

PERSONAL INFORMATION

Patrizia Romana Mussini



 patrizia.mussini@unimi.it

 <http://users.unimi.it/ECEA>
<https://sites.unimi.it/vince/index.php/chiral-electrochemistry/>

Sex female | Date of Birth 02/06/1963 | Nationality Italian

WORK EXPERIENCE

From April 2016

Full Professor of Analytical Chemistry (Courses: [Chimica Analitica I](#) (for Chimica and Chimica Industriale 3-year degrees); [Chimica Elettroanalitica Avanzata](#) (I module, for Scienze Chimiche 5-year degree); from academic year 2018/19 also [Metodi analitici per le biotecnologie farmaceutiche](#) (Theory B Module, for Biotecnologia 3-year degrees); in academic year 2017/18 also [Chimica Analitica](#) (module, for Chimica e Tecnologie Farmaceutiche 5-year degree); in academic year 2015/16 also charged of [Laboratorio di Chimica Analitica I](#) (module for Chimica Industriale 3-year degree)

Dipartimento di Chimica (formerly Dipartimento di Chimica Fisica ed Elettrochimica), Università degli Studi di Milano, Via Golgi 19, 20133 Milano, <http://www.chimica.unimi.it/ecm/home>

- Teaching in the above university courses and as tutor of many theses/stages for students of various academic levels
- Scientific research in the fields of electroanalysis, electrochemistry and electrocatalysis

December 2002
-March 2016

Associate Professor of Analytical Chemistry (Courses: [Chimica Analitica I](#) (for Chimica and Chimica Industriale 3-year degrees, from academic year 2003/04 to 2012/13 also charged of [Laboratorio di Chimica Analitica \(I\)](#); from 2002/03 to 2009/10 also charged of [Laboratorio di Elettrochimica](#); from 2011 also charged of [Advanced Electroanalytical Chemistry I](#) module)

Dipartimento di Chimica (precedentemente Dipartimento di Chimica Fisica ed Elettrochimica), Università degli Studi di Milano, Via Golgi 19, 20133 Milano, <http://www.chimica.unimi.it/ecm/home>

- Teaching in the above university courses and as tutor of many theses/stages for students of various academic levels
- Scientific research in the fields of electrochemistry, electroanalysis and electrocatalysis

February 1992
-November 2002

Researcher in Applied Physical Chemistry

Dipartimento di Chimica Fisica ed Elettrochimica, Università degli Studi di Milano, Via Golgi 19, 20133 Milano

- Scientific research in the fields of electrochemistry, electroanalysis and electrocatalysis
- Charged of Physical Chemistry Laboratory and Electrochemistry Laboratory courses

September 1988-January
1992

Research Technician (VIII level)

Dipartimento di Chimica Fisica ed Elettrochimica, Università degli Studi di Milano, Via Golgi 19, 20133 Milano

- Scientific research in the fields of electrochemistry, electroanalysis and electrocatalysis

November 1986- October
1988

Post-degree research activity

Dipartimento di Chimica Fisica ed Elettrochimica, Università degli Studi di Milano, Via Golgi 19, 20133 Milano

- Scientific research in the fields of electrochemistry, electroanalysis and electrocatalysis

EDUCATION AND TRAINING

- 2016 Chemometrics school at Università di Genova
- 2013 National Habilitation to Full Professor of Analytical Chemistry
- 1997 **Zentrale Mittelstufeprüfung**
German language examination at Goethe Institut Mailand
- 1986 **"Esame di Stato" (State certification exam for habilitation as professional Chemist)**
Università degli Studi di Milano
- 1981-1986 **"Laurea" (5-year Degree) in Chemistry; marks:110 of 110 *cum laude***
Università degli Studi di Milano
- 1976-1981 **"Maturità Classica" (5-year Classical High School Diploma); marks: 60 of 60**
Liceo Classico "Collegio delle Fanciulle", Milano
- 1980 **III prize national competition "Certamen Classicum Florentinum"**
Translation from Ancient Greek to Latin with critical comment
- 1979 **First Certificate of English, Grade A**
granted by University of Cambridge (local examination at British Council, Milano)

Organisational/managerial Responsible of a research laboratory; from 1989 tutor or cotutor of about 130 5- or 3-year degree theses, of several PhD theses, scholarship holders and postDoc researchers, as well as of several international exchange program students.

skills Committee member for Chemistry PhD Course, and for Chemical Science and Technology Degree Courses.

