

## Personal data

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### Laura Vergani, PhD

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## Current Position

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Associate Professor of Physiology (SSD BIO/09), School of Sciences, University of Genova

## EDUCATION/TRAINING

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1981 High school Diploma with full marks, Liceo Classico Andrea D'Oria, Genova, Italy

1986 Degree 'Laurea' in Biological Sciences (110/110 cum laude), University of Genova, School of Sciences. Field of Study: Molecular Biophysics

1987 Qualification to the Profession of Biologist (150/150)

1997 PhD in Biophysics at University of Genova, School of Medicine. Field of study: Molecular/Cellular Biophysics. Thesis: "Role of chromatin structure in the cell cycle regulation".

## ACADEMIC POSITIONS

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1987-1988 Research Fellow at the Institute of Biophysics, School of Medicine, University of Genova

1989 Research Fellow in Molecular Biology at the FELS Research Institute for Cancer Research and Molecular Biology, Temple University of Philadelphia (under the supervision of Prof. Carlo Croce)

1989-1991 PhD student in Biophysics, at the Institute of Biophysics, School of Medicine, University of Genova

1992-1993 Post-doctoral Fellow at the Institute of Biophysics, University of Genova

1994-2000 Researcher in Biophysics (SSD E10X-Biofisica) at the School of Medicine, University of Genova

2001 Grading in the SSD BIO/09–Physiology

2002-2013 Assistant Professor in Physiology at the Department of Biology, School of Sciences, University of Genova

2015 Associated Professor of Physiology at the School of Sciences, University of Genova

### **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

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She supervised more than 30 thesis for students at the Faculty of Sciences and of Medicine, 3 PhD master's thesis, 6 Postdocs. Several of whom now hold permanent positions in national (University, CNR) or international Laboratories.

### **TEACHING ACTIVITY**

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1992-2010 Course of 'Biophysics', School of Medicine; University of Genova

2007-2011 Course of 'Applied Physiology', Degree in Biological Sciences

2011-2014 Course of 'Molecular Physiology', Degree in Biological Sciences

2000-2010 'Biophysics', School of Medical Specialization in Anesthesia, Orthopedics, Vascular Surgery

2010- 'Human Physiology', School of Medical Specialization in Medical Physics

2012- 'Human Physiology'; Degree in Chemistry

2015- 'Animal Physiology' Degree in Environmental Sciences

### **AREA OF EXPERTISE**

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Biophysics; Molecular and Cellular Physiology; Molecular Biology; Biochemistry; Protein Engineering.

### **Publications**

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Author of more than 200 publications that are related to molecular and cellular biophysics/physiology. More than 80 publications are paper published in International Scientific Journals reviewed by ISI.

As reported today by Google Scholar the publications reviewed were cited 1286 times, with an index "h" equal to 23.

### **BOOK CHAPTERS**

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**Vergani L.** "Ingegneria genetica ed Anticorpi monoclonali" in 'Biofisica e Tecnologie Biomediche' Nicolini e Rigo editors, Zanichelli 1992 (text for students of the course of Biophysics, School of Medicine)

## **EDITORIAL BOARDS/REVIEWER**

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- Editorial Board Member of World Journal of Hepatology.
- Reviewer for international scientific journals: Journal of Cellular Biochemistry, Cytometry, Stem Cells, Biochimica & Biophysica Acta, Journal of Neurochemistry Biochemistry Molecular Biology Reports Cell Biology and Toxicology Environmental Toxicology, International Journal of Biomedical Science

## **GRANT REVIEWER/AGENCY**

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- Reviewer for different projects PRIN
- Reviewer for GEV 05 of the ANVUR agency (National Agency for evaluating University and Research products) for the period 2004-2010 (VQR 2004-2010).
- Reviewer for the Scientific Projects of FWF Austrian Science Fund' (Austria)
- Reviewer for the University of Padova for local grants

## **ORGANIZATION AND INVITED PRESENTATIONS TO INTERNATIONAL CONFERENCES**

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She has been invited speakers at many international conferences.

She has been in the Organizing Committee of NATO 'International School of Pure & Applied Biostructure', Erice from 1988 to 1991.

## **RESEARCH ACTIVITY**

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The main subjects of investigation of Dr. Laura Vergani regarded the field of Molecular and Cellular Physiology and Biophysics. During her thesis activity Dr. Vergani has investigated the role of cyclic GMP as a second messenger on light responses of the toad retina, and, more in general, the signal transduction mechanisms in invertebrate retina.

In 1987 she has begun investigating the mechanisms through which the structure of a biopolymer can modulate its function and adapt to diverse environmental conditions. By using a combination of experimental techniques ranging from cell and molecular biology, biochemistry, biophysics (calorimetry, spectroscopy, citofluorimetry, quantitative microscopy and image analysis) she studied the role of chromatin/DNA structure and nuclear architecture in regulating gene expression in mammalian cells and tissues. The published results showed that cell morphometry reflects on chromatin structure and function thus supporting a model of cellular regulation in which a flow of information sequentially connects cell morphology – nuclear architecture – chromatin structure -

gene expression. Other important results showed that structural and functional modifications of nuclear chromatin are associated to the outcome and/or progression of important genetic (Ataxia Telangiectasia) or infective (Tripanosomiasi) diseases.

