(1):388.

Undergraduate teaching activity

Master degrees:

- Medical Biotechnology
- Sciences and techniques of preventive and adaptive motor activities
- Human Nutrition

Bachelor degrees:

- Biotechnology
- Physiotherapy
- Exercise and Sport Sciences
- Orthoptics and Ophthalmologic Assistance
- Occupational Therapy



Postgraduate Teaching Activity

Residency courses



**Clinical Pharmacology and Toxicology
(non medical students)**

Head: Renato Bernardini



**Clinical Pharmacology and Toxicology
(medical students)**

Head: Giuseppina Cantarella



Clinical Pathology and Biochemistry

Head: Vittorio Calabrese



Microbiology and Virology

Head: Guido Scalia



Physical and Rehabilitative Medicine

Head: Michele Vecchio

First level master degree



**Molecular Imaging and Radiopharmaceuticals:
from Preclinical to Clinical Studies**

Coordinator: Rosalba Parenti



Posturology and Physical Exercise Sciences

Coordinator: Giuseppe Musumeci



Psycho-Neuro-Endocrine-Immunology

Coordinator: Agostino Palmeri



Postgraduate Teaching Activity

Second level master degree

MASTER IN DISCIPLINE REGOLATORIE DEL FARMACO

Università di Catania - Biometec

Il Master ha come obiettivo la crescita di esperti della pratica e di ricerca, nell'ambito e nel campo delle discipline regolatorie del farmaco.

Il Master è riservato a laureati in:

- Medicina e Chirurgia
- Chirurgia
- Medicina
- Chirurgia
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita

Scadenza del bando: **GIOVEDÌ, 15 DICEMBRE 2022**

Il bando completo è scaricabile da sito: <http://www.unict.it>

Drug Regulatory Affairs
Coordinator: **Filippo Drago**



MASTER LA GOVERNANCE DEL TRIAL CLINICO

Università di Catania - Biometec

Il Master ha come obiettivo la crescita di esperti della pratica e di ricerca, nell'ambito e nel campo della governance del trial clinico.

Il Master è riservato a laureati in:

- Medicina e Chirurgia
- Chirurgia
- Medicina
- Chirurgia
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita

Scadenza del bando: **GIOVEDÌ, 15 DICEMBRE 2022**

Il bando completo è scaricabile da sito: <http://www.unict.it>

Clinical Trial Governance
Coordinator: **Renato Bernardini**



MASTER UNIVERSITARIO DI II LIVELLO IN BIOINFORMATICA

Università di Catania - Biometec

Il Master ha come obiettivo la crescita di esperti della pratica e di ricerca, nell'ambito e nel campo della bioinformatica.

Il Master è riservato a laureati in:

- Medicina e Chirurgia
- Chirurgia
- Medicina
- Chirurgia
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita

Scadenza del bando: **GIOVEDÌ, 15 DICEMBRE 2022**

Il bando completo è scaricabile da sito: <https://www.unict.it/bandi-post-laurea/bioinformatic>

Bioinformatics
Coordinator: **Massimo Libra**



MASTER IN WELLNESS, NUTRACEUTICA E MEDICINA ESTETICA

Università di Catania - Biometec

Il Master ha come obiettivo la crescita di esperti della pratica e di ricerca, nell'ambito e nel campo della wellness, nutraceutica e medicina estetica.

Il Master è riservato a laureati in:

- Medicina e Chirurgia
- Chirurgia
- Medicina
- Chirurgia
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita

Scadenza del bando: **GIOVEDÌ, 15 DICEMBRE 2022**

Il bando completo è scaricabile da sito: <http://www.unict.it>

Wellness, Nutraceutic and Aesthetic Medicine
Coordinator: **Filippo Drago**



ANNO ACCADEMICO 2022-2023 MASTER di II livello CURE PALLIATIVE E TERAPIA DEL DOLORE

Università di Catania - Biometec

Il Master ha come obiettivo la crescita di esperti della pratica e di ricerca, nell'ambito e nel campo delle cure palliative e della terapia del dolore.