Since 2014 Coordinator of UNIMI DC committee for chemistry dissemination/motivational/updating activities particularly devoted to high schools, having previously planned, organized and/or carried out for the same committee many activity particularly for high school teachers and students. Responsible of the Chemistry PLS (Piano Nazionale Lauree Scientifiche) for Università degli Studi di Milano (AA. 2015/2016-2017/2018, AA 2018/2019).

Member of the International Society of Electrochemistry (ISE); in particular, 2004-2006 Italy's National Representative, 2009-2010 vice-Chair of the Molecular Electrochemistry Division, 2017-2018 "Chair Elect" of the same Division, becoming "Chair" in 2019-2020.

Member of the Italian Chemical Society (Divisions: Analytical Chemistry, Electrochemistry and Physical Chemistry; Interdivisional groups: Sensors and Renewable Energies); 1999-2004 member of the Electrochemistry Division Board.

Member of organizing and/or scientific committees of, or invited lecturer to, national and international conferences.

In particular, 2014- member of the Scientific Board of the ECHEMS international conference series focusing on new developments in electrochemistry. In such frame, Chair of the Organizing Committee, as well as member of the Scientific Committee, of the International Meeting XII ECHEMS "Electrochemistry in... ingenious molecules, surfaces and materials" (Italy, Milano Marittima, 6-9 June 2017), nearly 150 participants from ~25 countries..

Referee of many authoritative international scientific journals; 2013 and 2017 Special Issue Guest Editor, *Electrochimica Acta*.

2007-2009 Italian Responsible for a Poland-Italy bilateral research program (Executive Programme of Scientific and Technological Cooperation between Poland and Italy).

2011 Invited lecture at IFW Leibniz Institute for Solid State and Materials Research, Dresda, Germany.

2011-2014 Member of the International Advisory Board of the "Noblesse" ("Nanotechnology, Biomaterials and Alternative Energy Source for ERA integration") Project, EU 7th FP, Inst. of Phys. Chem. of the Polish Academy of Sciences, Warsaw, Poland (<http://www.ichf.edu.pl/noblesse/AdvisoryBoard.html>).

2013-2017 Promoter and Project coauthor of the new UNIMI DC SmartMatLab centre for advanced materials and devices at the academy/industry interface, cofunded by Regione Lombardia and Fondazione Cariplo.

2012-2016 Principal Investigator of the project "Inherently Chiral Ionic Liquids", awarded with one of the "Frontier Research in the Chemical Field" prizes by Fondazione Cariplo (Grant no. 2011-1851).

2016-2018 Principal Investigator of the project "Enhancing VINCE (Versatile Inherently Chiral Electrochemistry)" cofunded by Fondazione Cariplo and Regione Lombardia (2016-0923).

Since 2008 responsible of many projects of applied research and/or advanced training with companies and industries.

Professional Skills Electroanalysis/Electrochemistry/Electrocatalysis specialist, particularly concerning the molecular field as well as advanced and "intelligent" electroactive molecular materials.

About 180 scientific papers (H-index about 31/32), an international book chapter, several patent applications or patents and about 300 oral or poster presentations at conferences (as presenting author or coauthor). Current interests are focused on 1) molecular electroanalysis and electrochemistry for the development of innovative materials for applications in the field of sensors, optoelectronics, spintronics and energetics; in particular, inherently chiral electrodes, ionic liquids and ionic liquid additives with outstanding enantiodiscrimination ability for the enantiomers of chiral electroactive probes as well as high molecular spin filter and chiroptical activity; and, in general, new organic semiconductors, conducting polymers, luminescent complexes, molecules with multiple redox centres, and so on; 2) electrocatalytic electrodes (above all Ag and Au), for analytical, environmental and synthetic applications; 3) electroanalysis fundamentals and protocols, particularly concerning pH, electrode potentials, reference electrodes, activity coefficients, salt bridges...) in complex media including mixed solvents, ionic liquids and matrices of interest for environmental, pharmaceutical and food chemistry. Researcher ID: F-6852-2015; ORCID: 0000-0003-4063-1563.

