

CARLO AUGUSTO BORTOLOTTI

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CONTACTS

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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 10, 2006. Title of the dissertation: "Engineered redox metalloproteins for biotechnological applications". 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

- 02/2019-03/2019, Austrian Institute of Technology, Tulln an der Donau (Austria).
- 07/2014-09/2014, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston (U.S.A.).
- 05/2012-07/2012, HPC Europa Visiting fellow, Department of Physics and Astronomy, UCL University College London (UK).
- 11/2010-12/2010, Center for Atomic-scale Materials design, DTU Technical University of Denmark, Lyngby, (Denmark).
- 02-30/03/2006, Howard Hughes Medical Institute, Department of Biochemistry, Brandeis University, Brandeis (MA), U.S.A.
- 09/2003-12/2003, Gorlaeus Laboratories, Leiden Institute of Chemistry, University of Leiden (The Netherlands).

RESEARCH INTERESTS

- Demonstration of organic electronics biosensors for the detection of biomarkers and pathogens in biological fluids.
- Development of organic electronic devices for investigating biological processes
- Combined experimental (protein chemistry, 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.

BIBLIOMETRIC INDEXES

H-index: 27 (SCOPUS)

Total citations: 2495 (SCOPUS)

Total number of publications on peer-reviewed journals: 97

FUNDED PROJECTS

Ongoing Projects:

2022-Current

European Union—NextGeneration EU through Italian Ministry of University and Research under Piano Nazionale Ripresa e Resilienza

Role: Spoke Co-Leader

Title: Health Extended Alliance for Innovative Therapies, Advanced Lab research, and Integrated Approaches for Precision Medicine (HEAL ITALIA)

UNIMORE Budget: 7,315,000 €

2022-Current

Fondo di Ateneo per la Ricerca (FAR 2021), Progetti di ricerca interdisciplinari mission oriented, University of Modena and Reggio Emilia

Role: PI

Title: P-Tau Diagnostics of Alzheimer's Disease with Label Free Organic Transistors (P-DOT)

73.680 €

2020-Current

Ministero dell'Università e della Ricerca through PRIMA Partnership for Research and Innovation in the Mediterranean Area – Supported by Horizon 2020.

Role: Participant

Title: Sustainable technologies and methodologies to improve quality and extend product shelf life in the Mediterranean agro-food supply chain (FRUALGAE)

UNIMORE budget: 350,000 €

2020-Current

Horizon 2020 - Marie Skłodowska-Curie Research and Innovation Staff Exchange, Grant Agreement n. 872217

Role: Participant

Title: Optimization of novel value chains for fish and seafood by developing an integrated sustainable approach for improved quality, safety and waste reduction (ICHTHYS)

Total budget: 1,007,400 €; UNIMORE budget: 105,800 €.

Recently completed Projects (last 5 years):

2019-2023

Horizon 2020 - Marie Skłodowska-Curie European Training Network (H2020-MSCA-ITN-2018) Grant Agreement n. 813863.

Role: Coordinator

Title: Biosensing with organic electronics (BORGES)

Total budget: 3,979,589.40 €; UNIMORE budget: 522,999.36 €

2020-2023

Italian Ministry of Foreign Affairs and International Cooperation – Scientific Call 2020, Industrial, scientific and technological cooperation between Italy and Israel.

Role: PI for the Italian unit

Title: Green fabrication of an all-protein-based flexible electronic device for biosensing application (GREEN-ALP)
200.000 €

2021-2022

Italian Ministry of Health

Role: Participant

Title: Development of EGOFET biosensors for high sensitivity detection of doping substances.
105,891.62 €

2017-2020

Horizon 2020 - Marie Skłodowska-Curie European Training Network, Grant Agreement n. 721874.

Role: Participant

Title: Scanning probe microscopies for nanoscale fast tomographic and composition imaging (SPM2.0).

Total budget: 3,593,489 €; UNIMORE budget: 258,061 €.

2018-2021

EuroNanoMed III Joint Transnational Call 2017.

Role: Participant

Title: Antidrug-antibody and drug Molecular detection in Inflammatory diseases with organic electronics platform (AMI).

Total budget: 917,240 €; UNIMORE budget: 234,000 €

2018-2019

Università di Modena e Reggio Emilia, FAR (Fondo di Ateneo per la Ricerca anno 2017 - progetti di ricerca interdisciplinari).

Role: Participant

Title: Deciphering immune response to checkpoint inhibitors and finding novel biomarkers in melanoma..

Total budget: 70,000 €

2016-2019

Fondazione di Vignola.

Role: Scientist in charge

Title: Demonstration of an electronic biosensing platform for the detection of antidrug antibodies (ADAs).

Total budget: 12,000 €

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.
- 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.
- 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 Speaker at “Bioelectrochemistry and more...” Workshop, Wiener Neustadt (Austria), May 27-29, 2018.
- XLVI National Congress of the Division of Physical Chemistry, Italian Society of Chemistry, Bologna (Italy), June 25-28, 2018.
- Invited Speaker at “Nanoinnovation 2018”, Roma (Italy), September 11-14, 2018.
- Invited Speaker at “IFSOE 2018 International Fall School on Organic Electronics – Sensor Day”, Moscow (Russia), September 16-21, 2018.
- Invited Speaker at “Bioelectrochemistry, surfaces, and more...” AIT/CEST Workshop, Tulln (Austria), February 6, 2019.
- Speaker at “Nanoinnovation 2019”, Roma (Italy), June 11-14, 2019.
- Invited Speaker at “IFSOE 2019 International Fall School on Organic Electronics”, Moscow (Russia), September 15-20, 2019.
- Invited Speaker at “Orbitaly 2019 – Organic Bioelectronics in Italy”, Naples (Italy), October 21-23, 2019.
- Invited Speaker at “Analytica 2020”, Munich (Germany), October 19-23, 2020.
- Invited Speaker at “Nanoinnovation 2021”, Roma (Italy), September 21-24, 2021.
- Invited Speaker at “78th International Workshop and 6th Orbitaly”, Erice (Italy), July 4-9, 2022.
- Invited Speaker at “8th International Winterschool on Bioelectronics (BioEI 2023)”, Kirchberg (Austria), March 11-18, 2023.
- Invited Speaker at “CMD 30 FisMat23 Conference”, Milan (Italy), September 4-8, 2023.

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 at the University of Bari “Aldo Moro” (Italy). Title of the seminar: “Functionalized surfaces for the investigation of biological electron transfer and for biosensing”. November 12, 2015.
- 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 May 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: Science, Chemical Reviews, Journal of the American Chemical Society, Advanced Materials, Biosensors and Bioelectronics, Physical Chemistry Chemical Physics, Journal of Physical Chemistry B, Scientific Reports, ACS Omega, ACS Sensors, Organic Electronics, Nanoscale, International Journal of Molecular Sciences, Life Sciences, Biochimica Biophysica Acta General Subjects, Analyst, Sensors, IEEE-Transactions on Electron Devices, ChemPlusChem.

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 10th 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).