

CURRICULUM VITAE OF RAFFAELLA ISOLA
ACADEMIC DISCIPLINE: BIOS/13 – HISTOLOGY

Personal data

Raffaella Isola

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Academic qualifications

Degree in Biological Sciences

PhD in Morphological Sciences (XIV cycle, University of Cagliari)

Associate Professor BIOS/13 (previously BIO/17), University of Cagliari

From 1993 to today, she has actively collaborated with public institutions (Italian and foreign universities and institutions) and research institutions and, with continuity over time, on various national and international research projects concerning topics related to pharmacology, cell biology, morphology and histology.

In April 2006 she began working as a researcher in the academic discipline of BIO/17 (Histology), at the Department of Cytomorphology (now the Department of Biomedical Sciences), Faculty of Medicine and Surgery, University of Cagliari, via Università 40, 09100 Cagliari. Since April 2024 she has been associate professor of Histology (formerly BIO/17, now BIOS-13/A), at the same Department.

RESEARCH ACTIVITY

The scientific activity carried out by the writer, with temporal continuity, from 1992 to today, has mainly concerned the following research topics:

- pharmacology and neuroscience with studies on nicotine and alcohol addiction
- cell biology and morphology with studies on mitochondrial potential in vivo using fluorescent vital probes
- ultrastructural morphology in scanning and transmission electron microscopy on the modifications of mitochondrial cristae following activity, and in general on the morphological aspect of cytological characters in salivary glands and other tissues and cells in different conditions
- mitochondrial bioenergetics in cardiac and liver mitochondria and in permeabilized and non-permeabilized murine myotubes, using Clark's oxygraph and in various animal models of pathologies

01/01/1993 - 12/31/1993 Training course in neuropharmacology, winner of a scholarship with the support of the Sardinia Region, Italy, Department of Experimental Biology, University of Cagliari, Italy

01/01/1993-31/12/1993 Collaboration at the Department of Neuroscience (directed by Prof. G.L. Gessa), University of Cagliari, Italy, at the laboratory of Prof. Zvani L. Rossetti. The research focused on alcohol and cocaine addiction in animal models, using the cerebral microdialysis technique.

01/01/1994-30/07/1994: Research collaborator at the Department of Neuroscience (directed by Prof. G.L. Gessa), University of Cagliari, Italy, in the laboratory of Dr. Assunta Imperato. Research has addressed drug and alcohol addiction in animal models with the technique of cerebral microdialysis.

09/01/1994 - 08/31/1996 Visiting Scholar (The Ohio State University fixed-term contract), Department of Psychiatry, Division of Molecular Psychopharmacology, Ohio State University College of Medicine, Columbus, Ohio. I carried out my research activity with Prof. Maria Hadjiconstantinou-Neff for the development of a mouse model of nicotine addiction and the verification of the involvement of the opioid system in the mechanisms of nicotine addiction and withdrawal.

1997 – 1999: Winner of a research contract pursuant to article 37 L.R. 2/94, at the University of Cagliari Department of Cytomorphology, University of Cagliari, Laboratory of Image Analysis and Cellular Biology directed by Prof. Giacomo Diaz. The research focused on the study of mitochondrial potential on cultures of human fetal astrocytes and tumor cell lines using vital fluorescence probes.

1998 – 2002: PhD in Morphological Sciences (XIV cycle), University of Cagliari (coordinator Prof. Alessandro Riva). Thesis entitled: "Mitochondrial potential in fluorescence microscopy: methodological problems, fluctuations and dependence on the permeability transition pore". Tutor Prof. Giacomo Diaz (Professor of Histology at the Faculty of Medicine and Surgery, University of Cagliari).

2002 -2003: Research contracts, Department of Cytomorphology, University of Cagliari, at the Image Analysis and Cellular Biology laboratory, directed by Prof. Diaz. During this period I carried out research supported by a FIRB grant on the effects of two antimicrobial salivary peptides, histatin 3 and 5 on the mitochondrial potential of the yeast *Candida albicans*.

2004-2006 Research contracts at the Department of Cytomorphology, University of Cagliari, at the Electron Microscopy laboratory, directed by Prof. Alessandro Riva. During this period I carried out research funded by a FIRB grant on the effects of two salivary peptides, histatin 3 and 5 on the ultrastructural morphology of the yeast *Candida albicans* in transmission electron microscopy and scanning electron microscopy, adapting the osmic maceration technique used in the laboratory to the study of yeasts.

