
BIOGRAPHICAL SKETCH

NAME: Enrico Monzani

POSITION TITLE: Full professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Università degli Studi di Milano, Milano, IT	L	1991	Industrial Chemistry, bioinorganic chemistry
Mario Negri Institute for Pharmacological Research, Milano, IT		1992	Enzymology, peptide synthesis
Università degli Studi di Pavia, Pavia, IT	PhD	1994	Bioinorganic Chemistry

A. Personal Statement

Enrico Monzani is a full professor in General and Inorganic Chemistry at the University of Pavia, where he leads the Bioinorganic Chemistry group. His research focuses on the role of metal ions in biological systems, enzymes, oxidative stress and neurodegeneration. He employs spectroscopic techniques, kinetic studies and the synthesis of model systems to elucidate the mechanisms underlying redox processes involving metal centres.

B. Positions and Honors

Positions and Employment

	<i>Position</i>
1985-1991	Undergraduate student, C.I.M.A. Department, Bioinorganic Chemistry Group, Università degli Studi di Milano, Milano, IT
1991-1992	Graduate student, Enzymology laboratory, Mario Negri Institute for Pharmacological Research, Milano, IT
1991-1994	PhD student, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT
1995-1995	CEE Postdoctoral fellow, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT
1996-1996	CEE Postdoctoral fellow, Bioinorganic Chemistry laboratory, Departamento de Química, Universidade Nova de Lisboa, Portugal
1996-1997	Postdoctoral fellow, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT
1997-2010	Assistant professor, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT
2011-2020	Associate professor, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT
2020-2026	Full professor, Bioinorganic Chemistry laboratory, Università degli Studi di Pavia, Pavia, IT

Honors

<i>date</i>	<i>Honour</i>
1989	Winner of the “ENICHEM Prize”
1990	Winner of the “ENIMONT Prize”
1991	Winner of the “ENICHEM Prize”
1992	Winner of the national prize “FEDERCHIMICA – PER UN FUTURO INTELLIGENTE”
Since 2010	Co-founder and R&D responsible of Noxamet Ltd, an academic spin-off

Reviewer Experience

Reviewer for several scientific journals. The following is a partial list: ACS Chemical Neuroscience, Angewandte Chemie International Edition, Biochemical and Biophysical Research Communications, Chemistry – an European journal, Coordination Chemistry Reviews, Dalton, European Journal of Inorganic Chemistry, Inorganic Chemistry, Journal of American Chemical Society, Journal of Biological Inorganic Chemistry, Journal of Biological Physics, Journal of Inorganic Biochemistry, Journal of Molecular Catalysis B: Enzymatic, Nature Chemistry, Pharmacological Research, Polyhedron, Tetrahedron Letters

C. Contributions to Science

The research activity (updated in March 2026) has been the subject of 163 publications in peer-reviewed international journals (total number of citations = 7,720, h-index = 43 Scopus/ ISI WoS), 3 book chapters, over 100 communications at Italian and international congresses, and has been published in several conference proceedings.

Most research lines are in the coordination and bioinorganic chemistry fields; they focus on the study of the properties and activities of metalloproteins, in particular heme and multicopper proteins and enzymes. The research is carried out with natural macromolecules and by synthetic models. The aim is to clarify the redox activities of these substances in both catalytic and stoichiometric reactions through extensive use of spectroscopic and spectrometric techniques for the structural determination of the active sites, to obtain information on highly reactive transient species, and to clarify mechanisms of action.

In the field of metallodrug development, a new class of compounds, metalloNONOates, capable to release NO in a controlled way, has been developed. The efficiency of the metalloNONOates as vasorelaxing agents (of blood vessels) and as anticancer drugs has been assessed. This research line is being carried out in collaboration with the spin-off Noxamet.

Recently, the research has focused on the involvement of iron and copper ions in neurodegenerative processes through the study of the interaction of these metal ions with peptides and proteins. The binding and reactivity studies on the model systems allowed to clarify, from a chemical point of view, the mechanisms leading to the formation or quenching of toxic species.

