Timothy E. Elgren
Department of Chemistry, Hamilton College, Clinton, New York 13323
(315) 859-4695

EDUCATION:

University of Minnesota Minneapolis, Minnesota — Postdoctoral Fellowship 1990-92
Mentor: Professor Lawrence Que, Jr.

Dartmouth College Hanover, New Hampshire — Ph.D., December 1989
Advisor: Professor Dean E. Wilcox

Hamline University St. Paul, Minnesota — B.A., June 1984

TEACHING AND ADMINSTRATIVE EXPERIENCE:

Montana State University, Bozeman, Montana
Visiting Research Faculty (Sabbatical leave) 2004 – 2005
Council on Undergraduate Research, Washington, D.C.
President 2004-2005, Executive Board 2003-2006
Hamilton College Clinton, New York
Professor of Chemistry, 2006 – present
Associate Dean of the Faculty, 2000 – 2004
Worked with Dean of Faculty on matters of the instructional budget, facilities, faculty grants, department and program reviews, personnel, and salary. Served as Affirmative Action Officer on faculty hires and coordinated the academic advising system in cooperation with Dean of Students office.
Chair of Biochemistry Program, 1999- 2004, 2006 – present
Associate Professor of Chemistry, 1999- 2006
Assistant Professor of Chemistry, 1993 – 1999
Hamilton Courses taught: General Chemistry (Chem 111, 120); Biological Chemistry (Chem 270); Classical Physical Chemistry (Chem 333); Biophysical Chemistry (Chem 436); Advanced Laboratory Techniques (Chem 351, 352); Miracles, Disasters and Everyday Chemistry (Chem 105), Scientific and Social Perspectives on HIV/AIDS (SSem 245), Senior Thesis I and II (Biochem 550, 551), Senior Research Tutorial (Biochem 559), Senior Fellowship Research. Principal research advisor for 25 senior research projects and four senior fellowships. Research interests: Spectroscopic investigations of the structure and reactivity of metalloproteins and sol-gel encapsulated proteins.
Knox College Galesburg, Illinois
Assistant Professor of Chemistry, 1992 – 1993
Teaching responsibilities: General chemistry and biochemistry.

AWARDS, HONORS, AND EXTERNAL FUNDING

National Science Foundation: Research at Undergraduate Institutions
"Mechanistic Studies of Encapsulated Enzymes" $260,000, July 2006
Research Corporation: Departmental Development Award (project director and primary writer)
"Five-Year Plans for Hamilton Chemistry and Physics Departments" $500,000, July 2006
National Science Foundation: Major Research Instrumentation
"Acquisition of a Raman Microscope" $220,000, September 2004
President of the Council on Undergraduate Research, 2004-05, three-year term on CUR Executive Board.
Petroleum Research Fund of the American Chemical Society: UFS Grant
"Characterization of Intermediates in the Catalytic Cycle of Amine Oxidases" $50,000, June 2004
Cottrell College Science Award: Research Corporation
"Characterization of Sol-Gel Encapsulated Amine Oxidase and Chloroperoxidase" $35,000, June 2004
Merck/American Association for the Advancement of Science: Undergraduate Science Research Program
"Collaborative Projects at the Interface of Biology and Chemistry" $60,000, June 2004
Camille and Henry Dreyfus Special Grant Program in Chemical Sciences 2001
" An Integrative, Investigative, Advanced Laboratory Course" $25,000 Spring 2001
National Science Foundation: Course, Curriculum and Laboratory Improvement
"Calorimetry and Capillary Electrophoresis in the Undergraduate Teaching Laboratory" $66,334, June 1999
The John R. Hatch Excellence in Teaching Award Hamilton College, May 1998
Hamilton College Class of 1966 Career Development Award

"Investigative Laboratories for Biochemistry" $2,000 Summer 1998

Emerson Student-Faculty Collaboration Award
"Sol-Gel Encapsolation of Proteins" $5,000 Summer 1998