From 04/01/2006 - Mar 2024 Confirmed Researcher of the Faculty of Medicine and Surgery, Scientific Sector: Histology (BIO/17).

From 04/06/2024-current Associate Professor, Scientific Disciplinary Group 05/BIOS-13, Department of Biomedical Sciences, Faculty of Medicine and Surgery, University of Cagliari.

Scientific director of the Electron Microscopy Laboratory, Faculty of Medicine, Department of Biomedical Sciences, Cytomorphology Section, University of Cagliari.

BELOW THE RESEARCH PROJECTS SINCE I WAS HIRED BY THE UNIVERSITY OF CAGLIARI (2006-present)

2006 – Participant in the PRIN research project (co-financed by MIUR) entitled: Morphometric and cytochemical study of the secretory activity of human salivary glands. (Coordinator Prof. A. Riva).

From 2007 to 2020 - Winner of internal funding at the University of Cagliari - names over the years: Funds for Local Research Projects (formerly 60%), PRID (Projects of Significant Departmental Interest), CAR, FIR (Research Incentive Fund).

2008 - Participant in the PRIN research project (co-financed by MIUR) entitled: Morphofunctional, morphometric and cytochemical study on salivary glands with particular reference to salivary peptides. (Coordinator Prof. Massimo Castagnola).

2009 - Winner of a grant from the University of Cagliari - Fund for the Support of Basic Research and for the Start-Up of Young Researchers (5%), for the project entitled: Effects of melatonin on human salivary glands. Possible role of this hormone in the physiology of these glands.

2010 Participant in the FIRB project (year 2009) entitled: "Multidisciplinary study of the mechanisms of sexual recall in the female defoliant moth *Lymantria dispar*". Responsible: Dr. Carla Masala. Result: Eleggibile.

2012 – Winner of the research funding provided by the Banco di Sardegna Foundation for the project entitled "NAFLD and NASH: morphological, ultrastructural and bioenergetic approach in an animal model. Comparison with human clinical cases"

2012 – Co-recipient of a university grant for research as participant in a 2009 FIRB project deemed suitable, but not financed by MIUR.

2012 – Co-PI for the project entitled: "Morpho-functional investigation on diabetes-induced damage to the cardiovascular system". The project involves two Units, the undersigned is the PI of one of them. Coordinator Dr. R. Vargiu. Source of funding: Autonomous Region of Sardinia - Fundamental or basic research projects. Held in the years 2013-2016

2012-13 Responsible of the research project entitled: "Effect of an in vitro model of diabetes on hippocampal gamma oscillations and mitochondrial redox state", carried out during a research period at the Institute of Physiology and Pathophysiology, Heidelberg University, Germany, with Professor Oliver Kann, funded by DAAD, German Academic Exchange Service.

2017 – Winner of ANVUR 2017 national funding (Financing of basic research activities, FFABR).

2018 - From January to April 2018 I took leave for research purposes at the Laboratory of Fundamental and Applied Bioenergetics, University of Grenoble-Alpes, Grenoble, France, in which I carried out the project entitled: "Mitochondrial oxidative capacity in heart mitochondria after selective AMPK deletion". This project took place within the European COST Action CA15203 Mitoeagle project, which partly financed my stay.

2018 – Winner of the Project entitled: "Acute hypoxia during physical exercise: effects on circulatory regulation, body composition and metabolome in humans and animal models". Source of funding: Autonomous Region of Sardinia - Fundamental or basic research projects 2017 call. Coordinator prof. A. Crisafulli. In the project the writer is responsible for evaluating cardiac mitochondrial bioenergetics in rats trained for running and subjected to physical exercise in a hypoxic atmosphere corresponding to an altitude of 4000 m. To complement the study, the expression of some markers of reactive oxygen species and protein factors involved in oxidative phosphorylation were investigated by western blot.

2019 – Winner of the project entitled: Effects of acute hypoxia on cardiovascular regulation and cognitive functions in athletes". The undersigned is the PI of one of the units involved in the projects. Source of funding: two-year research projects at the University of Cagliari (three-year agreement between the Foundation of Sardinia and the Sardinian universities, peer reviewed), 2018. Coordinator prof. A. Crisafulli. In the project, the unit directed by the writer deals with evaluating cerebral mitochondrial bioenergetics in rats trained to run and subjected to physical exercise in a hypoxic atmosphere corresponding to 4000 m. The unit is also

responsible for evaluating any changes induced by hypoxia on the ultrastructure (observed by TEM) of cardiac and brain tissue with particular attention to mitochondrial morphology.

