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CONTACTS

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UNIMORE web page

EDUCATION and TRAINING

- Degree in Chemistry, University of Modena and Reggio Emilia, July 19, 2002.
- PhD in Chemistry, University of Modena and Reggio Emilia, February 2006. Title of the dissertation: "Engineered redox metalloproteins for biotechnological applicationsA". Supervisor: Prof. Marco Sola.
- Post-Doctoral Fellow, National Research Centre CNR-INFM S3, January 2006- December 2007, working on a project entitled: "Molecular Biology and Electrochemistry of Redox Metalloproteins". Supervisor: Dr. Paolo Facci.

RESEARCH EXPERIENCE ABROAD

- Visiting student, Gorlaeus Laboratories, Leiden Institute of Chemistry, University of Leiden, The Netherlands, September-December 2003 "Construction of the expression systems on pET vectors of K27C, K27C/H117G and N42C/H117G mutants for Azurin from *P. aeruginosa*"
- Visiting fellow, Howard Huges Medical Institute, Department of Biochemistry, Brandeis University, Brandeis (MA), U.S.A. March-April 2006 "Structure and function investigations of ion channels and transporters"
- Visiting fellow, Center for Atomic-scale Materials design, DTU Technical University of Denmark, Lyngby, Denmark November-December 2010 "Computational design of Co/Ag alloys for fuel cells applications"
- HPC Europa Visiting fellow, Department of Physics and Astronomy, UCL University College London, Londra, UK May-July 2012 "Electron transfer in multi-heme proteins"
- Visiting Research fellow, Beth Israel Deaconess Medical Centre, The Harvard Medical School, Boston (MA), U.S.A. July-September 2014 "(Un)phosphyrylated cofilin-2 and its interaction with actin"

RESEARCH INTERESTS

- Demonstration of organic electronics and amperometric biosensors for the detection of biomarkers and pathogens in biological fluids.
- Developement of organic electronic devices for investigating biological processes

- Combined experimental (protein chemsitry, surface modification, protein electrochemistry) and computational (MD and QM/MM) approach to elucidating electron transfer processes in biology, with a particular focus on the dynamics/function relationship in redox proteins.

FUNDED PROJECTS

Ongoing Projects:

• Project title: **Demonstration of an Organic Bioelectronics sensing platform for the detection of AntiDrug Antibodies** (ADAs) *Funding agency*: Fondazione di Vignola (Principal Investigator: C.A: Bortolotti). The vision of this project is the demonstration of a sensing platform for the assessment and screening of the immune reaction against a biological drug (Adalimumab), a human anti TNF-alpha monoclonal antibody that exerts an anti-inflammatory effect by specifically neutralizing TNF-alpha. The aim is to quantify the presence of ADAs in test solutions and human plasma.
• Project title: **Antidrug-antibody and drug Molecular detection in Inflammatory diseases with organic electronics platform** *Funding agency*: EuroNanoMed III JTC2017 (Participant in the UNIMORE unit; Project Coordinator and UNIMORE Principal Investigator: F. Biscarini). The vision of this project is is a nanoscale platform for the assessment of the immune reaction against biologicals targeted to inflammatory pathologies. RA and SLE are taken as prototype diseases; anti-TNF-α infliximab and Lupuzor as prototype drugs, respectively. The envisioned AMI platform measures ADAs and drug levels in plasma samples.
• Project title: **Scanning probe microscopies for nanoscale fast tomographic and composition imaging SPM2.0** *Funding agency*: European Commission - Marie Curie European Training Network (Participant in the UNIMORE unit; P.I. Prof. Gabriel Gomila, Fundacio Institut de Bioenginyeria de Catalunya). The objective of the SPM2.0 European Training Network is to train a new generation of researchers in the science and technology of novel Scanning Probe Microscopes, in order to enforce their further development and quick commercialization and implementation in public and private research centers.
• Project title: **Deciphering immune response to checkpoint inhibitors and finding novel biomarkers in melanoma**. *Funding agency*: University of Modena and Reggio Emilia (Co-P.I.; Project Coordinator: Andrea Cossarizza).