RECENT SCIENTIFIC PUBLICATIONS (of those marked with (*) I am a corresponding Author)

- T. Benincori, S. Arnaboldi, M. Magni, S. Grecchi, R. Cirilli, C. Fontanesi, P.R. Mussini, **Highlighting spin selectivity properties of chiral electrode surfaces from redox potential modulation of an achiral probe under applied magnetic field**, *Chem. Sci.* 2019, 10, 2750-2757 (*)
- S. Arnaboldi, T. Benincori, A. Penoni, L. Vaghi, R. Cirilli, S. Abbate, G. Longhi, G. Mazzeo, S. Grecchi, M. Panigati, P. Romana Mussini, **Highly Enantioselective "Inherently Chiral" Electroactive Materials Based on the 2,2'-Biindole Atropisomeric Scaffold**, *Chem. Science* 2019, 10, 2708-2717 (*)
- M. Longhi, S. Arnaboldi, E. Husanu, S. Grecchi, R. Cirilli, S. Rizzo, C. Chiappe, P.R. Mussini, L. Guazzelli **A family of chiral ionic liquids from the natural pool: relationships between structure and functional properties and electrochemical enantiodiscrimination tests**, *Electrochimica Acta* 2019, 298, 194-209 (*)
- S. Arnaboldi, S. Cauteruccio, S. Grecchi, T. Benincori, M. Marcaccio, A. Orbelli Biroli, G. Longhi, E. Licandro, P.R. Mussini, **Thiahelicene-based inherently chiral films for enantioselective electroanalysis**, *Chem. Science* 2019, 10, 1539-1548 (*)
- D. Dova, S. Cauteruccio, N. Manfredi, S. Prager, A. Dreuw, S. Arnaboldi, P.R. Mussini, E. Licandro, A. Abbotto, **An unconventional helical push-pull system for solar cells**, *Dyes and Pigments* 2019, 161, 382-388.
- D. Dova, S. Cauteruccio, N. Manfredi, S. Prager, A. Dreuw, S. Arnaboldi, P.R. Mussini, E. Licandro, A. Abbotto, **Helical push-pull systems for solar cells: Electrochemical, computational, photovoltaic and NMR data**, *Data in Brief* 2018, 21, 2339-2349
- T. Benincori, G. Appoloni, P.R. Mussini, S. Arnaboldi, R. Cirilli, E. Quartapelle Procopio, M. Panigati, S. Abbate, G. Mazzeo, G. Longhi, **Searching for models exhibiting high circularly polarized luminescence: electroactive inherently chiral oligothiophenes**, *Chemistry-A European Journal* 2018, 24, 11082-11093
- T. Benincori, S. Gámez-Valenzuela, M. Goll, K. Bruchlos, C. Malacrida, S. Arnaboldi, P.R. Mussini, M. Panigati, J.T. López Navarrete, M.C. Ruiz Delgado, G. Appoloni, S. Ludwigs **Electrochemical studies of a new, low-band gap inherently chiral ethylenedioxythiophene-based oligothiophene**, *Electrochim. Acta* 2018, 284, 513-525
- S. Rizzo, S. Arnaboldi, R. Cirilli, A. Gennaro, A.A. Isse, F. Sannicolò, P.R. Mussini, **An "inherently chiral" 1,1'-bibenzimidazolium additive for enantioselective voltammetry in ionic liquid media**, *Electrochemistry Communications*, 2018, 89, 57-61 (*)
- S. Arnaboldi, M. Magni, P.R. Mussini, **Enantioselective selectors for chiral electrochemistry and electroanalysis: Stereogenic elements and enantioselection performance** *Current Opinion in Electrochemistry*, 2018, 8, 60-72. (REVIEW) (*)
- S. Arnaboldi, S. Grecchi, M. Magni, P.R. Mussini, **Electroactive chiral oligo- and polymer layers for electrochemical enantiorecognition** *Current Opinion in Electrochemistry*, 2018, 7, 188-199. (REVIEW) (*)
- M. Zalas, B. Gierczyk, A. Bossi, P.R. Mussini, M. Klein, R. Pankiewicz, M. Makowska-Janusik, Ł. Popenoda, W. Stampur, **The influence of anchoring group position in ruthenium dye molecule on performance of dye-sensitized solar cells** *Dyes and Pigments* 2018, 161, 335-346.
- M. Penconi, M. Cazzaniga, S. Kesarkar, C. Baldoli, P.R. Mussini, D. Ceresoli, A. Bossi, **β-Diketonate ancillary ligands in heteroleptic iridium complexes: A balance between synthetic advantages and photophysical troubles**, *Photochem. Photobiol. Sciences*, 2018, 17, 1169-1178.
- A. Poma, A. Forni, C. Baldoli, P.R. Mussini, A. Bozzi, **Cyclometalated Pt(II) complexes with a bidentate Schiff-base ligand displaying unexpected: Cis / trans isomerism: Synthesis, structures and electronic properties**, *Dalton*