2020 – Representative to the University of Cagliari of an international agreement with the Pennington Biomedical Research Center, Baton Rouge, Louisiana, USA. The project concerns the study of the 3-D morphology of cultured myotubes mitochondria, observed through the application of osmic maceration in scanning electron microscopy and the correlation of the mitochondrial ultrastructure with the bioenergetics evaluated using a Clark-type electrode. The agreement takes place in collaboration with world-renowned mitochondrial expert Prof. Charles H. Hoppel

2020 – Winner as participant in the PRIN 2020 Call with the Project entitled: TEAM - Role of TDP-43 self-assembly in health and disEase: molecular characteristics, cellular Aspects and animal Models. National coordinator Prof. Fabrizio Chiti. The project involves the undersigned evaluating the ultrastructural morphology and activity of muscle mitochondria in rats treated with peptides that mimic the action of portions of the TDP-43 protein, presumably active in the induction of amyotrophic lateral sclerosis. Head of Unit Prof. Anna Rosa Carta. In progress.

2022 — Winner as participant in the 2022 PRIN PNRR Call with the Project entitled: DECODE-018. Dissecting the Enduring changes in the prefrontal COrtex induced by exposure to the synthetic cannabinoid JWH-018 during aDolescencE: multidisciplinary characterization of the behavioral, neurochemical, and molecular outcomes at adulthood in rats and mutant mice. Coordinator and unit manager Prof. Maria Antonietta De Luca. The project requires the writer to evaluate the damage induced by exposure to synthetic endocannabinoids on the mitochondrial bioenergetics of the prefrontal cerebral cortex. In progress.

SCHOLARSHIPS AND AWARDS

08/01 / 2018-16 / 04/2018 Visiting researcher supported by Mitoegle COST Action CA15203, to carry out the project entitled: Mitochondrial oxidative capacity in cardiac mitochondria after selective deletion of AMPK, Laboratory of Fundamental and Applied Bioenergetics, University of Grenoble Alpes, Grenoble France, with Dr. Hervè Dubouchaud and prof. Uwe Schlattner.

23/10/2012 - 07/02/2013 Visiting Researcher, supported by DAAD (German Agency for Academic Exchange) Institute of Physiology and Pathophysiology, University of Heidelberg, Germany. The research (conducted in the laboratory of Prof. Oliver Kann) dealt with the effect of insulin on gamma oscillations in organotypic cultures of hippocampal slices

01/06/2010 - 16/06/2010 Visiting Researcher supported by the International Cooperation Agreement between the Universities of Cagliari and Gothenburg, Division of Pharmacology, Institute of Neuroscience and Physiology, Sahlgrenska Academy of the University of Gothenburg, Gothenburg, Sweden. Short visit related to my collaboration with Prof. Jörgen Ekström on the morphophysiology of the salivary glands

01/01/1993 - 12/31/1993 Training course in neuropharmacology, winner of a scholarship offered by the Sardinia Region, Italy, Department of Experimental Biology, University of Cagliari, Italy

SUPERVISION OF GRADUATE STUDENTS, POST-GRADUATES AND POST-DOCTORAL FELLOWS

From 2015 to date, supervision of the internship in the Electron Microscopy Laboratory, through the Globus project, of second year students of the Medicine and Surgery Degree, Miyazaki University, Miyazaki, Japan.

September 2022 Co-tutor for the thesis of Francesco Masala, Degree in Biomedical Engineering, University of Cagliari.

22.03.21-22.09.22 Scientific director of the research grant of Dr. Roberta Noli for the project entitled "Relation between the morphology of mitochondrial cristae and their activity", Department of Biomedical Sciences, University of Cagliari, financed with funds from the international agreement with the Pennington Biomedical Research Center, Baton Rouge, Louisiana.

