Curriculum Vitae

Vincent L. Pecoraro, PhD

Department of Chemistry, Ann Arbor, MI 48109
Phone (734) 763-1519
vlpec@umich.edu
https://sites.lsa.umich.edu/pecoraro-lab/

Education:

08/84	National Institute of Health, Postdoctoral Fellow, University of Wisconsin, Madison Advisor: W. W. Cleland
09/81	Ph.D., Chemistry, University of California, Berkeley Advisor: K. N. Raymond
06/77	B.S., Biochemistry, University of California, Los Angeles Advisor: W. F. Libby

Professional Experience:

Present	John T. Groves Collegiate Professor, Department of Chemistry and Senior Research Scientist, Biophysics Research Division, University of Michigan, Ann Arbor Membership in Institutes and Interdisciplinary Programs (U of M) Center for Molecular Genetics (Exec. Comm., 1987-90), Molecular Biophysics Training Program (PI, 1989-90), Cellular Biotechnology Training Program Chemistry Biology Interface Training Program (Director, 2004-2012) Chemical Biology Ph.D. Program (Program Committee, 2004-) Blaise Pascal International Chair for Research, University of Paris-11 (2011-12)
1992-2005	Professor, Department of Chemistry
04/1998	*Professeur Visite*, Universite de Paris-Sud (11), Orsay, France
01-08/1998	*Visiting Professor,* Wilhelms Westfalische Universitat, Munster, Germany
08-12/1997	*Visiting Research Scientist*, Merck Central Research, Rahway
1989-1992	*Associate Professor*, Department of Chemistry, University of Michigan, Ann Arbor
01-06/1991	*Visiting Associate Professor* of Chemistry, University of North Caroline, Chapel Hill
1984-1989	*Assistant Professor*, Department of Chemistry, University of Michigan, Ann Arbor

Research Interest:

Present	Synthetic models for the active site structure and chemical mechanism of manganese enzymes. Biological chemistry of vanadium. Development of the chemistry of metallacrowns. *De Novo* metallopeptides design.
08/84	The use of cobalt(III) and chromium(III) nucleotides to elucidate the mechanism of phosphoryl transfer in kinases. Stability, structure, and metal ion exchange kinetics of M(II) nucleotide phosphorothioates.
08/81	Determination of the metal binding residues in transferrin. Stability of Fe(III), Ga(III), and In(III) complexes of multidentate catecholate chelating agents. Mechanism of iron transport to bacteria by siderophores.

Research Group (Fall, 2019)

5 graduate students, 4 undergrads, 1 visiting scholar

Honors, Awards and Fellowships:

National Institutes of Health Postdoctoral Fellow (1981-1984)

Horace H. Rackham Foundation Fellow (1985)

Eli Lilly Foundation Fellow (1985)

G.D. Searle Biomedical Research Scholar (1986-1989)

Alfred P. Sloan Fellow (1989-1990)

LS&A Award for Excellence in Undergraduate Instruction (1991)

Faculty Recognition Award, University of Michigan (1993)

ACS Akron Section Award for Excellence in Chemistry (1995)

Frontier's Lecturer, Texas A & M University (1996)

Mary Kapp Lecturer, Virginia Commonwealth University (1997)

Alexander von Humboldt Stiftung (1998)

Karcher Lecturer, University of Oklahoma (1999)

PittCon Lecturer, Duquesne University (2004)

Alexander Von Humboldt Award for Senior US Scientists (1998-99)

Chair, Metals in Biology Gordon Conference, (2000)

Fellow, American Association for the Advancement of Science (2000-)

US Young Investigator for IUPAC Assembly (2001)

ICBIC Plenary Lectures (2001)

Plenary Lecturer, International Conference on Biological Inorganic Chemistry (2001)

Margaret and Herman Sokol Faculty Award in the Sciences (2004-5)

Distinguished Faculty Achievement Award, University of Michigan (2008)

La Chaire Internationale des Recherche Blaise Pascal (2010-2012)

Taiwan National Lecturer (2010)

ACS Fellow (2011-)

Vanadis Award (2010)

Blaise Pascal International Chair for Research (2011-2012)

ACS Award for Distinguished Service in the Advancement of Inorganic Chemistry (2016)

2016 Luigi Sacconi Memorial Lecture, University of Florence, Florence, Italy

2017 Kenneth N. Raymond Lecturer, University of California, Berkeley

ISABC Plenary Lecturer (2017)

ICBIC Plenary Lecturer (2017)

Other Experience and Professional Memberships:

American Association for the Advancement of Science (Fellow 2001-)

American Chemical Society

American Society of Biochemists and Molecular Biologists

Society of Biological Inorganic Chemistry Council Member (2000-2003)