Neurodegeneration has also been studied by analysing the composition, structural features and reactivity (as a scavenger or in the ROS generation activity) of human neuromelanin, a pigment found in the brain and associated with Parkinson's disease. The study has taken advantage by the preparation of synthetic models of neuromelanin which have been synthesized changing the metal composition, the melanic structure, the protein part, the solubility and the size. These synthetic neuromelanin models reproduce the spectroscopic features and many properties of the human pigment; to date, they are the best neuromelanin models available.

List of selected publications of the last 10 yrs

- 1) *Anti-hypertensive property of a nickel-piperazine/NO donor in spontaneously hypertensive rats.* M. Monti, V. Ciccone, A. Pacini, R. Roggeri, E. Monzani, L. Casella, L. Morbidelli. *Pharmacol. Res.*, **107**, 352-359 (2016).
- 2) *Copper(I) forms a redox stable 1:2 complex with α -synuclein N-terminal peptide in a membrane-like environment.* S. Dell'Acqua, V. Pirota, E. Monzani, F. Camponeschi, R. De Ricco, D. Valensin, L. Casella. *Inorg. Chem.*, **55**, 6100-6106 (2016).
- 3) *Copper-A β Peptides and Oxidation of Catecholic Substrates: Reactivity and Endogenous Peptide Damage.* V. Pirota, S. Dell'Acqua, E. Monzani, S. Nicolis, L. Casella. *Chem. Eur. J.*, **22**, 16964-16973 (2016).
- 4) *Synthesis, structure characterization and evaluation in microglia cultures of neuromelanin analogues suitable for modeling Parkinson's disease.* E. Ferrari, A. Capucciati, I. Prada, F.A. Zucca, G. D'arrigo, D. Pontiroli, M.G. Bridelli, M. Sturini, L. Bubacco, E. Monzani, C. Verderio, L. Zecca, L. Casella. *ACS Chem. Neurosci.*, **8**, 501-512 (2017).
- 5) *Prion peptides are extremely sensitive to copper induced oxidative stress.* S. Dell'Acqua, C. Bacchella, E. Monzani, S. Nicolis, G. Di Natale, E. Rizzarelli, L. Casella. *Inorg. Chem.*, **56**, 11317-11325 (2017).