Transactions **2017**, 46, 12500-12506.

- M. Penconi, M. Cazzaniga, S. Kesarkar, P.R. Mussini, D. Ceresoli, A. Bossi, **Upper limit to the ultimate achievable emission wavelength in near-IR emitting cyclometalated iridium complexes** *Photochem. Photobiol. Sciences*, **2017**, 8, 1220-1229.
- L. Viglianti, F. Villafiorita-Monteleone, C. Botta, P. R. Mussini, E. Ortoleva, C. Baldoli, E. Licandro, **A comparative study of electrochemical, spectroscopic and structural properties of phenyl, thienyl and furyl substituted ethylenes**, *Chemistry Select*, **2017**, 2, 2763-2773.
- S. Rizzo, S. Arnaboldi, V. Mihali, R. Cirilli, A. Forni, A. Gennaro, A. Ahmed Isse, M. Pierini, P. R. Mussini, F. Sannicolò, **"Inherently Chiral" Ionic-Liquid Media: Effective Chiral Electroanalysis on Achiral Electrodes**, *Angew. Chem.*, **2017**, 56, 2079-2082. (*)
- E. Quartapelle Procopio, T. Benincori, G. Appoloni, P.R. Mussini, S. Arnaboldi, C. Carbonera, R. Cirilli, A. Cominetti, L. Longhi, R. Martinazzo, M. Panigati, R. Po, **A family of solution-processable macrocyclic and open-chain oligothiophenes with atropisomeric scaffolds: Structural and electronic features for potential energy applications**, *New J. Chem.* **2017**, 41, 10009-10019.
- S. Arnaboldi, T. Benincori, R. Cirilli, S. Grecchi, L. Santagostini, F. Sannicolò, P. R. Mussini, **"Inherently chiral" thiophene-based electrodes at work: a screening of enantioselection ability toward a series of pharmaceutically relevant phenolic or catecholic amino acids, amino esters, and amine**, *Analytical Bioanalytical Chemistry*, 408(26) 7243-7254 (**2016**) (Feature article) (*)
- F. Sannicolò, P.R. Mussini, T. Benincori, R. Martinazzo, S. Arnaboldi, G. Appoloni, M. Panigati, E. Quartapelle Procopio, V. Marino, R. Cirilli, S. Casolo, W. Kutner, K. Noworyta, A. Pietrzyk-Le, Z. Iskierko, K. Bartold **Inherently Chiral Spider-Like Oligothiophenes**, *Chemistry-a European Journal* 22(31) 10839-10847 (**2016**) (*)
- D. Dova, L. Viglianti, P. R. Mussini, S. Prager, A. Dreuw, A. Voituriez, E. Licandro, S. Cauteruccio, **Tetrathia[7]helicene Phosphorus Derivatives: Experimental and Theoretical Investigations of Electronic Properties, and Preliminary Applications as Organocatalysts** *Asian J. Org. Chem.*, 5(4) 537-549 (**2016**)
- S. Kesarkar, W. Mroz, M. Penconi, Ma. Pasini, S. Destri, Ma. Cazzaniga, D. Ceresoli, P. R. Mussini, C. Baldoli, U. Giovannella, A. Bossi, **Near-IR Emitting Iridium(III) Complexes with Heteroaromatic beta-Diketonate Ancillary Ligands for Efficient Solution-Processed OLEDs: Structure-Property Correlations**, *Angew. Chem.*, 55(8) 2714-2718 (**2016**)