Il Master è riservato a laureati in:

- Medicina e Chirurgia
- Chirurgia
- Medicina
- Chirurgia
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita
- Scienze della Terra
- Scienze della Vita

Scadenza del bando: **GIOVEDÌ, 15 DICEMBRE 2022**

Il bando completo è scaricabile da sito: <http://www.unict.it/bandi-post-laurea/cure-palliative>

Palliative care and pain management
Coordinator: **Katia Mangano**



PhD Programs

BASIC AND APPLIED BIOMEDICAL SCIENCES

Coordinator: **Stefania Stefani**

Curricula:

Translational Oncology, Immunology and Aging, Experimental Surgery and Anatomy, Molecular Biomedicine and Biotechnology, Molecular Genetics, Microbiology and Virology

Faculty members: 40 - PhD students for year: 4-8

BIOTECHNOLOGY

Coordinator: **Vito De Pinto**

Curricula:

Molecular Biotechnologies, Biomedical and Preclinical Biotechnologies, Pharmaceutical Biotechnologies, Agri-Food Biotechnologies

Faculty members: 29 - PhD students for year: 4-8

NEUROSCIENCE

Coordinator: **Filippo Drago**

Curricula:

Neuropharmacology, Neurophysiology and Cellular and Molecular Neurosciences, Clinical Neurosciences, Pharmaceutical Sciences

Faculty members: 18 - PhD students for year: 4-8

Editorial activity



Conferences



High level educational courses



Research at Biometec

The research objectives of the Department are vast, including the basic analysis of structure and functions of proteins, the study of the pathophysiology of diseases of the central nervous system, investigation on microbial infections, the control of cancer growth. Application of bioinformatics in all the research areas is emerging for an innovative analysis and interpretation of biological data. Translational research concerning health, exercise and disease in humans is also carried out.

Biometec laboratories are fully equipped to guarantee execution of cutting-edge research activities. The facility centers, BRIT and CAPIR, that are located within the biological tower, offer the chance to carry out in vivo animal studies and to exploit the use of highly specialized equipment. The environment encourages collaborations among researchers to promote an interdisciplinary and integrated approach to scientific questions. This is also favored by interactions that are intense, productive and in continuous development, with other scientists and clinicians from other departments and also with external labs on a world-wide basis. The establishment of highly focused research centers, gathering multidisciplinary expertise, allows an extra opportunity to share research objectives among distinct disciplines.

Research at Biometec is supported by funding from several sources. Institutional financial support represents the pillar of research funding, but also private sources greatly contribute to sustain research activities. At present, the availability of large investments with the “Piano Nazionale di Ripresa e Resilienza” (PNRR) program is providing a significant contribution to Biometec research activities with a financial support that recently has allowed also considerable human resource recruitment.



Research Topics



- Bacteriology, Mycology, Parasitology, Virology
- Bioinformatics
- Cancer Research
- Genetics
- Genomics, Transcriptomics, Proteomics
- Immunopharmacology
- Molecular and Cellular Biology
- Motor Learning and Adaptation
- Nanotechnologies and Microtechnologies
- Neurophysiology
- Neuropsychopharmacology
- Nutritional Medicine
- Ocular Pharmacology



Internationalization

Over the past years, the Department has developed several international collaborations involving faculty and students. Through the Erasmus program and the availability of funding from the University of Catania, faculty members can access resources that encourage and support mobility for teaching and/or for research purposes. Collaborative agreements can favor exchange of knowledge and expertise to increase scientific productivity, with high profile publications, and also funding acquisition. These resources are also useful to host scientists from foreign countries to give lectures and seminars or collaborate in research activities in our labs.

Students (of I, II or III level) are supported by the Erasmus program and by the University of Catania fellowships to engage in mobility programs, either for study or traineeship. Several students from different European countries have already spent or are going to visit our University for a short stage of weeks/months for a traineeship in areas related to courses held in the Department (Physical Therapy, Orthoptics, etc.). Research laboratories often host international students from European and non-European countries.

The agreement with Fujan Normal University in Fuzhou allowed the activation of a dedicated class for Chinese students coming from this University who can follow frontal teaching on line and visit the department for practical activities during the last semester. Finally, seminar activities in the Department are intense and students have the opportunity to follow lectures on different topics held by visiting scientists from abroad.

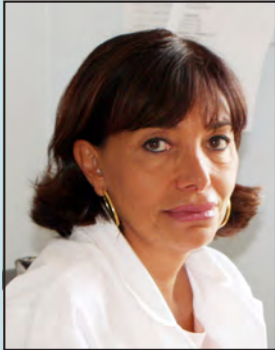


Third Mission

According to the strategic plan of the University of Catania, Third Mission is a fundamental task of the Department of Biomedical and Biotechnological Sciences. Many researchers are engaged in third mission activities mainly aimed at diffusion of knowledge and science outside the academic environment to drive cultural as well as economic development. This is achieved through public engagement in the biomedical area with continuous education courses and transferring of science advancement and new frontiers of biotechnology to the general public, including school age population. In this regard, the Museum of Anatomy, which is already present at Biometec, is being transferred, renovated and improved to be attractive and visited by a larger population of the area (see dedicated section). Biometec has been actively involved in several projects aimed at improving public health also in terms of quality of life and wellness of patients. To this end, agreements and collaborations have been established with private foundations particularly engaged in the promotion of health and support of weak and frail patients. Technology transfer and patent application are highly promoted and a European and a US patent have been recently registered. In addition, the spin-off WE.MITOBIOBETECH S.R.L. was established to design and validate molecules with the potential to contrast mitochondrial dysfunction.