- 6) *Cross-talk between endogenous H₂S and NO accounts for vascular protective activity of the metal-nonoate Zn(PipNONO)Cl*. M. Monti, I. Hyseni, A. Pacini, E. Monzani, L. Casella, L. Morbidelli, *Biochem. Pharmacol.*, **152**, 143-152 (2018).
- 7) *Dopamine, oxidative stress and protein-quinone modifications in Parkinson's and other neurodegenerative diseases*. E. Monzani*, S. Nicolis, S. Dell'Acqua, A. Capucciati, C. Bacchella, F. Zucca, E. Mosharov, D. Sulzer, L. Zecca, L. Casella*. *Angew. Chem., Int. Ed.*, **58**, 6512-6527 (2019). doi: 10.1002/anie.201811122
- 8) *A Stereoselective Tyrosinase Model Compound Derived from an m-Xylyl-L-histidine Ligand*. E. Lo Presti, M.L. Perrone, L. Santagostini, L. Casella, E. Monzani*. *Inorg. Chem.*, **58**, 7335-7344 (2019). doi: 10.1021/acs.inorgchem.9b00473
- 9) *Neuronal proteins as targets of 3-hydroxykynurenine: Implications in neurodegenerative diseases*. A. Capucciati, M. Galliano, L. Bubacco, L. Zecca, L. Casella, E. Monzani*, S. Nicolis*. *ACS Chem. Neurosci.*, **10**, 3731-3739 (2019). doi: 10.1021/acscemneuro.9b00265
- 10) *Binding and Reactivity of Copper to R₁ and R₃ Fragments of tau Protein*. C. Bacchella, S. Gentili, D. Bellotti, E. Quartieri, S. Draghi, M.C. Baratto, M. Remelli, D. Valensin, E. Monzani, S. Nicolis, L. Casella, M. Tegoni, S. Dell'Acqua. *Inorg. Chem.*, **59**, 274-286 (2020). doi: 10.1021/acs.inorgchem.9b02266
- 11) *Membrane binding strongly affects dopamine reactivity induced by Cu-prion and Cu- β peptides. A ternary Cu- β -prion peptide complex is stabilized and solubilized in SDS micelles*. C. Bacchella, S. Nicolis, S. Dell'Acqua, E. Rizzarelli, E. Monzani*, L. Casella*, *Inorg. Chem.*, **59**, 900-912 (2020). doi: 10.1021/acs.inorgchem.9b03153
- 12) *Interaction between hemin and prion peptides: binding, oxidative reactivity and aggregation*. S. Dell'Acqua, E. Massardi, E. Monzani, G. Di Natale, E. Rizzarelli, L. Casella, *Int. J. Mol. Sci.*, **21**, 7753 (2020). doi: 10.3390/ijms21207553
- 13) *A Cu-bis(imidazole)-Substrate Intermediate Is the Catalytically Competent Center for Catechol Oxidase Activity of Copper Amyloid- β* . C. Bacchella, S. Dell'Acqua, S. Nicolis, E. Monzani*, L. Casella*. *Inorg. Chem.*, **60**, 606-613 (2021). doi: 10.1021/acs.inorgchem.0c02243
- 14) *Interaction of neuromelanin with xenobiotics and consequences for neurodegeneration; promising experimental models*. A. Capucciati, F.A. Zucca, E. Monzani, L. Zecca, L. Casella, T. Hofer, *Antioxidants*, **10**, 824 (2021). doi: 10.3390/antiox10060824.
- 15) *Neuromelanins in brain aging and Parkinson's disease: synthesis, structure, neuroinflammatory and neurodegenerative role*. F.A. Zucca, A. Capucciati, C. Bellei, M. Sarna, T. Sarna, E. Monzani, L. Casella, L. Zecca, *IUBMB Life*, 1-11 (2022). doi: 10.1002/iub.2654
- 16) *Water soluble melanin-protein-Fe/Cu conjugates derived from norepinephrine as reliable models for neuromelanin of human brain locus coeruleus*. A. Capucciati, E. Monzani*, M. Sturini, S. Nicolis, F.A. Zucca, L. Bubacco, M. Bortolus, L. Zecca, L. Casella*. *Angew. Chem., Int. Ed.*, **61**, e202204787 (2022). doi: 10.1002/ange.202204787
- 17) *The reactivity of copper complexes with neuronal peptides and its impact on neurodegeneration*. C. Bacchella, S. Dell'Acqua, S. Nicolis, E. Monzani, L. Casella. *Coord. Chem. Review.*, **471**, 214756 (2022). doi: 10.1016/j.ccr.2022.214756
- 18) *Role of the Cysteine in R3 Tau Peptide in Copper Binding and Reactivity*. C. Bacchella, S. Gentili, S.I. Mozzi, E. Monzani, L. Casella, M. Tegoni, S. Dell'Acqua, *Int. J. Mol. Sci.*, **23(18)**, 10726 (2023). doi: 10.3390/ijms231810726
- 19) *Interaction and Redox Chemistry Between Iron, Dopamine and Alpha-Synuclein C-Terminal Peptides*. F. Schifano, S. Dell'Acqua, S. Nicolis, L. Casella*, E. Monzani*, *Antioxidants*, **12**, 791 (2023). doi: 10.3390/antiox12040791
- 20) *Asymmetric Sulfoxidation by a Tyrosinase Biomimetic Dicopper Complex with a Benzimidazolyl Derivative of L-Phenylalanine*. E. Lo Presti, F. Schifano, C. Bacchella, L. Santagostini, L. Casella, E. Monzani*, *Molecules*, **28**, 4487 (2023). doi: 10.3390/molecules28114487
- 21) *Biological Oxidations and Nitrations Promoted by the Hemin- β ₁₆ Complex*. S. De Caro, G. De Soricellis, S. Dell'Acqua, E. Monzani*, S. Nicolis*, *Antioxidants*, **12**, 1319 (2023). doi: 10.3390/antiox12071319
- 22) *Cysteine in R3 Tau Peptide Modulates Hemin Binding and Reactivity*. C. Bacchella, T.B. Guerriere, E. Monzani, S. Dell'Acqua. *Inorg. Chem.*, **63**, 11986-12002 (2024). doi: 10.1021/acs.inorgchem.4c00727
- 23) *A focus on the link between metal dyshomeostasis, norepinephrine, and protein aggregation*. C. Bacchella, A. Capucciati, E. Monzani. *Antioxidants*, **14**, 347 (2025). doi: 10.3390/antiox14030347
- 24) *Modeling midbrain and brainstem neuromelanins to characterize metal binding and MRI contrast in Parkinson's and Alzheimer's diseases*. N. Wallstein, A. Capucciati, A. Pöpll, C.S. Schnohr, M. Sturini, A. Pampel, C. Jäger, L. Zecca, F.A. Zucca, E. Monzani, L. Casella, H. E Möller. *Angew. Chem. Int. Ed.*, e202509102 (2025). doi: doi.org/10.1002/anie.202509102
- 25) *Influence of nitrative stress on the synthesis of neuromelanin model systems*. S. De Caro, F. Schifano, E. Monzani, S. Nicolis. *ACS Chem. Neurosci.* **16**, 4289-4296 (2025). doi: 10.1021/acscemneuro.5c00676