National Institutes of Health: AREA Program
"Neurocuprein: A Novel Copper Protein" $113,491 3 year grant, May 1997

Petroleum Research Fund of the American Chemical Society
"Neurocuprein: A Novel Type II Copper Protein" $25,000 2 year grant, December 1996

Hamilton College Class of 1966 Career Development Award
"Biophysical Chemistry Laboratory Development" $2,000 Summer 1995

Camille and Henry Dreyfus Special Grant Program in Chemical Sciences 1994
"Application of Biophysical Chemistry: An Undergraduate Laboratory" $11,900 Spring 1994

Research Corporation "Spectroscopic Studies of Neurocuprein and its Catalytic Role in Catecholamine Oxidation" $29,035 2 year grant, September 1993

Petroleum Research Fund of the American Chemical Society
"The Catalytic Role of Neurocuprein in Catecholamine Oxidation" $20,000 2 year grant, September 1993

National Science Foundation - Research Opportunity Award Univ. of Minnesota, 1993
"Exogenous Ligand Binding to the Diiron Clusters of Ribonucleotide Reductase"

PUBLICATIONS: (*Hamilton student co-author)

21. Elgren, Timothy E.; Zadvorny, Oleg A.; Brecht, Eric; Douglas, Trevor; Zorin, Nikolay A.; Maroney, Michael J.; Peters, John W. "Immobilization of Active Hydrogenase Enzymes by Encapsulation in Polymeric Porous Gels" *Nano Letters*, 5, 2085-2087, 2005.
20. Pierce, Brad S.; Elgren, Timothy E. and Hendrich, Micheal P. "Mechanistic Implications for the Formation of the Diiron Clusters in Ribonucleotide Reductase Provided by Quantitative EPR Spectroscopy", *Journal of the American Chemical Society*, 125, 8748-8759, 2003.
19. Senior, SueAnn Z.; Mans, Laura;* VanGuilder, Heather D.;* Kelly, Kimberly A.;* Hendrich, Michael P. and Elgren, Timothy E. "Catecholase Activity Associated with Copper-S100B", *Biochemistry*, 42, 4392-4397, 2003.
18. Smith, Kevyn; Silvernail, Nathan; Rodgers, Kenton R. Elgren, Timothy E.; Castro, Mauro* and Parker, Robert* "Sol-gel Encapsulated Horseradish Peroxidase: A Catalytic Material for Peroxidation", *Journal of the American Chemical Society*, 124, 4247-4252, 2002.
17. Marcoline, Anne T.* and Elgren, Timothy E. "A Thermodynamic Study of Azide Binding to Myoglobin", *Journal of Chemical Education*, 75, 1622-1623, 1998.
16. Elgren, Timothy E. "Consideration of Lewis Acidity in the Context of Heme Biochemistry: A Molecular Visualization Exercise", *Chemical Educator,* 3:3, 1-11, 1998.
15. Elgren, Timothy E.; Orville, Allen M.; Kelly; Kimberly A.;* Lipscomb, John D.; Ohlendorf, Douglas H. and Que, Lawrence Jr. "Crystal Structure and Resonance Raman Studies of Protocatechuate 3,4-Dioxygenase Complexed with 3,4-Dihydroxyphenylacetate", *Biochemistry,* 36, 11504-11513, 1997.
14. Stemmler, Timothy L.; Sossong, Thomas R.; Goldstein, Jonathan I.;* Ash, David A.; Elgren, Timothy E.; Kurtz, Donald M., Jr. and Penner-Hahn, James E., "Comparison of the Dinuclear Mn Core Solution Structure of Mn Catalase, Arginase and Mn Substituted Forms of Ribonucleotide Reductase and Hemerythrin", *Biochemistry,* 36, 9847-9858, 1997.
13. Silva, Kathleen E.; Elgren, Timothy E.; Que, Lawrence, Jr. and Stankovich, Marian T., "Electron Transfer Properties of the R2 Protein of Ribonucleotide Reductase from *E. coli*", *Biochemistry*, 34, 14093-14103, 1995.
12. Jones, William B.; Elgren, Timothy E.; Morelock, Maurice M.; Elder, Richard C. and Wilcox, Dean E., "Technetium Metallothionein: Spectroscopic and EXAFS Study of $^{99}TcO^{+3}$ Binding to Zn_7-Metallothionein", *Inorganic Chemistry*, 33, 5571-5578, 1994.
11. Elgren, Timothy E.; Ming, Li-June and Que, Lawrence, Jr., "Spectroscopic Studies of Co(II)-Reconstituted Ribonucleotide Reductase R2 from *E. coli*", *Inorganic Chemistry*, 33, 891-894 (1994).