Since 2001 the research activity of Dr. Vergani has been also devoted to investigate the structure/function relationship of proteins. She cloned, expressed, purified and characterized the human histone H4, the catalytic subunit of the human casein kinase 2, and different metallothioneins from aquatic organisms. The most important appreciation for her studies in this last field has been the invitation to contribute with a chapter for Volume 5 'Metallothioneins and Related Chelators' of the series Metal Ions in Life Sciences.

A prosecution of the research activity on metallothioneins has been to investigate their role as a defense mechanism against oxidative stress, with particular attention to their possible role in some physiological and pathological conditions such as hepatic steatosis, neurodegenerative diseases (Amyotrophic Lateral Sclerosis, Multiple Sclerosis), behavior disorders (Autism and Rett syndrome) or dependences /Alcohol).

Since 2008 the interest of Prof. Vergani has extended to investigate the mechanisms of regulation of lipid homeostasis in the mammalian liver both at the level of isolated hepatocytes (primary cultured rat hepatocytes or immortalized cell lines, such as FaO and MH1C1 cells) and at the level of whole organ. In particular, the mechanisms of action of thyroid hormones and their derivatives (T2) in preventing and improving the liver steatosis in rat has been investigated. In the last years the study has been extended to the hepatoprotective effects of some natural compounds as polyphenols.

#### **GRANT SUPPORT AS PRINCIPAL INVESTIGATOR**

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*CNR: Programma CNR 5% -Biomolecole per la salute* "Espressione, purificazione e caratterizzazione strutturale della CK2 umana" Anno 2000/2001 (Lire 60.000.000)

*Ateneo di Genova: Progetto di Ricerca di Ateneo* "Morfologia nucleare e struttura-funzione della cromatina" Anno 2000. (Lire 13.040.000)

*Ateneo di Genova: Progetto di Ricerca di Ateneo* 'Effetto di campi magnetici a bassa frequenza sulla struttura-funzione della cromatina nucleare' Anno 2000. Lire 13.073.000

*CNR: Programma CNR 5% -Biomolecole per la salute* "Espressione, purificazione e caratterizzazione strutturale della CK2 umana" Anno 2001/2002. Lire 50.000.000

*Ateneo di Genova: Progetto di Ricerca di Ateneo* "Alterazioni della struttura della cromatina e dell'architettura nucleare in linee cellulari linfoblastotidi isolate da pazienti affetti da Ataxia Telangiectasia" Anno 2001. Lire 15.000.000

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Caratterizzazione struttura/funzione di metallotioneine di organismi acquatici” Anno 2002. Euro 8.500

*CNR: Programma CNR 5% -Biomolecole per la salute* “Espressione, purificazione e caratterizzazione strutturale della CK2 umana” Anno 2003/2004. Euro 20.000

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Il sistema metalli/metallotioneine nella sindrome autistica” Anno 2006. Euro 8.078

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Stress ossidativo ed induzione dell’espressione delle metallotioneine nel sistema nervoso centrale di topi con encefalo mielite sperimentale autoimmune” Anno 2008. Euro 4000

*Fondazione CARIGE:* “Studio del potenziale terapeutico e dell’attività antiinfiammatoria ed antiossidante di cellule staminali mesenchimali in modelli animali di malattie degenerative del sistema nervoso centrale” Anno 2010. Euro 20.000

*Compagnia San Paolo di Torino:* “Patologia alcolica: livelli di metallotioneine e stress ossidativo nel sangue di pazienti come potenziale marker di epatopatia alcolica” Anno 2011. Euro 80.000 Euro

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Attività immunomodulante di cellule staminali mesenchimali umane: modulazione dell’espressione di molecole di adesione coinvolte nell’extravasazione linfocitaria” Anno 2011. Euro 3.000

*Associazione Italiana Sindrome di Rett (AIR):* “Studio dell’eterogeneità clinica in un’ampia coorte di pazienti con sindrome di Rett mediante un approccio biochimico-molecolare” Anno 2011-2013. Euro 8000

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Attività immunomodulante di cellule staminali mesenchimali umane: modulazione dell’espressione di molecole di adesione coinvolte nell’extravasazione linfocitaria” Anno 2011. Euro 5.000

*Ateneo di Genova: Progetto di Ricerca di Ateneo* “Studio di molecole naturali con possibile azione anti-steatosica ed antiossidante in sistemi in vitro di steatosi epatica” Anno 2013. Euro 4500

*Istituto Biochimico Italiano:* Contributo per ricerca su “Proprietà antiossidanti ed antisteatogene della silibina” Anno 2016. Euro 2000

*GNOSIS SpA:* Contributo per ricerca su “SAME fitato nel trattamento della steatosi epatica”. Anno 2017. Euro 8.000

*GNOSIS SpA:* Contributo per ricerca su “SAME fitato nel trattamento della steatosi epatica”. Anno 2018. Euro 10.000