Recently completed Projects:

• Project title: **Disposable point-of-care device for monitoring inflammatory biomarkers.** *Funding agency*: Italian Ministry of Foreign Affairs - Joint research projects of Particular Relevance for Scientific Cooperation between Italy and Sweden (Participant, P.I. Prof. Fabio Biscarini - UNIMORE) Assessing and monitoring the development of inflammatory processes is of paramount importance in patients affected by infections, tissue injuries as well as neoplastic growth or immunological disorders. The vision of the “Poincarè” project is the development and demonstration of an inexpensive, label free organic bioelectronic device, enabling point-of-care detection of biomarkers for inflammation.
• Project title: **Prediction of optical properties of dyes and application for the rational design of time-temperature integrators.** *Funding agency*: European Commission - FP7 Factories of the Future Resources, Technology, Infrastructure and Services for Simulation and Modelling (P.I. of UNIMORE Research Unit;. The goal of the experiment is to accelerate the selection of materials and prototyping of label architecture by

offering access to HCP-cloud based predictive simulation of optical properties of dyes, based on the combined use of quantum chemistry calculations and molecular dynamics simulations, usable with little or no experience in molecular modelling.

• Project title: **I-ONE: Implantable Organic Nano Electronics** *Funding agency*: European Commission - FP7 Collaborative Project (Participant; P.I. Prof. Fabio Biscarini, UNIMORE) The vision of iONE FP7 project is to develop and test for the first time flexible organic electronics for the development and testing of Active Multifunctional Implantable Devices (AMIDs) leading to treatment of Spinal Cord Injury (SCI).

• Project title: **Investigating the effects of dynamics on the functionality of polysaccharide monooxygenases**. *Funding agency*: Italian Supercomputing Computational Resources Allocation ISCRA (Principal Investigator).

• Project title: **Investigation of the effects of protein/solvent interaction on biological electron transfer**. *Funding agency*: Italian Supercomputing Computational Resources Allocation ISCRA (Principal Investigator).

• Project title: **Investigation of the effects of post-translational phosphorylation on human cofilin**. *Funding agency*: Italian Supercomputing Computational Resources Allocation ISCRA (Principal Investigator).

• Project title: **Electron Transfer in Multiheme Proteins**. *Funding agency*: European Commission, FP7 High Performance Computing-HPC Europa 2 (Principal Investigator as Winner of a grant for research visit opportunities.

• Project title: **An Integrated Theoretical/experimental approach to the study of electrochemical processes in fuel cells**. *Funding agency*: Italian Ministry of Education, University and Research (MIUR) - Projects of Relevant National Interest PRIN 2008 (Participant; Project Coordinator: M.L. Foresti, University of Florence).

TALKS AT CONFERENCES

- 1st ECHEMS Meeting Electrochemistry in Nanosciences, San Servolo (Venezia), June 30 –July 3, 2005.
- XXXIII National Congress of the Division of Inorganic Chemistry, Italian Society of Chemistry, Siena, July 11-16, 2005.
- 5th Chianti Meeting on Inorganic Electrochemistry, Certosa di Pontignano, Siena (Italy), July 8-13, 2008.
- GEIERA 2010 Giornate dell'Elettrochimica Italiana, Modena (Italy), September 5-10, 2010.
- ESF Conference "Electron Transfer in Biological Systems", Obergurgl (Austria), July 17-22, 2011.
- National Congress of the Division of Chemistry of Biological Systems, Italian Society of Chemistry, Napoli (Italy), September 24-25, 2012.
- 6th Central European Conference "Chemistry Towards Biology", Trieste (Italy), September 10-13, 2013
- MRS 2014 (Materials Research Society) Fall Meeting, Boston (MA), U.S.A., November 30-December 5, 2014.
- **Invited Speaker** at the 9th International Conference Structure and Stability of Biomacromolecules, Kosice (Slovakia) June 30- July3, 2015.
- 1st European Conference on Physical and Theoretical Chemistry, Catania (Italy) September 14-18, 2015.
- ICOE 2016 The 12th International Conference on Organic Electronics, Bratislava (Slovakia), June 13-15, 2016.
- 3rd Workshop on Surfaces, Interfaces and Functionalization Processes in Organic Compounds and Applications, SINFO III, Naples (Italy), June 27-29, 2016.
- **Invited Speaker** at the conference "Bioelectronics and Biosensors" London (UK), November 17-18, 2016.
- E-MRS (European Material Research Society) Spring Meeting 2017, Strasbourg (France), May 22-26, 2017.
- **Invited Speaker** (Keynote Talk) at "Orbitaly 2017 – Organic Bioelectronics in Italy", Cagliari (Italy), October 25-27, 2017.
- **Invited Speaker** at "Nanoinnovation 2017", Roma (Italy), September 26-29, 2017.
- **Invited Speaker** at Hirschegg Winter School on Biophotonics and Bioelectronics, Hirschegg (Austria),

