

PERSONAL INFORMATION

Maria Carmela Cerra

University of Calabria  
 Department of Biology, Ecology and Earth Science  
 Cubo 6 C, Ponte P. Bucci

0984 492907

maria\_carmela.cerra@unical.it

[https://www.unical.it/portale/strutture/dipartimenti\\_240/dibest/docenti/cerra/](https://www.unical.it/portale/strutture/dipartimenti_240/dibest/docenti/cerra/)

Female | 25/11/1963 | Italian

Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input checked="" type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist / Principal Investigator
<input type="checkbox"/> Mid-Management Level	<input type="checkbox"/> Associate Professor	<input type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

1994-today

**Full professor of Physiology**

University of Calabria, Department of BEST

- Delegate of the Dean for the Doctorate of Research;
- Scientific director of the Laboratory of Organ and System Physiology (Department of Department of Biology, Ecology and Earth Sciences, University of Calabria, Italy);
- Director of the Research Group in Physiology at the Department of Biology, Ecology and Earth Science, University of Calabria, Italy;
- Member of the "Giunta di Dipartimento" at the Department of Biology, Ecology and Earth Science, at University of Calabria;
- Coordinator of the Doctorate in Life Science and Technology at University of Calabria;
- Past Coordinator of the Doctorate Fellowship in Life Sciences at University of Calabria;
- Past member of the Scientific Board of the High School in Clinical Pathology, both at University of Calabria;
- Member of the Scientific Advisory Board of the Italian Society of Physiology;
- Member of the Italian Society for Cardiovascular Research (as component of the Auditor Board), Italian Physiological Society (past component of the Scientific Advisory Board), Society for Experimental Biology;
- Member of the Research Group at University of Calabria of the Italian Institute for Cardiovascular Research;
- Professor of Molecular Physiology for Master students in Biotechnology for the Human Health and of Cell and System Physiology at the Faculty of Pharmacy, Nutritional and Health Sciences, University of Calabria;
- Past vice Director of the Department of Pharmaco-Biology (University of Calabria, Italy);
- Director of Master in "Applicative aspects in clinical nutrition", Faculty of Pharmacy, Nutritional and Health Sciences, University of Calabria;
- Responsible for CONISMA of the Laboratory of Organ and System Physiology, DiBEST, UNICAL.
- Eligible Member of the Italian National Examining board for Professor position.

EDUCATION AND TRAINING

1989-today

**Full Professor, PhD in Animal Biology**

**2013-today** Full professor of Physiology, University of Calabria

**2003-2012** Associate Professor of Physiology, (BIO/09) Faculty of Pharmacy, University of Calabria.

**1994-2003** Researcher of Physiology, Department of Pharmaco-Biology, Faculty of Pharmacy, University of Calabria;

**1989-1991** Doctorate of Research in Animal Biology. Thesis: "Studio autoradiografico quantitativo dei recettori cardiaci per i cardiopeptidi atriali: analisi comparata" University of Calabria, Zoological Station "A. Dohrn", Naples.

WORK ACTIVITIES

**Editorial activity**

Academic editor for Antioxidants (MDPI)  
 Co-Guest Editor for Antioxidants (MDPI) of the special Issue "The NOS/NO system and the heart"  
 Journal of Experimental Biology, General and Comparative Endocrinology, Cell and Tissue Research, Journal Pharmacology and Experimental Therapeutics, Circulation Research, Gene, American Journal Physiology, Acta Physiologica, Cardiovascular Diabetology, Cancer therapy, Peptides, Endocrine, PLOSOne, Molecules.  
 Guest Editor for BBA Bioenergetics of the Special Issue "Radical Species, Mitochondria and Cardiac Function" (2009).  
 Editor of the volume "Chromogranins: from Cell Biology to Physiology and Biomedicine". Unipa Springer Series (Springer Verlag) 2017.  
 Co-Editor for Current Medicinal Chemistry for the Special Issue "Mechanisms, and pathophysiology of obesity: upgrading a complex scenario". 2019 In preparation.  
 CO-Guest Editor for Antioxidants of the Special Issue "NOS/NO system and the heart". In progress.  
 Revisor for projects (e.g.. 2013 - prot. INAJ135039, Università dell'Insubria), and for national and international PhD thesis (e.g. Univeristy of Bologna-Ravenna; University of Singapore, Dr. Ong Li Ying Jasmine).  
 Member of examining board for doctorate fellowship.  
 Responsible for research fellowships in Physiology at the University of Calabria.