- S. Arnaboldi, T. Benincori, R. Cirilli, W. Kutner, M. Magni, P. Mussini, K. Noworyta, F. Sannicolò, **Inherently chiral electrodes: the tool for chiral voltammetry**, *Chemical Science* 6 (**2015**) 1706-1711 (*)
- S. Arnaboldi, R. Cirilli, A. Forni, A. Gennaro, A. Ahmed Isse, V. Mihali, P. R. Mussini, M. Pierini, S. Rizzo, F. Sannicolò, **Electrochemistry and Chirality in Bibenzimidazole Systems**, *Electrochimica Acta* **2015** 179, 250-262 (*)
- S. Arnaboldi, A. Gennaro, A. Ahmed Isse, P.R. Mussini, **The solvent effect on the electrocatalytic cleavage of carbon-halogen bonds on Ag and Au**, *Electrochimica Acta* 158 (**2015**) 427
- S. Arnaboldi, M. Magni, P. R. Mussini, A. Gennaro, A. Ahmed Isse, **"Egg of Columbus": Single-step complete removal of chloride impurities from ionic liquids by AgCl deposition on silver electrode**, *Electrochemistry Communications* 51 (**2015**) 46-49. (*)
- C. Baldoli, S. Bertuolo, E. Licandro, L. Viglianti, P. Mussini, G. Marotta, P. Salvatori, F. De Angelis, P. Manca, N. Manfredi, A. Abbotto, **Benzodithiophene Based Organic Dyes for DSSC: Effect of Alkyl Chain Substitution on Dye Efficiency** *Dyes and Pigments*, 12 (**2015**), 351-362
- F. Nastasi, F. Puntoriero, M. Natali, M. Mba, M. Maggini, P. Mussini, M. Panigati, S. Campagna, **Photoinduced intercomponent excited-state decays in a molecular dyad made of a dinuclear rhenium(I) chromophore and a fullerene electron acceptor unit**, *Photochem. Photobiol. Sci.* (**2015**), 14, 909-918.
- A. Orbelli Biroli, F. Tessore, V. Vece, G. Di Carlo, P. R. Mussini, V. Trifiletti, L. De Marco, R. Giannuzzi, M. Manca, M. Pizzotti, **Highly improved performance of ZnII Tetraarylporphyrinates in DSSC by the presence of octyloxy chains in the aryl rings**, *J. Mat. Chem. A*, **2015**, 3, 2954-2959
- F. Sannicolò, P.R. Mussini, T. Benincori, R. Cirilli, S. Abbate, S. Arnaboldi, S. Casolo, E. Castiglioni, G. Longhi, R. Martinazzo, M. Panigati, M. Pappini, E. Quartapelle Procopio, S. Rizzo **Inherently Chiral Macrocyclic Oligothiophenes: Easily Accessible Electroresponsive Cavities with Outstanding Enantioselection Performances** *Chem. Eur. J.* **2014**, 20, 15298 – 15302
- E. Quartapelle Procopio, V. Bonometti, M. Panigati, P. Mercandelli, P.R. Mussini, T. Benincori, G. D'Alfonso, F. Sannicolò, **Dinuclear Rhenium Complexes as Redox-Active Pendants in a Novel Electrodeposited Polycyclopentadithiophene Material** *J. Inorg. Chem.* **2014**, 53, 11242-11251 (*)
- G.P.M. Bignami, A. Ceriotti, P.R. Mussini, C. Oliva, G. Longoni, S. Zacchini, M. Gaboardi, M. Mazzani, M. Riccò **Comparative Investigations on Platinum Cluster Salts. Experimental characterisation of platinum carbonyl cluster salts for applications in molecular electronics**, *Johnson Matthey Technol. Rev.*, **2014**, 58, (3)