February 18-24, 2018.
- **Invited Speaker** at Smell Sensing Workshop, Tulln (Austria), April 16-18, 2018.

INVITED SEMINARS

- Invited seminar at the Center for Molecular Biophysics of the Oak Ridge National Laboratory, Tennessee (U.S.A.). Title of the seminar: " Combining electrochemistry and Perturbed Matrix Method calculations to investigate ET proteins". September 8, 2014.
- Invited seminar (Periodical Series of Lectures) at the Materials Research Institute of Barcelona (ICMAB-CSIC). Title of the seminar: " Proteins at surfaces: strategies for exploring the biological world and for developing nanobiotechnological applications". July 4, 2016.
- Invited seminar at the Institut de Science et d'Ingénierie Supramoléculaires (ISIS), Université de Strasbourg (France). Title of the seminar: "Biosensing with organic electronic transistors" March 23, 2018.
- Invited seminar at the Institute for Bioengineering of Catalonia (IBEC) in Barcelona (Spain). Title of the seminar: "Monitoring biorecognition with organic bioelectronic transistors". March 20, 2018.

OTHER ATTENDED CONFERENCES AND SCHOOLS

- 4th Sigma Aldrich Young Chemists Symposium, Riccione, 17-19 My 2004 (poster presentation)
- XXXII National Congress of the Division of Inorganic Chemistry, Italian Society of Chemistry, Roma, 20-24 September 2004 (poster presentation)
- 5th ECHEMS Meeting "Electrochemistry in Functional Molecules and Materials", Weingarten (Germany), 7-10 June 2009 (poster presentation)
- XXIII National Congress of the Italian Society of Chemistry, Sorrento, 5-10 July 2009 (poster presentation)
- 6th ECHEMS Meeting "Electrochemistry in Interfacial Nanoscience", Sandbjerg (Denmark), 20-20 June 2010 (poster presentation)
- Chemical Biology 2010, Heidelberg (Germany), 22-25 September 2010 (poster presentation)
- CCP-BioSim conference, Frontiers of Biomolecular Simulation, Cirencester (UK), 27 June 2012
- International School of Solid State Physics "61th Workshop-Bioelectronics: Principles, Materials and Processes", Erice (Sicily), 1-9 May 2014 (poster presentation)

REVIEWING AND SCIENTIFIC COMMITTEES ORGANIZING ACTIVITIES

Serving as a reviewer for the following journals: The Journal of the American Chemical Society, Chemical Reviews, Physical Chemistry Chemical Physics, The Journal of Physical Chemistry, Advanced Materials, Scientific Reports, Biochimica Biophysica Acta, Life Sciences, Sensors.

Serving as a reviewer for the Swiss National Science Foundation and for the Italian Super- Computing Resource Allocation - ISCRA

Member of the Organizing Committee of the following conferences:

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);

3) The 10^{th} International Conference on Organic Electronics - ICOE (Modena, Italy, June 2014);

4) Orbitaly 2015: Organic Bioelectronics in Italy, from Biosensors to Neuronal Interfaces (Modena, Italy, September 2015);