D. Past and Ongoing Research Support

	Project Title	Funding Agency	Role in the project
2023-2026	Bioinspired systems for ROS regulation: metalloporphyrinoids in neurodegeneration and artificial biocatalysis	PRIN project, Italian Ministry of Education, University and Research	Collaborator
2015-2016	Metal ions, dopamine, and oxidative stress in Parkinson's disease	PRIN project, Italian Ministry of Education, University and Research	Collaborator
2012-2013	Utilizzo di donatori di ossido di azoto nel miglioramento della resistenza ai patogeni in piante di interesse industriale	Lombardia Sardegna project	Collaborator and scientific coordinator of the spin-off Noxamet Ltd
2012-2014	Ioni metallici nelle patologie da invecchiamento: interplay tra metallostasi e proteostasi nella neurodegenerazione	PRIN project, Italian Ministry of Education, University and Research	Collaborator
2008-2010	Ioni metallici, neuromelanina e stress ossidativo nella malattia di Parkinson	PRIN project, Italian Ministry of Education, University and Research	Collaborator
2005-2007	Processi chimici e modificazioni strutturali nella neurodegenerazione	PRIN project, Italian Ministry of Education, University and Research	Collaborator
2004	Complessi peptide-microperossidasi come modelli di perossidasi (Microperoxidases-Peptide Complexes as Models for Peroxidases)	Italian CNR project	Principal investigator
2003-2005	Folding e aggregazione di proteine: Metalli e biomolecole nelle malattie conformazionali	FIRB project, Italian Ministry of Education, University and Research	Collaborator
2001-2006	Metalloenzymes and chemical biomimetics	COST project Chemistry D21, Marie Curie Actions, UE	Collaborator
2000-2002	The basic chemistry of peroxynitrite and related species: reactions with antioxidants, metalloproteins and their models	INTAS project, UE	Collaborator
2001	Metabolismo e targets di NO (NO metabolism and targets)	Italian CNR project	Collaborator
1993-1997	Dinuclear and polynuclear metal centres in biology: enzymes and synthetic analogues	Human Capital and Mobility, UE	Collaborator

E. Experience as a research supervisor

Supervision of three postdoc researchers, four PhD theses in Chemical Sciences and three IUSS PhD theses in Biomolecular Sciences and Biotechnology of the University of Pavia. Supervision of approximately thirty experimental research theses for the degree in Biotechnology (bachelor's degree), Industrial Biotechnology (master's degree) and Chemistry (master's degree).