- S.Arnaboldi, A. Bonetti, E.Giussani, P.R.Mussini, T.Benincori, S. Rizzo, A. Ahmed Isse, A.Gennaro **Electrocatalytic reduction of bromothiophes on gold and silver electrodes: An example of synergy in electrocatalysis**, ELECTROCHEMISTRY COMMUNICATIONS 38 (2014) 100-103M. (*)
- M. Viganò, Fr. Ferretti, A. Caselli, . Ragaini, M. Rossi, P. Mussini, P. Macchi, **Easy Entry into Reduced Ar-BIANH₂ Compounds: A New Class of Quinone/Hydroquinone-Type Redox-Active Couples with an Easily Tunable Potential**, *Chem. Eur. J.* 2014, 20, 14451 – 14464. (*)
- M. Magni, Al.Colombo, C. Dragonetti, P. Mussini **Steric vs electronic effects and solvent coordination in the electrochemistry of phenanthroline-based copper complexes** *Electrochimica Acta* 141 (2014) 324–330.
- G. Longhi, S. Abbate, G. Mazzeo, E. Castiglioni, P. Mussini, T. Benincori, R. Martinazzo, F. Sanniccolo, **Structural and Optical Properties of Inherently Chiral Polythiophenes: A Combined CD-Electrochemistry, Circularly Polarized Luminescence, and TD-DFT Investigation** *J. Phys. Chem. C* 2014, 118, 16019–16027
- G. Di Carlo, A. Orbelli Biroli, F.Tessore, M. Pizzotti, P.R.Mussini, A.Amat, F.De Angelis, A. Abbotto, V.Trifiletti, R. Ruffo **Physicochemical Investigation of the Panchromatic Effect on β -Substituted ZnII Porphyrinates for DSSCs: The Role of the π Bridge between a Dithienylethylene Unit and the Porphyrinic Ring** *J. Phys. Chem. C* 2014, 118, 7307–7320
- F. Sannicolò, S. Arnaboldi, T. Benincori, V. Bonometti, R. Cirilli, L. Dunsch, W. Kutner, G. Longhi, P. R. Mussini, M.Panigati, M. Pierini, S. Rizzo **Potential-Driven Chirality Manifestations and Impressive Enantioselectivity by Inherently Chiral Electroactive Organic Films** ANGEWANDTE CHEMIE INT. EDN., 2014, 53, 1 – 6

PERSONAL SKILLS

Mother language Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	interaction	production	
English	good/very good	excellent	good/very good	very good	very good
	First Certificate of English, grade A (British Council)				
German	fair/good	good/very good	fair	fair	fair/good
	Deutsche Mittelstufeprüfung (Goethe Institut Mailand)				
French	very good	excellent	basic	basic	basic
Latin		excellent		basic	Very good
	1980 III national prize Certamen Classicum Florentinum (translation from Classical Greek into Latin)				
Ancient Greek		excellent			Simple sentences
	1980 III national prize Certamen Classicum Florentinum (translation from Classical Greek into Latin)				

Note: with dictionary/grammar availability, particularly for the two classical languages and for written production in all languages.

Communication skills

I am accustomed to speak in public, and to hold lessons as well as scientific seminars in Italian and in English.

I have been carried out scientific dissemination activities for many years, particularly devoted to high school students and teachers.

I am accustomed to sing in public, also as a solist, in various languages.

Computer skills

I am fluent in PC use (particularly Word, Excel, Power Point and specific software for elaboration of electrochemical data). I have taught Excel (particularly applied to scientific data elaboration) to many hundreds of students and also to many high school teachers, for whom I have organized a "Chemistry at PC" course in the official frame of MIUR's SOFIA platform.

Hobbies

Classical disciplines (particularly history, literature in various ancient and modern languages, art, civilization and costume from antiquity to XIX century)

Classical music, particularly opera singing as well as polyphony (I am the codirector of an amateur four-voice choir with a repertory spreading over many centuries)

Artistic drawing

Word puzzles

Driver Licence

B Driver Licence