24.01.22-24.07.22. Scientific director of the research grant of Dr. Ylenia Lai for the project entitled "Bioenergetic activity of C2C12 cells", Department of Biomedical Sciences, University of Cagliari, financed with funds from the international agreement with the Pennington Biomedical Research Center, Baton Rouge, Louisiana. 2020-2023

2020-2021 Scientific director of the research grant Dr. Ylenia Lai, 14 months, financed with the project "Acute hypoxia during physical exercise: effects on circulatory regulation, body composition and metabolome in humans and animal models" L.R. 7/2007 annualità 2017 (Promotion of scientific research and technological innovation in Sardinia - FSC resources 2014-2020 - Pact for the Development of the Sardinia Region), University of Cagliari. Settembre 2016 collaborazione occasionale con il Dott. Alberto Casti. Progetto: "Indagine morfo-funzionale sulle lesioni del sistema cardiovascolare indotte dal diabete". Dipartimento di Scienze Biomediche, Università degli studi di Cagliari. Finanziato con il progetto RAS esercizio 2012 L.R. 7/2007

2016 Research grant Dr. Michela Isola. Project: "Morpho-functional investigation of diabetes-induced lesions of the cardiovascular system". Department of Biomedical Sciences, University of Cagliari. Financed with the RAS project for financial year 2012 L.R. 7/2007

2014-2016 Scientific manager of the research project relating to the Research Grant of Dr. Alberto Casti. Project: "Morpho-functional investigation of diabetes-induced lesions of the cardiovascular system". Department of Biomedical Sciences, University of Cagliari. Financed with the RAS project for financial year 2012 L.R. 7/2007

2012-2014 Scientific manager of the research project relating to the Research Grant of Dr. Paola Solinas. Project: "Ultrastructural and physiological study of mitochondria in exocrine and endocrine glands". With the support of: Sardinia Region, as part of the Master and Back program. Department of Biomedical Sciences, University of Cagliari.

2010-2012 Scientific responsible for the contract of Dr. Paola Solinas for a Young Researchers grant, LR 7 August 2007, Autonomous Region of Sardinia, POR FSE 2007-2013

February 2017 tutor for Pietro Spigno's degree thesis, Degree in Exercise and Sports Sciences, Faculty of Medicine and Surgery, University of Cagliari.

July 2015 Co-tutor for Cristina Contini's degree thesis, Degree in Toxicology, Faculty of Biology and Pharmacy, University of Cagliari.

2003-2006 Co-tutor of the PhD thesis of Dr. Paola Solinas, PhD in Morphological Sciences, Faculty of Medicine and Surgery, University of Cagliari.

EDUCATIONAL ACTIVITIES

From the Academic Year 2023-2024 to present Teacher of an integrated course in Histology and Embryology, in the Degree in Medicine and Surgery, Faculty of Medicine, University of Cagliari, 7 CFU.

From the Academic Year 2022-2023 to present Teacher of the Histology module in the integrated course of Histology, Anatomy, Microbiology, in the Course in Obstetrics, University of Cagliari, 2 CFU.

From the Academic Year 2020-2021 to 2022-2023 Teacher of an integrated course in Histology and Embryology, in the Degree in Medicine and Surgery, Faculty of Medicine, University of Cagliari, 3.5 CFU.

From the 2017-18 Academic Year to the present Teacher of the Histology module in the integrated course of Basic Skills in the following degrees: Physiotherapy, Speech Therapy, Professional Education, University of Cagliari, 2 CFU.

From the Academic Year 2021-2022 Teacher of the Histology module in the integrated course of Basics of Life in the Course in Nursing, Nuoro branch, University of Cagliari, 2 CFU.

From the Academic Year 2013-2014 to the Year 2016-17 Teacher of the Histology module in the integrated course of Applied Biology and Histology, Degree in Exercise and Sports Sciences, University of Cagliari, 3 CFU.

Academic Year 2014-2015 Teacher of the Embryology module in the integrated course of Molecular Cytology and Human Embryology, Master's Degree Course in Cellular and Molecular Biology, Faculty of Biology and Pharmacy, University of Cagliari, 2 CFU.

From AY 2006-2007 to AY 2011-2012 Teacher in the Course of Histology and Embryology for the Course of Studies in Medicine and Surgery, Faculty of Medicine and Surgery, University of Cagliari, 2.5 CFU.

In the 2011-2012 Academic Year, Teacher of the Histology module in the integrated course of Basics of Life in the Degree in Nursing, Nuoro branch, University of Cagliari, 2 CFU.

From the AY 2006-2007 to the AY 2009-2010 Teacher in the Histology course for the course of study in Speech Therapy, Faculty of Medicine and Surgery, University of Cagliari, 2 CFU.

From AY 2006-2007 to AY 2009-2010 Teacher in the Histology course for the course of studies for Rehabilitation Physiotherapists, Faculty of Medicine and Surgery, University of Cagliari, 2 CFU.