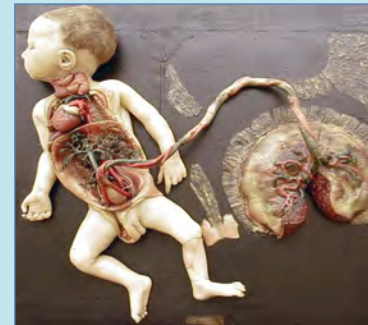
Museum of biology and human anatomy Lorenzo Bianchi



Velia D'Agata
Scientific Director

The museum currently houses the nineteenth-century anatomical tables “**L’Anatomia Universa**” by Paolo Mascagni, the anatomical atlas to be counted among the most monumental works ever published.

The Anatomic tables (1800) are extraordinary for precision and richness of details and represent a body in natural size. We also find anatomical tables in black and white and in color by other authors, different collections of anatomical volumes from 1700 to today, the Prodrôme of the Great Anatomy, second posthumous work by Francesco Antommarchi (1800).



Among these findings, we can include the anatomical human preparations dry dissected, fixed and included in resins according to the technique of Paolo Mascagni, preparations similar to the famous **anatomical machines** exhibited in the Chapel of San Severo in Naples.

These preparations of inestimable historical and scientific value, are also precious as a rare testimony of preparatory technique and dissection. Also, inside the museum area there is also «L’anatome», the virtual dissection table.

Museum of biology and human anatomy Lorenzo Bianchi

The collection also houses the largest collection of **Sicilian skulls** (more than 700 skulls of different ages), 4 skeletons of various ages and sizes, skeletons in anatomical connection, the skeleton of a man who lived 2300 years ago from the Naxos Necropolis, about 1000 disarticulated human bones.

The Collection also houses dry preparations of various organs and apparatuses with resins, mummified anatomical preparations, prepared in fixative, anatomical instrumentation, a collection of antique optical microscopes, scales, a His embryograph and anatomical models in ceramics. Also, you can admire the nineteenth-century anatomical waxes of Giuseppe Astorri.



RESEARCH ACADEMIC TEAM INCLUDES:

Basic scientists with different professional skills in biology, chemistry, biochemistry, genetics, pathology, informatics, and medical doctors comprising surgeons, pathologists and oncologists

TOPICS:

- Cancer etiology and prevention
- Bio-bank
- Tumor microenvironment
- Molecular markers and liquid biopsy
- Computational modeling
- Drug discovery and drug repositioning
- Drug resistance
- Clinical trials