**Grants**

PI for the PRIN project: Coordinatore Nazionale del progetto 20158JNY2H: "Cardiovascular adaptation to hypoxia: a microfluidic approach on natural animal models" selected for founding from the University of Calabria for its elevated evaluation; POR\_CUP J88C17000370006 Healthy Whey; PON\_03PE\_00009\_1 -NEUROMEASURES; PON\_DEMET "Regulation of the heart function: a role for selenoproteins?" within a Italy-France PhD co-tutorship program, University of Rouen (France), DC2N, Inserm U982; RA\_ ARS01\_00401; PON\_ : ARS01\_00568\_ SI.FI.PA.CRO.DE.

**ADDITIONAL INFORMATION**

**Collaborations**

In addition to the numerous collaborations at UNICAL, Prof. Cerra collaborates with many national and international laboratories. The structural, ultrastructural, molecular and hemodynamic aspects of the cardiac remodelling in fish in relation to both development and adaptation to environmental challenges are analysed in collaboration with Lab. of Human Anatomy and Experimental Biomedicine at Univ. Of Palermo (**Prof. G. Zummo, Prof. F. Cappello, Prof. F. Farina**), with the lab of Human Anatomy (Univ. Cantabria, Santander, Spain: **Prof. J. M. Icardo**), of the Department of Biological Sciences, National Univ. of Singapore (**Prof. Y.K. Ip**), of the Univ. of Aarhus and Odense (**Prof. Angela Fago and Prof. Frank B. Jensen**), and with the Ecotekne Research Center (Univ. Salento: **Prof. T. Verri**).  
 CgA and its derived peptides, and Selenoprotein T are studied in collaboration with San Raffaele Institute (DIBIT, Milan, **Prof. A. Corti**), with Dep. of Medicine and Molecular Genetic Center (Univ. California, San Diego: **Prof. S. Mahata**), the Cell Neurobiology Section at NIH (Bethesda, USA: **Dr. P. Loh**), the Institute for Nervous System Physiopathology INSERM (Strasbourg, France: **Prof. M.-H. Metz-Boutigue**), the Unit DC2N, Inserm U982 (Univ. Rouen: **Dott. Y. Anouar**).  
 Researches on ischemic cardioprotection are carried out in collaboration with the Dept. Of Clinical and Biological Sciences (Univ. Turin, San Luigi Hospital Orbassano, Italy: **Prof. P. Pagliaro and Prof. C. Penna**) e with Dept. Of Life Sciences and System Biology (Univ. Turin: **Prof. G. Alloatti and Prof. M.P. Gallo**).

## Main research interests

The vertebrate heart is a complex endocrine organ with a myriad of autocrine-paracrine circuits that provide an impressive functional plasticity in response to internal and external challenges. Fundamental for this plasticity is cardiac heterogeneity, exemplified by the selective ability of the different regions, tissues and cells of the heart to respond to a large variety of stimuli, either physical (i.e. stretch and shear stress), or chemicals (i.e. endogenous and exogenous modulators, including environmental substances).

Studies, documented by the numerous original papers, reviews and meeting communication, were carried out by using a comparative approach on different paradigms of cardiac organization of both non-mammalian and mammalian Vertebrates such as fish (polar, temperate, tropical), amphibians (frog) and mammals (rat). Among non-mammalian Vertebrates, elasmobranch and teleost species were chosen as representative of the different morpho-functional architecture of the vertebrate heart (e.g. ventricular myocardium with spongy structure and lacunar perfusion: teleost and amphibians; mixed myocardium with coronary vessels: elasmobranch). This makes them precious natural models not only for curiosity-driven investigations, but also for applicative studies in the context of environmental and conservation research.

The research had the purpose of highlighting aspects of unity and diversity in the molecular and cellular system of signal transduction activated in the vertebrate heart under basal conditions and in response to challenges such as environmental stressors (e.g. water temperature and availability, hypoxia), autocrine-paracrine modulation of the heart (e.g. the NO system, NP, AngII, CgA-derived peptides, Selenoprotein T), and physiopathological stress (e.g. ischemic damage).