From AY 2007-2008 to AY 2009-2010 Teacher in the Histology course for the course of studies for Healthcare Assistants, Faculty of Medicine and Surgery, University of Cagliari, 2 CFU.

In the AY 2008-2009 and from the AY 2011-2012 Teacher of the Histology module in the integrated course of Applied Biology and Histology, Course in Physical Activity and Sports Sciences, Faculty of Medicine and Surgery, University of Cagliari, 3 CFU.

From AY 2006-2007 to AY 2011-12 Teacher in the Histology Course for the specialization school in Dermatology and Venereology (Faculty of Medicine and Surgery, University of Cagliari), 1 CFU.

Appointed for the year 2006-2007 to teach Histology in the Master in Thalassotherapy and Fitness Techniques in the Spa.

ORGANIZATION OF SCIENTIFIC MEETINGS

09/23/2014 Member of the organizing committee of the Workshop directed by Prof. A. Riva on the occasion of the 200th anniversary of the death of Clemente Susini, creator of the Anatomical Waxes collection of the University of Cagliari and chief model maker of the La Specola wax museum in Florence. University of Cagliari.

INSTITUTIONAL RESPONSIBILITIES

From 2022 member of the transfer commission, Course in Medicine and Surgery, University of Cagliari.

2018-2024 member of the board of the Department of Biomedical Sciences, University of Cagliari

2018- 2024 member of the Faculty of Medicine and Surgery, University of Cagliari

2024 member of FIR commission (Research Financing), University of Cagliari

2020-present Member of the CdS validation commission in Speech Therapy, University of Cagliari

2024-present Member of the CdS validation commission in Physiotherapy, University of Cagliari

2020-present CAV Member CdS in Physiotherapy, University of Cagliari

2012-2017 Contact person for the quality of teaching, Degree in Motor and Sports Activities Sciences, University of Cagliari.

2012-2017 Erasmus Representative, Degree in Motor and Sports Activities Sciences, University of Cagliari.

2008-2014 Member of the Joint Teaching Commission, Faculty of Medicine, University of Cagliari.

DOCTORAL PROGRAMS AFFILIATION

2022 participation in the PhD program in "MOLECULAR AND TRANSLATIONAL MEDICINE", University of Cagliari

2010-2012 participation in the PhD program in "MORPHOLOGICAL AND FUNCTIONAL SCIENCES", University of Cagliari

2009 participation in the PhD program in "MORPHOLOGICAL SCIENCES", University of Cagliari

ASSIGNMENTS OF TRUST

Reviewer for Micron

Reviewer for Microscopy research and technique

Reviewer for Communications Biology

Reviewer for BBA - Molecular Basis of Disease

Reviewer for Regulatory Peptides

Reviewer for Food and Function

Reviewer for Archives of Oral Biology

Reviewer for Frontiers in endocrinology

Reviewer for Journal of Neuroscience Research

Reviewer for Tissue and Cell

DAAD (German Academic Exchange Agency) scholarship evaluator

MEMBERSHIP OF SCIENTIFIC SOCIETIES

2001 - present Member of the Italian Society of Anatomy and Histology

2006 - present Member of the National College of Histology and Embryology Teachers

2017- present Member of the Mitochondrial Physiology Society

MAIN COLLABORATIONS

With Prof. Charles H. Hoppel, Mitochondrial Physiology, former Director of the Center for Mitochondrial Diseases Division of Clinical Pharmacology, Department of Pharmacology, Case Western University, Cleveland, Ohio, currently prof. emeritus at the same university and contract principal investigator at the Pennington Biomedical Research Center, Baton Rouge, Louisiana. Following my invitation as Visiting Professor at the University of Cagliari in December 2017, a collaboration emerged which mainly focuses on the identification of the correlation between the morphologies of the mitochondrial cristae (observed with the osmic maceration technique at HRSEM), their energy efficiency and the dependence of both on some proteins presumably important in the constitution of the cristae. With Prof. Hoppel we share a three-year international agreement (from July 2020) on the aforementioned research project funded by the Pennington Biomedical Research Center, Baton Rouge, Louisiana, now being renewed. Regarding the first research carried out, two scientific articles are in preparation.