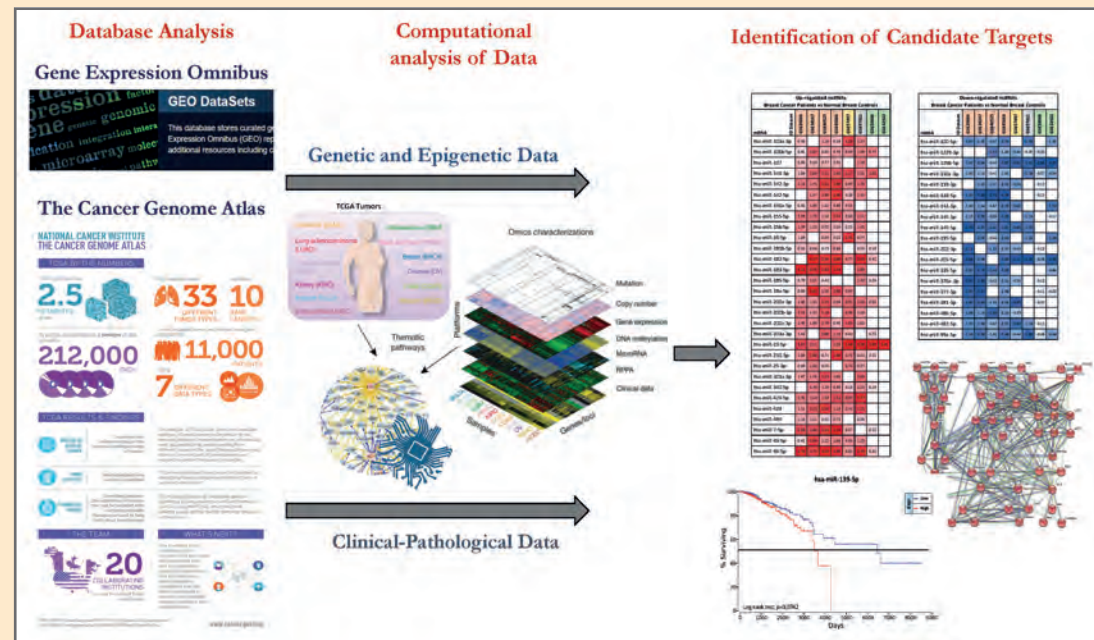


Head: Massimo Libra

Supported by :



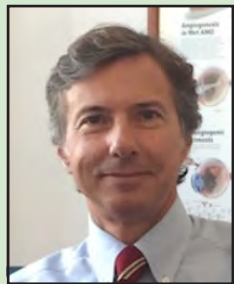
Italian League Against Cancer



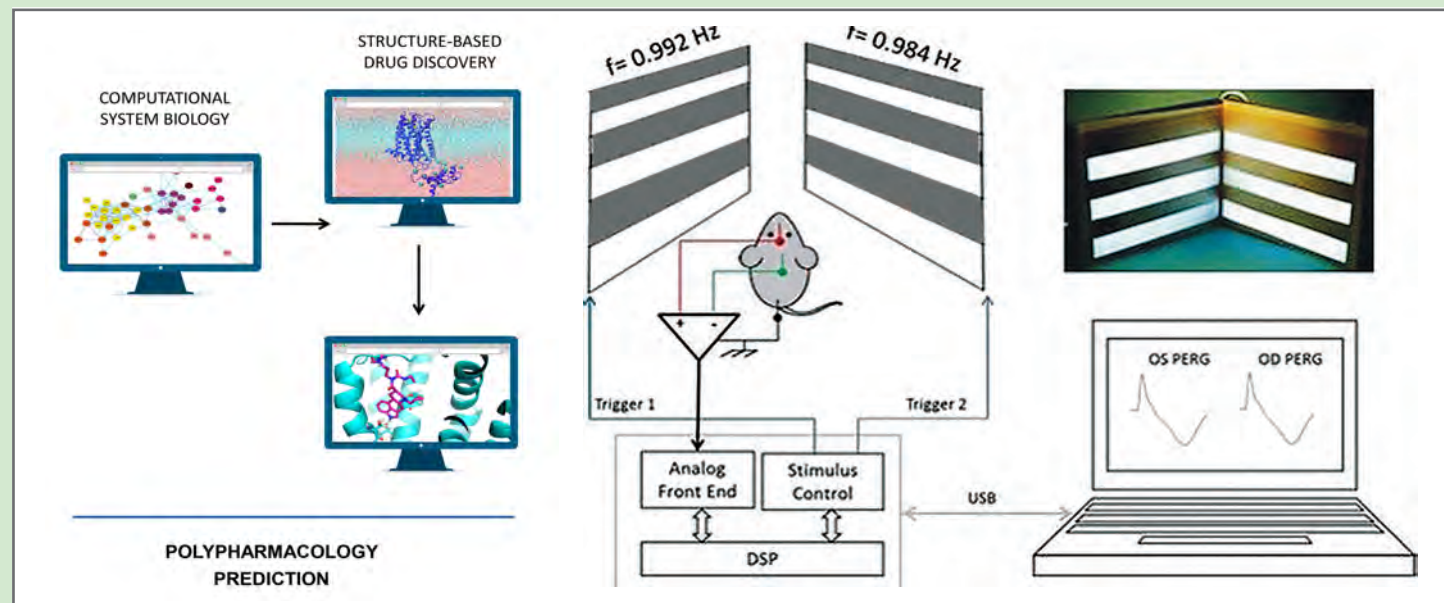
CeRFO - Center for Research in Ocular Pharmacology

Instruments

- Drug design/bioinformatics software stations
- Pharmaceutical technology facility
- HPLC
- PERG
- Indirect ophthalmoscope
- Slit-lamp
- Surgery microscope
- Esthesiometer
- Tono-Lab
- Tono-Pen
- Tissue culture facility



Director: Claudio Bucolo



Center for Research in Health Technology Assessment (HTA) and Regulatory Affairs

The recently established CERD represents an important national and international reference center for HTA research and Drug Regulatory Affairs. CERD will strengthen an already ongoing network among Experts and KOL, aiming to create a solid task force able to develop research projects and attract relative funds.

