RANIERI ANTONIO

RESEARCHER CODES

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EDUCATION AND TRAINING

10 Feb. 2004 PhD in Chemistry – Department of Chemistry, University of Modena and Reggio Emilia (Italy); Supervisors: Prof. M. Borsari, Project: Redox processes involving metalloproteins or polypeptides-metal ion complexes. Redox potential determination and thermodynamics characterization. Relationship between structure and thermodynamic parameters.
24 Mar. 2000 Master Degree in Chemistry – Department of Chemistry, University of Modena and Reggio Emilia (Italy); Supervisor: Prof. M. Borsari. Project: Redox thermodynamics of interacting metalloproteins.

CURRENT POSITION

From Nov. 2015 – Associate Professor of Inorganic Chemistry (CHEM-03/A), University of Modena and Reggio Emilia (Italy).

PREVIOUS POSITIONS

2005-2015 Assistant Professor of Physical Chemistry (CHIM/02), University of Modena and Reggio Emilia (Italy).
2000-2004 Fellows working on projects entitled: “Bio-stabilization processes of fermentative matrix of selected enzymatic mixtures” (AMEK-Ferrara, Italy) supervisor: Prof. M. Borsari (University of Modena and Reggio Emilia), “Redox thermodynamics of metalloproteins” (University of Modena and Reggio Emilia, Italy) supervisor: Prof. M. Borsari (University of Modena and Reggio Emilia), “Electrochemical and potentiometric studies of metal complexes in organic fertilizers” (University of Bologna, Italy) supervisors: Prof. M Sola (University of Modena and Reggio Emilia) and Prof. C. Ciavatta University of Bologna.

RESEARCH EXPERIENCES ABROAD

May-Jun 2013: Visiting scientist, “LaserLAB” Amsterdam, Vrije Universiteit, Amsterdam (Netherland), Prof. F. Ariese.
Oct-Nov 2007: Visiting scientist, "Laser Centre", Vrije Universiteit, Amsterdam (Netherland), Prof. G. van der Zwan.
Feb-Mar 2006: Visiting scientist, "Laser Centre", Vrije Universiteit, Amsterdam (Netherland), Prof. G. van der Zwan.
Oct-Nov 2003: Visiting scientist, Bioinorganic Chemistry Laboratory - Department of Chemistry, University of Oxford, Oxford (Great Britain), Prof. A. Hill.
Jun 2002: Visiting scientist, Molecular Electrochemistry Laboratory- Departement de Chimie, École Normale Supérieure de Paris, Prof. C. Amatore.

RESEARCH INTERESTS AND ONGOING COLLABORATIONS

Electrochemical characterization of metalloproteins in solution and adsorbed phase, analysis of the electron transfer process under different physical-chemical conditions, presence of unfolding agents and, interaction with exogenous molecules. Evaluation of the role of "strategic" amino acids, of the localized charges, of the hydrogen and hydrophobic bonds on the E°’ value through the study of genetically mutated proteins. Determination of thermodynamic and kinetic parameters, development of interpretative models. Characterization/improvement of bio-catalytical processes due to native or suitably mutated proteins adsorbed on SAM or directly on the conductor.
Study of reduction and/or oxidation processes of organic molecules and metal ion complexes, mainly of biological interest. Characterization of equilibria in solution and determination of thermodynamic parameters with particular attention to the mechanisms and energetics of the ET processes.

COLLABORATIONS

- Dr. C. Tavagnacco, ET protein electrochemistry (Department di Chemical Sciences, University of Trieste, Italy)
- Prof. A. Lombardi, metallo-peptides synthesis and characterization (Department of Chemistry, University of Naples “Federico II”, Italy)
- Prof. F. Maran and Prof. S. Antonello, metal nanocluster synthesis and characterization (Department of Chemistry, University of Padova, Italy)
- Prof. V. Sergo and Prof. A. Bonifacio, spectroscopic techniques for protein characterization (CENMAT, University of Trieste, Italy)
- Prof. P. Hildebrandt, spectroscopic techniques for protein characterization (Department of Chemistry, Technische Universitat Berlin, Germany)
- Prof. J. Cowan, metalloproteins and molecular biology (Department of Chemistry, The Ohio State University, USA)
- Prof. G.W. Canters, metalloproteins characterization and molecular biology (Department of Chemistry, Leiden University, Netherland)

- Dr. F. Del Monte, molecular determinants of pathogenic mutations (Department of Medicine, Medical University of South Carolina, USA)
- Prof. I. Daidone, PMM/MD approach to investigate electron transfer proteins (University of L'Aquila, Italy)