### Main research interests

#### 1. **Mechanisms of cardioprotection in Vertebrates: from fish to mammals**

- a. Autocrine-paracrine control of cardiac homeostasis in Vertebrates: Natriuretic Peptides, Angiotensin II, Chromogranin-A-derived peptides, Selenoprotein T,  $\beta$ 3-adrenergic receptors
- b. Ischemic cardioprotective modulation in mammals: Chromogranin-A-derived peptides, Selenoprotein T
- c. The cardiovascular role of nutrition-related substances

#### 2. **Adaptive and Environmental cardiac physiology: from polar to tropical and temperate fish**

- e. Morpho-functional plasticity of the fish heart: organ, cell and molecular remodelling in relation to environmental challenges and ontogenetic growth
- f. The Nitric control of the fish heart

### Results in brief

#### 1. **Mechanisms of cardioprotection in Vertebrates: from fish to mammals**

Studies identified the mechanisms activated by natural food elements, and by humoral mediators of the alimentary behavior, that modulate the cardiac performance of mammals. Results described the direct cardiac effects of the pro-glucagon-derived peptide GLP-2, showing, for the first time, the presence of cardiac receptors for this anorexigen factor and endocrine mediator of the gastrointestinal function. Analysis on the role of quercetin and myricetin in the beat-to-beat control of cardiac performance revealed different effects in terms of inotropism, lusitropism and coronary motility (collaboration with Prof. F. Mulè, Unipa; Proff. B De Cindio, D. Gabriele, FR. Lupi, N. Baldino, Unical).

Studies also focused on the autocrine-paracrine control of cardiac homeostasis in Vertebrates describing the cardioactive role of humoral substances such as Natriuretic Peptides, Angiotensin II, Chromogranin-A-derived (CgA) peptides (Vasostatin, Catestatin, Cateslytin, Chromofungin), Selenoprotein T (SELT),  $\beta$ 3-adrenergic receptors, and the neurotransmitter Nitric Oxide (NO). Analyses were carried out by using perfusion heart techniques, immunolocalization and molecular biology. Attention was focused on the effects on the mechanical contractile and relaxing performance, on ischemic cardioprotection, and on intracellular signalling cascades (collaboration with Prof. A. Corti, San Raffaele, Milan; Prof. S. Mahata, Univ. California, San Diego; Dr. P. Loh, NIH, Bethesda, Prof. M.-H. Metz-Boutigue INSERM, Strasburg; Dott. Y. Anouar, Unit DC2N, Inserm U982, Rouen; Proff. P. Pagliaro, C. Penna Univ. Turin, G. Alloatti, M.P. Gallo, Univ. Turin).

#### 2. **Adaptive and Environmental cardiac physiology: from polar to tropical and temperate fish**

In relation to the morpho-functional heterogeneity of the Vertebrate heart, studies analysed, particularly in fish, cardiac plasticity observed as structural and ultrastructural rearrangement in relation to development, and to environmental challenges (e.g. hypoxia, pollutants, extreme environments such as temperate and polar waters). Results described the hemodynamic modulation elicited on the heart by hormones, such as NP and AngII and its related peptides (e.g. alamandine), and the ubiquitous involvement of NO in short- and long-term autocrine/paracrine regulator of cardiac function (in collaboration with Proff. G. Zummo, F. Cappello, University of Palermo, Italy; Prof. J. M. Icardo, University of Cantabria, Santander, Spain; Prof. Angela Fago and Prof. Frank B. Jensen, Univ. of Aarhus and Odense; Prof. Y.K. Ip, National University of Singapore; Prof. T. Verri, University of Salento, Italy).

The results of the above studies have been published in peer-reviewed International journals with impact, and have been communicated to more than 100 national and international meetings.

**Total number of publications in peer-review journals 121; 7 Book chapters; 1 book Co-Editor  
H index 34**

For complete list of publications see

SCOPUS <https://www.scopus.com/authid/detail.uri?authorId=7003667692>

ORCID <https://orcid.org/0000-0002-2091-928X>