CERD members have high quality, solid, long experienced background and expertise in Clinical Pharmacology, Regulatory Affairs, HTA and Pharmacoeconomics.

CERD activities are devoted to either research and educational activity. CERD research activities are focused on: a) HTA; b) monitoring of biotechnological drugs; c) monitoring and methodologies of evaluation of innovative drugs; d) monitoring and consulting of off-label drug use; e) methodologies to control pharmaceutical expenditure.

The educational and training activities of the CERD include the participation in the annual National Conference on Drugs Affairs (Conferenza Nazionale sulla Farmaceutica) and the Master Degree in Drug Regulatory Affairs (Discipline Regolatorie del Farmaco) which are active since years at the Department of Biomedical and Biotechnological Sciences, University of Catania. The CERD also publishes a monthly Bulletin (Bollettino del CERD) on the novelties in the field of drug regulatory affairs.



Director: **Filippo Drago**

PUBLICATIONS

Fertility Preservation in Female Pediatric Patients With Cancer: A Clinical and Regulatory Issue.

Brancati S, Gozzo L, Longo L, Vitale DC, Russo G, Drago F. - Front Oncol. 2021

Rituximab in Multiple Sclerosis: Are We Ready for Regulatory Approval?

Brancati S, Gozzo L, Longo L, Vitale DC, Drago F. - Front Immunol. 2021

Editorial: Drug Repurposing for COVID-19 Therapy.

Maldonado R, Drago F. - Front Pharmacol. 2021

New Therapeutic Perspectives in the Treatment of Uveal Melanoma: A Systematic Review.

Toro MD, Gozzo L, Tracia L, Cicciù M, Drago F, Bucolo C, Avitabile T, Rejdak R, Nowomiejska K, Zweifel S, Yousef YA, Nazzari R, Romano GL. - Biomedicines. 2021

Health Technology Assessment of Advanced Therapy Medicinal Products: Comparison Among 3 European Countries.

Gozzo L, Romano GL, Romano F, Brancati S, Longo L, Vitale DC, Drago F. - Front Pharmacol. 2021

Off-Label Use of Venetoclax in Patients With Acute Myeloid Leukemia: Single Center Experience and Data From Pharmacovigilance Database.

Gozzo L, Vetro C, Brancati S, Longo L, Vitale DC, Romano GL, Mauro E, Fiumara PF, Maugeri C, Parisi MS, Dulcamare I, Garibaldi B, Duminuco A, Palumbo GA, Di Raimondo F, Drago F. - Front Pharmacol. 2021

Venetoclax in Relapsed/Refractory Acute Myeloid Leukemia: Are Supporting Evidences Enough?

Brancati S, Gozzo L, Romano GL, Vetro C, Dulcamare I, Maugeri C, Parisi M, Longo L, Vitale DC, Di Raimondo F, Drago F. - Cancers. 2021

Access to Innovative Neurological Drugs in Europe: Alignment of Health Technology Assessments Among Three European Countries.

Gozzo L, Romano GL, Brancati S, Cicciù M, Fiorillo L, Longo L, Vitale DC, Drago F. - Front Pharmacol. 2022

Bioequivalence, Drugs with Narrow Therapeutic Index and The Phenomenon of Biocreep: A Critical Analysis of the System for Generic Substitution.

Gozzo L, Caraci F, Drago F. - Healthcare. 2022

The therapeutic value of treatment for multiple sclerosis: analysis of health technology assessments of three European countries.

Gozzo L, Romano GL, Brancati S, Longo L, Vitale DC, Drago F. - Front Pharmacol. 2023

Severe Gastrointestinal Toxicity Following the Use of Gilteritinib: A Case Series and Analysis of Postmarketing Surveillance Data.

Gozzo L, Nardo A, Brancati S, Judica A, Duminuco A, Maugeri C, Parisi M, Longo L, Vitale DC, Ruscica R, Romano GL, Mauro E, Fiumara PF, Palumbo GAM, Di Raimondo F, Vetro C, Drago F. - Healthcare. 2023

CRAM - Research Center on Motor Activities



The aim of the research activity is to make the Center a valuable reference, at regional, national and international level for basic, applied and translational research on physiotherapy, occupational therapy, clinical posturology, kinesiotherapy, biomechanics and sport medicine.



Director: **Giuseppe Musumeci**

Clinical Chinesiology Lab

- Postural analysis
- Bioinformatic Postural analysis
- Movement analysis
- Gait analysis
- Dynamic analysis of movement
- Run analysis
- Adapted physical activity
- Kinesitherapeutic activity
- Athletic performance analysis
- Musculoskeletal disorders
- Mechanobiology
- Biomechanics
- Termography