Sigma Xi

Alpha Chi Sigma (Chemistry Fraternity)

Editorial Board, ACS Books (1991-1996)

Associate Editor, Inorganic Chemistry (1994-2014)

Journal of Bioinorganic Chemistry Publication Committee (1996-)

Chairman, Keystone Symposia on Cellular and Molecular Biology, The Metal Ion/Molecular Biology Interface (1992)

Chairman, Gordon Conference, Metals in Biology (2000)

Vice-Chair, ICBIC (2005)

NIH Study Sections: Chemistry/Biology Interface (1992-1993)

Metallobiochemistry (1993-1996)

Chair, Committee for Underrepresented Minority Fellowship (2007-2008)

Teaching:

<u>Courses Taught</u>

Chemistry 120 (Freshman Seminar) W'09,10

Chemistry 123 (General Chemistry) W'85

Chemistry 124 (General Chemistry) F'84

Chemistry 125 (General Chemistry Laboratory) W'89,90

Chemistry 302 (Soph. Inorganic Chem.) F'90, F'92, F'95, W'96, F'98, W03

Chemistry 303 (Soph. Bioinorganic Chem) W13-20

Chemistry 312 (Sophomore Synthesis Laboratory) F'94, W'95

Chemistry 399 (Undergraduate Research) W'85-W'04

Chemistry 403/402 (Sr. Inorg. Chem.) W'88, F'88, W'99, F'00-10, F12

Chemistry 413 (Inorg. Synthetic Lab) W'87

Chemistry 419 (Jr./Sr. Writing Requirement) W'88

Chemistry 485 (Jr./Sr. Adv. Independent Laboratory) F'94

Chemistry 507 (Graduate Inorg. Chem.) F'85, F86, F87, F94, F13-17

Chemistry 525 (Graduate Chemical Biology) F'00, F01

Chemistry 526 (Graduate Chemical Biology) W99, W02, W04

Chemistry 548 (Graduate CBI Core Course) F13

Chemistry 616 (Graduate Physical Inorganic) W'98, W14, W15

Biophysics 801 (Biophysics Student Seminar) F'89

Chemistry 710 (Special Topics: Bioinorganic) F'89,W94

Chemistry 711 (Chemistry Biology Interface Core Course) F' 96, W13

Chemistry 802 (Inorg. Seminar) W'85, W'87, F'92

Chemistry 990 (Graduate Research)

Chemistry 21 (2nd term gen chem) UNC, Chapel Hill W91

Selected Publications (complete list on https://sites.lsa.umich.edu/pecoraro-lab/publications/):

Papers on the structure and reactivity of Manganese in manganoenzymes

1. Larson, E.; Pecoraro, V. L. "The Peroxide Dependent μ_2-O Bond Formation of [Mn(IV)SALPN(O)]2" *J. Amer. Chem. Soc.*, ***1991***, 113, 3810.
2. Pecoraro, V. L.; Hsieh, W-Y, "The Use of Model Complexes to Elucidate the Structure and Function of Manganese Redox Enzymes", Chapter 14 in "Metals Ions in Biological Systems", Vol 37, Astrid Sigel and Helmut Sigel, eds., Marcel-Dekker, Inc., Basel, Switzerland, **2000**, 429-504.
3. Pecoraro, V. L.; Baldwin, M. J.; Caudle, M. T.; Hsieh, W-Y.; Law, N. A. "A Proposal for Water Oxidation in Photosystem II", *Pure & Appl. Chem.*, **1998**, 70, 925.
4. Gelasco, A.; Pecoraro, V. L. "[Mn(III)(2-OHSalpn]2 is an Efficient Functional Model for the Manganese Catalases" *J. Amr. Chem. Soc.*, **1993**, 115, 7928.

Papers on the biological chemistry of Vanadium

5. Smith, T. A.; Root, C.; Kampf, J. W.; Rasmussen, P.; Pecoraro, V. L. "Reevaluation of the Additivity Relationship for Vanadyl Imidazole Complexes: Correlation of the EPR Hyperfine Constant with Ring Orientation", *J. Amr. Chem. Soc.*, **2000**, 122, 767-775.
6. Cornman, C. R.; Colpas, G. J.; Hoeschele, J. D.; Kampf, J.; Pecoraro, V. L. "Implications for the Spectriscopic Assignment of Vanadium Biomolecules: Structural and Spectroscopic Characterization of

Monooxovanadium(V) Complexes Containing Catecholate and Hydroximate Based Non-Innocent Ligands", *J. Amr. Chem. Soc.*, **1992**, 114, 9925.
7. Colpas, G. J.; Hamstra, B.; Pecoraro, V. L. "A Functional Model for Vanadium Haloperoxidase", *J. Amr. Chem. Soc.*, **1994**, 116, 3627.
8. Smith, T. S.; Pecoraro, V. L. "Oxidation of Organic Sulfides by Vanadium Haloperoxidase Model Complexes", *Inorg. Chem.*, **2002**, 41, 6754-6760.