With Prof. Hervè Dubouchaud and Prof. Uwe Schlattner, Laboratory of Fundamental and Applied Bioenergetics, University of Grenoble-Alpes, Grenoble France. Following an experience as a visiting researcher from January to April 2018 at the same laboratory for the project entitled: Mitochondrial oxidative capacity in heart after selective AMPK deletion (carried out within the European project COST Action CA15203 Mitoeagle), a collaboration was born with professors Hervè Dubouchaud and Uwe Schlattner. During the period in France I took part in a larger project on the consequences of selective cardiac knock out of the $\alpha 1$ and $\alpha 2$ subunits of AMP protein kinase (AMPK). I evaluated mitochondrial bioenergetics on both male and female mice. The collaboration continued upon my return to Italy with the analysis of the ultrastructural morphology of cardiac tissue in transmission electron microscopy of male knock out mice and controls. Following this collaboration, an article regarding the study on male mice was published in the journal *Frontiers in Cell and Developmental Biology*. The collaboration is continuing with the collection of ultramicroscopic morphology data relating to the female model of selective cardiac knock-out. I have invited Prof. Uwe Schlattner to the University of Cagliari as visiting Professor in 2022 and Prof. Hervè Dubouchaud in 2024.

Collaboration with Prof. Jörgen Ekström, professor emeritus at the Department of Pharmacology, University of Gothenburg, Sweden, on the physiology of the salivary glands. In particular, the collaboration concerns the action of melatonin on the secretion of the salivary glands, evaluated with the application of morphometric methods to the ultrastructural modifications of the secreting cells.

I invited Prof. Jörgen Ekström as part of the Visiting Professor program several times in the years 2007-2015, for short-term and long-term visits.

With Prof. Oliver Kann, Neuroscience, Institute of Physiology and Pathophysiology, Heidelberg University, Germany. Having carried out a period of research in 2012-13 at the Institute of Physiology and Pathophysiology, Heidelberg University, Germany, financed by DAAD, the publication of a scientific work resulting from the same was then completed.

With Prof. Nicola Lai ING-IND/24, currently associate professor at the University of Cagliari, previously associate professor at Dominion University, Norfolk, Virginia. He took part in the 2013 RAS project on the damage of type I diabetes on the cardiovascular system, we then collaborated in a study on cardiac

mitochondrial bioenergetics in an animal model of non-obese type II diabetes and in other studies. A paper has been published and another one is submitted.

Prof. Giacomo Cao, ING-IND/24, University of Cagliari, collaboration on the ultrastructure in transmission electron microscopy of an algae potentially useful for the purification of water from heavy metals. A job has been published.

With Prof. Anna Rosa Carta, BIO/14, University of Cagliari, collaboration for the study of the ultrastructural morphology and morphometry of brain mitochondria in a Parkinson's model in *Drosophila melanogaster*. A job has been published. I am a participant in his research unit in the ongoing PRIN 2020.

With Dr. Antonella Rosa, general pathologist, University of Cagliari. Collaboration for the study on the effects of new anti-tumor molecules of plant origin on variations in mitochondrial potential and density of lipid droplets and intracellular membranes by means of vital fluorescent dyes on tumor cell cultures. Several works have been published.

Collaboration with Prof. Tiziana Cabras, biochemist, University of Cagliari, Dr. Giancarlo Colombo, Institute of Neuroscience, CNR, Cagliari and prof. Ekström, for studying saliva proteomics in Sardinian preferring and Sardinian non-preferring drinking rat strains. The collaboration resulted in scientific work.

With the mourned Prof. Antonio Crisafulli BIO/09, Department of Medical Sciences and Public Health, University of Cagliari and Dr. Romina Vargiu we shared two research projects (RAS 2017 and FBS 2018). In summary, my part was about the effect of acute hypoxia on the activity of cardiac and brain mitochondria in trained rats. Overall, the projects included multidisciplinary and translational aspects of acute hypoxia. In particular, Prof. Crisafulli, a sports doctor, addressed the scientific problem on non-competitive athletes, while Dr. Vargiu and I addressed corresponding animal models. We have published two papers.

