# SILVIA GARAVAGLIA

## PERSONAL DATA

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| Date and place of birth | Cuggiono (MI), 25-12-1975 |
| Address Home | Pavia |

## BIO AND EDUCATION

- **Since December 2013:** Confirmed Assistant Professor in the field Scientific-Disciplinary BIO10-Biochemistry.
- **Since December 2010:** Assistant Professor in the field Scientific-Disciplinary BIO10-Biochemistry.
- **June 2010**: Participation in "42nd course in International School of Crystallography: STRUCTURE AND FUNCTION FROM Macromolecular Crystallography: ORGANIZATION IN SPACE AND TIME" Ettore Majorana Foundation and Centre for Scientific Culture, Erice.
- **February 2009**: Appointed Teaching Assistant for Biochemistry SSD (BIO10) at the Faculty of Pharmacy of the University of Eastern Piedmont "Amedeo Avogadro".
- **September 2008**: Participation in the "9th International School on Crystallography of Biological Macromolecules", Villa Erba, Como.
- **January 2003**: PhD in Genetics and Biochemistry, University of Pavia. The three-year activity was carried out at the Laboratory of Biocrystallography the Department of Genetics and Microbiology, University of Pavia.
- **November 2001**: Passing the state exam to practice the profession of biologist and registration with the National Association of Biologists
- **May 2001**: Participation in the "6th International School on Crystallography of Biological Macromolecules", Villa Erba, Como.
- **October 1999**: Graduation in Biological Sciences, "summa cum laude", University of Pavia.
- **July 1994**: Award of Diploma in Chemical Biology at the "Istituto Tecnico Commerciale" Castano Primo (MI). Italy. Rating: 60/60.
- **June 1993**: Activities of professional training as a lab technician for clinical biochemistry at the Blood Transfusion Centre of the Hospital "G. Fornaroli "Magenta (MI). Italy.

## UNIVERSITY CAREER

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| 2013-*today* | Confirmed Assistant Professor in the field Scientific-Disciplinary BIO10-Biochemistry |
| 2010-2013 | Assistant Professor in the field Scientific-Disciplinary BIO10-Biochemistry. |
| 2006 | Research as visiting-scientist/Post-Doc at the Department of Molecular Biology, University of Bergen, Norway. |
| 2002-2010 | Research as a Fellow of the University of Piemonte Orientale. |
| 1999-2002 | Research activities aimed at achieving the PhD in "Genetic and Biomolecular Sciences" at University of Pavia. |
| 1999<br>(3 months) | Research fellow, Istituto Mario Negri, Milano. |
| 1997-1999 | Research activities involving the preparation of thesis of Biological Sciences to CNR in Pavia. |

## UNIVERSITY POSITIONS

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| 2016 | Member of Commissione Ricerca, Dipartimento di Scienze del Farmaco Università del Piemonte Orientale |
| 2015 | Member of Commissione Biblioteca, Dipartimento di Scienze del Farmaco Università del Piemonte Orientale |
| Since October 2014 | Assistant Professor in teaching course "Clinical Biochemistry" equal to 5 CFU (40 teaching hours) during Degree in Pharmacy, Università del Piemonte Orientale. |
| Since October 2011 | Assistant Professor in teaching course "Structural Biology" equal to 5 CFU (40 teaching hours) during Degree in Chemistry and Pharmaceutical Technology and Degree in Pharmacy, Università del Piemonte Orientale. |

## SCIENTIFIC POSITIONS

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| 2015 | Member of Editorial Board of journal titled "Advances in Bioinformatics" |

## MAIN FIELDS OF INTEREST

1. High-yield expression of recombinant proteins in heterologous systems (bacteria, yeast and mammalian cells)
2. Protein Purification
3. Enzymology
4. Protein-protein interactions
5. Proteins Crystallization
6. Analysis of the three dimensional structure of proteins.
7. Structure-functions protein relationship
8. Study of Enzymes involved in NAD (P) homeostasis in humans and pathogens, in particular in *Mycobacterium tuberculosis* and *Plasmodium falciparum*.

## CURRENT ISSUES OF RESEARCH

1. The common theme of Dott.sa Silvia Garavaglia researchs, is the analysis of relationship between the enzymes structure and function. Structural biology is the heart of the research and it is integrated with an in-depth analysis of biochemistry and enzyme kinetics. These searches are also intended to develop assays suitable for procedures of ''high-throughput screenings '' in vitro, and to the identification of enzyme inhibitors through in- silico methods and in particular of rational design driven by the structural data.

2. The main line of research active, which Silvia Garavaglia has worked steadily since the beginning of her scientific research career, is on the biochemistry and enzymology of NAD (P) homeostasis in different organisms in an evolutionary framework. In this context, the subject of biochemical and structural studies, are many of the enzymes involved in the NAD (P) metabolism in bacteria, in particular *Mycobacterium tuberculosis,* in humans and, in pathological processes such as cancer, neurodegeneration and host-pathogen interaction in malaria.

3. A second line of research concerns the structural and biochemical studies of an enzyme which uses NAD+. The aldehyde dehydrogenase 1A3 is a retinaldehyde with a detoxifying action, that recent studies have seen to be over-expressed in neuroblastoma CSCs. The goal of this project is to synthesize compound that are able to bind the isoenzyme, designed on the basis of crystallographic structure. The selected molecules must be specific for the target and fluorescent. The molecules that fit this description will be tested for effectiveness and sensitivity in tracing HGG cells in various types of biological samples.

## CURRENT FUNDED PROJECTS

| PROGRAMME | FUNDED PROJECT |
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| Ricerca di Ateneo 2015 | "SINTESI E VALIDAZIONE DI UNA SONDA FLUORESCENTE PER IDENTIFICARE PRECOCEMENTE *IN VIVO* LA PRESENZA DI CELLULE CANCEROSE STAMINALI DEI NEUROBLASTOMI NEL CIRCOLO SANGUIGNO" |

## TOP FIVE PAPERS


1. Marletta AS, Massarotti A, Orsomando G, Magni G, Rizzi M, **Garavaglia S**. *Crystal structure of human nicotinic acid phosphoribosyltransferase.* FEBS Open Bio. **2015** May 7;5:419-28.
2. **Garavaglia S**, Bruzzone S, Cassani C, Canella L, Allegrone G, Sturla L, Mannino E, Millo E, De Flora A, Rizzi M. (**2011**). *The high-resolution crystal structure of periplasmic Haemophilus influenzae NAD nucleotidase reveals a novel enzymatic function of human CD73 related to NAD metabolism*. Biochem J., 441(1), 31-41.
3. **Garavaglia S**, Perozzi S, Galeazzi L, Raffaelli N, Rizzi M. "*The crystal structure of human alpha-amino-beta-carboxymuconate-epsilon-semialdehyde decarboxylase in complex with 1,3-dihydroxyacetonephosphate suggests a regulatory link between NAD synthesis and glycolysis." FEBS J.* 2009 Nov; 276(22): 6615-23.
4. Rossi F, **Garavaglia S,** Giovenzana GB, Arcà B, Li J, Rizzi M. "*Crystal structure of the Anopheles gambiae 3-hydroxykynurenine transaminase.*" *Proc Natl Acad Sci U S A.* 2006 Apr 11;

103(15): 5711-6.
5. **Garavaglia S**, Raffaelli N, Finaurini L, Magni G, Rizzi M. *A novel fold revealed by Mycobacterium tuberculosis NAD kinase, a key allosteric enzyme in NADP biosynthesis.* J Biol Chem. (2004) Sep 24; 279(39): 40980-6.