Papers on Metallacrowns

9. Martinic, I; Eliseeva, S. V.; Nguyen, T.; Pecoraro, V. L.; Petoud, S. "Near-Infrared Optical Imaging of Necrotic Cells by Photostable Lanthanide-Based Metallacrowns", *J. Amr. Chem. Soc.*, **2017**, 139(25), 8388-8391.
10. Jankolovits, J.; Andolina, C.M.; Kampf, J.W.; Raymond, K.N.; Pecoraro, V.L. "Assembly of Near-Infrared Luminescent Lanthanide Host(Host-Guest) Complexes With a Metallacrown Sandwich Motif" *Angew. Chem. Int. Ed.*, **2011**, *50*(41), 9660-9664.Mezei, G.; Zaleski, C.; Pecoraro, V. L. "Structural and Functional Evolution of Metallacrowns", *Chem. Rev.*, **2007**, 107, 4933-5003.
11. Chow, C. Y.; Eliseeva, S. V.; Trivedi, E. R.; Nguyen, T.; Kampf, J. W.; Petoud, S.; Pecoraro, V. L. "Ga^{3+}/Ln^{3+} Metallacrowns: A Promising Family of Highly Luminescent Lanthanide Complexes that Covers Visible and Near-Infrared Domains", *J. Amer. Chem. Soc.*, **2016**, 138, 5100-51009.
12. Nguyen, T.N.; Chow, C.Y.; Eliseeva, S.V.; Kampf, J.W.; Trivedi, E.R.; Martinic, I Petoud S.; Pecoraro, V.L. "One-step Assembly of Visible and Near-infrared Emitting Metallacrown Dimers Using a Bifunctional Linker" *Chem. Eur. J.*, **2018**, 24, 1031-1035.
13. Trivedi, E.R.; Eliseeva, S.V.; Jankolovits, J.; Olmstead, M.; Petoud, S. Pecoraro, V.L. "Highly Emitting Near-Infrared Lanthanide "Encapsulated Sandwich" Metallacrown Complexes with Excitation Shifted Toward Lower Energy" *J. Amer. Chem. Soc.* **2014**, 136, 1526−1534.
14. Lutter, J.C.; Lopez-Bermudez, B.A.; Nguyen, T.N.; Kampf, J.W.; Pecoraro, V.L. "Functionalization of Luminescent Lanthanide-Gallium Metallacrowns using Copper-Catalyzed Alkyne-Azide Cycloaddition and Thiol-Maleimide Michael Addition" *J. Inorg. Biochem.*, **2019**, 192,119-125.

Papers on *De Novo* design of metallopeptides and proteins

15. Ruckthong, L.; Zastrow, M. L.; Stuckey, J. A.; Pecoraro, V. L. "A Crystallographic Examination of Predisposition Versus Preorganized in *de Novo* Designed Metalloproteins", *J. Amer. Chem. Soc.*, **2016**, 138, 11979-11988.
16. Zastrow, M. L.; Peacock, A. F.; Stuckey, J. A.; Pecoraro, V. L. "Hydrolytic catalysis and Structural Stabilization in a Designed Metalloproteins" *Nature: Chemistry*, **2012**, 4, 118-123.
17. Tegoni, M.; Yu, F.; Berseloni, M.; Penner-Hahn, J. E.; Pecoraro, V. L. "Designing Fuctional Type 2 Copper Centers Within Alpha-Helical Coiled Coild that Have Nitrite Reductase Activity", *Proc. Nat. Acad. Sci.*, **2012**, 109, 21234-21239.
18. Mocny, C. S.; Pecoraro, V. L. "*De Novo* Protein Design as a Methodology for Synthetic Bioinorganic Chemistry" *Accts. Chem. Resrch.*, **2015**, 48, 2388-2396.
19. Mathieu, E.; Tolbert, A. E.; Koebke, K.; Tard, C.; Iranzo, O.; Penner-Hahn, J.; Policar, C.; Pecoraro, V. L. "Rational *De Novo* Design of a Cu-Metalloenzymes for Superoxide Dismutation" *Chem. Eur J*, **2019**, 25, 1-11
20. Pinter, T. J.; Koebke, K.; Pecoraro, V. L. "Catalysis and Electron Transfer in *De Novo* Designed Helical Scaffolds" *Agew. Chem.*, **2019**