TEACHING AND DISSEMINATION

Teaching activity as associate professor:
2023 - ongoing Inorganic general Chemistry – Master degree in Chemistry and Pharmaceutical Technologies
2015 - ongoing Nanobiotechnology - Master degree in Industrial Biotechnology
2019 - 2021 Bioelectrochemistry - Master degree in Industrial biotechnology
2015 - 2022 Inorganic Chemistry - Master degree in Food and Agricultural Science and Technology
2018 - 2021 General chemistry laboratory - Master degree in Biotechnology
2018 - 2019 General chemistry laboratory - Master degree in Biology

Teaching activity as assistant professor:

2012 - 2014 - Environmental physical chemistry – Master Degree in Environmental Science
2010 - 2013 - Physical chemistry of complex systems – Master degree in Chemistry
2005 - 2009 - Teaching of physical chemistry with laboratory – Specialization school for secondary teaching
2005 - 2009 - Solid state physical chemistry – Degree in Geological sciences

ORGANIZATION OF SCIENTIFIC MEETINGS

1) GEI-ERA 2010 - Giornate dell'Elettrochimica Italiana Elettrochimica per il Recupero dell'Ambiente" – Annual Congress of the Electrochemistry Division of the Italian Society of Chemistry (Modena, Italy, 5-10 September 2010);
2) The International Workshop on Protein Electron Transfer: from Fundamentals to Applications for Health (Modena, Italy, October 2013).

DISSEMINATION

Lectures at conferences and invited seminars: 23, 3 as invited speaker.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

More than 55 Master students (either as Supervisor or Co-Supervisor). Tutor 1 PhD Student.

BIBLIOMETRIC INDICATORS (july 2024)

h-index: 25 (Scopus), 26 (Scholar)
Papers in peer reviewed journals: 74
Total citations: 1611 (Scopus), 1852 (Scholar)

MAIN RESEARCH GRANTS AND AWARDS

2023 - PRIN 2022 - Engineering Functional Metal Nanocluster-Protein Architectures for Bio(sensing and catalytic) applications (ProNano4Bio), protocol 2022RSXC9X. € 71.442 (for research unit in UNIMORE). Principal Investigator of UNIMORE unit.
2019 - PRIN 2017 - Mineral reactivity, a key to understand large-scale processes: from rock forming environments to solid waste recovering/lithification, protocol 2017L83S77_004. € 63.220 (for research unit in UNIMORE). Participant in UNIMORE unit.
2013 - LASERLAB-EUROPE. Integrate Initiative of European Laser Infrastructures. 7th Framework programme of European Union: How does a small protein become catalytically active? Probing the molecular bases of this process with a spectroelectrochemical analysis, protocol LLAMS001927. € 7.000. Principal investigator.
2009 - PRIN 2009 - Trasferimento elettronico e proprietà elettrocatalitiche di cupredossine e citocromi immobilizzati su superfici funzionalizzate destinate alla biosensoristica e alla biocatalisi, protocol 20098Z4M5E_002. € 40.000 (for research unit in UNIMORE). Participant in UNIMORE unit.
2008 - Fondazione Cassa di Risparmio di Modena: Superfici nanostrutturate per dispositivi del tipo "Lab-on-a-Chip", protocol: 1297.08.8C. € 103.707. Participant.
2007 - LASERLAB-EUROPE. Integrate Initiative of European Laser Infrastructures. 7th Framework programme of European Union: Spectroelectrochemical study of the urea induced unfolding of cytochrome c adsorbed on self-assembled monolayers on silver, protocol LCVU001363. € 6.000. Principal investigator.
2007 - PRIN 2007 - Trasferimento elettronico e termodinamica redox di citocromi adsorbiti su superfici funzionalizzate per sensoristica e biocatalisi, protocol 20079Y9578_002. € 30.000 (for research unit in UNIMORE). Participant in UNIMORE unit.
2006 - EdRox: Marie Curie Research Training Network for young researchers. Training and research in redox enzymology, protocollo: MRTN-CT-2006035649. € 150.000. Participant.

2006 - LASERLAB-EUROPE. Integrate Initiative of European Laser Infrastructures. 7th Framework programme of European Union: Spectroelectrochemical study of the alkaline transition of cytochrome c adsorbed on self-assembled monolayers, protocollo LCVU001112. € 6.000. Principal investigator.
2016, 2017, 2020, 2021, 2022 - University of Modena and Reggio Emilia, FAR (Fondo di Ateneo per la Ricerca) projects approved as principal investigator or participant.

Modena, 22/07/2024