PUBLICATIONS

Co-author of educational books

Edited by Mattioli Belmonte – Nistri. Autori. Altobelli-Bani-.... **R. Isola**... Tamagnone-Trubiani-Vannucchi. Istologia Umana. Idelson Gnocchi. Ed. 2020

Edited by Mattioli Belmonte – Nistri. Autori. Altobelli-Bani-.... **R. Isola**... Tamagnone-Trubiani-Vannucchi. Istologia Umana. Idelson Gnocchi. Ed. 2025 in press

Articles in Journals

1. Giovanni Perra, Andrea Caddeo, Francesca Sedda, Giacomo Cao, **Raffaella Isola**, Alessandro Concas, Andrea Perra, Nicola Lai: Deleterious Effects of Plastic Component Bisphenol A on Mitochondrial Function in Human Intestinal Cells. Submitted February 2025
2. Pintori N, Serra MP, Carai A, Lobina C, **Isola R**, Noli R, Piras G, Spano E, Baumann MH, Quartu M, De Luca MA. (2024) Evidence for enduring cardiac and multiorgan toxicity after repeated exposure to the synthetic cannabinoid JWH-018 in male rats. *Toxicology*. 2024 Jul 5:153878. doi: 10.1016/j.tox.2024.153878.
3. Boi M, Demontis R, Isola M, **Isola R**, Loy F, Serra MP, Trucas M, Ekström J, Quartu M. (2024) The human major sublingual gland and its neuropeptidergic and nitrenergic innervations. *Ann Anat* May 29:255:152291. doi: 10.1016/j.aanat.2024.152291. Online ahead of print.
4. Isola M, Maxia C, Murtas D, Ekström J, **Isola R**, Loy F. (2023) Prostate-specific antigen: An unfamiliar protein in the human salivary glands. *J Anat*. 2023 Dec 18. doi: 10.1111/joa.13996
5. Lai Y, Loy F, Isola M, Noli R, Rinaldi A, Lobina C, Vargiu R, Cesare Marincola F, **Isola R** (2023). Male and female mitochondria respond differently after exercising in acute hypoxia. *Biomedicines* 11(12), 3149, doi: 10.3390/biomedicines11123149
6. **Isola R**, Lai Y, Noli R, Masala C, Isola M, Loy F (2023) Melatonin ultrastructural localization in mitochondria of human salivary glands. *J Anat*. 242(2):146-152. doi: 10.1111/joa.13775
7. Rosa A, **Isola R**, Pollastro F, Nieddu M (2022). Effect of the natural polymethoxylated flavone artemetin on lipid oxidation and its impact on cancer cell viability and lipids. *Fitoterapia*, vol. 156, ISSN: 1971-551X, doi: 10.1016/j.fitote.2021.105102
8. Mulliri G., Magnani S., Roberto S., Ghiani G., Sechi F., Fanni M., Marini E., Stagi S., Lai Y., Rinaldi A., **Isola R.**, Vargiu R., Spranger M. D., Crisafulli A. (2022). Acute Exercise with Moderate Hypoxia Reduces Arterial Oxygen Saturation and Cerebral Oxygenation without Affecting Hemodynamics in Physically Active Males. *International Journal Of Environmental Research And Public Health*, vol. 19, 4558, ISSN: 1660-4601, doi: 10.3390/ijerph19084558
9. Tokarska-Schlattner M*, Kay L*, Perret P*, **Isola R***, Attia S, Lamarche F, Tellier C, Cottet-Rousselle C, Uneisi A, Hininger-Favier I, Foretz M, Dubouchaud H, Ghezzi C, Zuppinger C, Viollet B, Schlattner U. (2021) Role of cardiac AMPK in a non-pathological setting: evidence from cardiomyocyte-specific, inducible AMPK α 1 α 2-KO mice. *Frontiers in Cell and Developmental Biology* vol. 9, p. 1-18 * equal contribution doi: 10.3389/fcell.2021.731015
10. **Isola R**, Broccia F, Casti A, Loy F, Isola M, Vargiu R. (2021) STZ-diabetic rat heart maintains developed tension amplitude by increasing sarcomere length and crossbridge density. *Experim Physiol Open Access* 106: 1572 – 1586. doi: 10.1113/EP089000
11. Loy F, Isola M, Masala C, **Isola R**. (2021) Reactivity of human labial glands in response to cevimeline treatment. *Anat Rec (Hoboken)* 304(12):2879-2890. doi: 10.1002/ar.24617. Online ahead of print.
12. Gnaiger Erich et al — MitoEAGLE Task Group (2020) Mitochondrial physiology. *Bioenerg Commun* 1. doi:10.26124/bec:2020-0001.v1

13. Isola M, Soru S, Loy F, Malavasi V, **Isola R***, Cao G. (2021) Suitability of the thawed algae for transmission electron microscopy study: Ultrastructural investigation on *Coccomyxa melkonianii* SCCA 048. *Microsc Res Techn* 84: 675-681. doi: 10.1002/jemt.23626. *Corresponding author
14. Rosa A, **Isola R**, Nieddu M, Masala C. (2020) The role of lipid composition in the sensory attributes and acceptability of the salted and dried mullet roes (Bottarga): A study in human and animal models. *Nutrients*, 12: 3454 (pp. 1–18). doi: 10.3390/nu12113454
15. Lai N, Kummitha CM, Loy F, **Isola R**, Hoppel CL. (2020) Bioenergetic functions in subpopulations of heart mitochondria are preserved in a non-obese type 2 diabetes rat model (Goto-Kakizaki) *Scientific Reports*, 10:5444. doi: 10.1038/s41598-020-62370-8
16. Rosa A, **Isola R**, Pollastro F, Caria P, Appendino G, Nieddu M. (2020) The dietary flavonoid eupatilin attenuates in vitro lipid peroxidation and targets lipid profile in cancer HeLa cells. *Food Funct.* 11: 5179-5191. doi: 10.1039/d0fo00777c
17. Casu MA, Mocci I, **Isola R**, Pisanu A, Boi L, Mulas G, Greig NH, Setzu MD, Carta AR. (2020) Neuroprotection by the Immunomodulatory Drug Pomalidomide in the *Drosophila* LRRK2WD40 Genetic Model of Parkinson's Disease. *Front Aging Neurosci.* 12:31. doi: 10.3389/fnagi.2020.00031. eCollection 2020
18. Loy F, Serra MP, Boi M, **Isola R**, Ekström J, Quartu M. (2020) Tyrosine-hydroxylase, dopamine β -hydroxylase and choline acetyltransferase-like immunoreactive fibres in the human major sublingual gland. *Arch Oral Biol.* 109:104571. doi: 10.1016/j.archoralbio.2019.104571.
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ABSTRACTS

Out of about 60 abstracts presented at several Congresses, I indicate those of the last 10 years

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22. Lai Y, Noli R, Isola M, Loy F, Vargiu R , **Isola R**. Mitochondria OXPHOS after acute hypoxia in trained rats. 74° Congresso della Società Italiana di Anatomia ed Istologia, Bologna 23-24 Settembre 2021
23. **Isola Raffaella**, Noli R., Isola M., Crisafulli A., Vargiu R., Loy F., Lai Y. In rat brain and heart acute hypoxia induced mild changes in OXPHOS in both sexes. Presentato alla Bioenergetics communications (BEC) inaugural conference, Bioblast 2022, che si è svolta ad Innsbruck il 29-30 giugno, 2022
24. **Isola R**, Lai Y, Hoppel CH, Noli R: Mitochondrial morphology and bioenergetics in C2C12 myotubes. 75° Congresso della Società Italiana di Anatomia ed Istologia, Padova 14-16 Settembre 2022; Italian Journal of Anatomy and Embryology, 126 (1): 319, 2022. ISSN: 1122-6714.
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26. Michela Isola, Lai Ylenia, Roberta Noli, Francesco Loy, **Raffaella Isola**: Preliminary study at ultrastructural level on prostate specific antigen (PSA) in salivary glands. 75° Congresso della Società Italiana di Anatomia ed Istologia, Padova 14-16 Settembre 2022; Italian Journal of Anatomy and Embryology, 126 (1): 200, 2022. ISSN: 1122-6714.
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28. **Isola R**, Noli R, Lai Y, Hoppel CH. Mitochondrial ultrastructural morphology in the switch from myoblasts to myotubes. Cell Symposia: Multifaceted Mitochondria, Sitges, Spain October 27-29, 2024.

In particular, I presented the following oral presentations at the Meetings:

58° Congress of the Italian Society of Anatomy, Chieti 17-19 September 2004, with the following presentation: Morphological changes induced by Histatins in *Candida albicans*: a microscopic and submicroscopic comparison.

68° Congress of the Italian Society of Anatomy and Histology, Ancona Chieti 18-20 September 2014. With the oral communication: Cardiac mitochondria alteration and peripheral vessel morphology in female diabetes.

10th MiPschool and MITOEAGLE Workshop, Obergurgl, Austria 23-30 July 2017 . with the following presentation: Do mitochondria counteract diabetes impairment by means of morphological and physiological strategies?

11h MiPschool 2018 Tromso-Bergen, Norvegia, 20-24 October 2018. With the oral communication: AMPK deficiency elicits changes in OXPHOS in heart mitochondria.