10. Elgren, Timothy E.; Hendrich, Michael P. and Que, Lawrence, Jr., "Azide Binding to the Diferrous Form of Ribonucleotide Reductase R2 Protein", *Journal of the American Chemical Society*, 115, 9291-9292 (1993).
9. Holz, Richard C.; Elgren, Timothy E.; Pearce, Linda L.; Zhang, Jian H.; O'Connor, Charles J. and Que, Lawrence, Jr., "Spectroscopic and Electrochemical Properties of (μ-oxo)diiron(III) Complexes Related to Diiron-Oxo Proteins. Structure of $[Fe_2O(TPA)_2(MoO_4)](ClO_4)_2$", *Inorganic Chemistry,* 32, 5844-5850 (1993).
8. Zang, Yan; Elgren, Timothy E.; Dong, Yanhong and Que, Lawrence, Jr., "A High Potential Ferrous Complex and Its Conversion to an η^2-Alkylperoxoiron(III) Intermediate: A Lipoxygenase Model", *Journal of the American Chemical Society*, 115, 811-813 (1993).
7. Dong, Yanhong; Ménage, Stéphane; Brennan, Bridget A.; Elgren, Timothy E.; Jang, Ho G.; Pearce, Linda L. and Que, Lawrence Jr. "Dioxygen Binding to Diferrous Centers: Models for Diiron-oxo Proteins", *Journal of the American Chemical Society*, 115, 1851-1859 (1993).
6. Anderson, Kristoffer K.; Elgren, Timothy E.; Que, Lawrence, Jr. and Lipscomb, John D. "Accessibility to the Active Site of Methane Monooxygenase: The First Demonstration of Exogenous Ligand Binding to the Diiron Cluster", *Journal of the American Chemical Society*, 114, 8711-8713 (1992).
5. Schallreuter, Karin U.; Elgren, Timothy E.; Nelson, Lowell S.; MacFarlan, S.; Yan-Sze, Isaac and Hogenkamp, Henricus P. "Ribonucleotide Diphosphate Reductase from Human Metastatic Melanoma" *Melanoma Research*, 2, 393-400 (1992).
4. Elgren, Timothy E.; Lynch, John B.; Juarez-Garcia, Carlos; Münck, Eckard; Sjöberg, Britt-Marie and Que, Lawrence, Jr. "Electron Transfer Associated with Oxygen Utilization by Ribonucleotide Reductase", *Journal of Biological Chemistry*, 266, 19265-19268 (1991).
3. Hendrich, Michael P.; Elgren, Timothy E. and Que, Lawrence, Jr. "A Mixed Valence Form of the Iron Clusters in the B2 Protein of Ribonucleotide Reductase from *E. coli*", *Biochemical and Biophysical Research Communications*, 176, 705-710 (1991).
2. Kull, F. Jon; Reed, Michael F.; Elgren, Timothy E.; Ciardelli, Thomas L. and Wilcox, Dean E. "Solid Phase Peptide Synthesis of the α and β Domains of Human Liver Metallothionein and the Metallothionein of *Neurospora crassa*.", *Journal of the American Chemical Society*, 112, 2291-2298 (1990).
1. Elgren, Timothy E. and Wilcox, Dean E. "A Unique Low Frequency Raman Band Associated with Metal Binding to Metallothionein", *Biochemical and Biophysical Research Communications*, 163, 1093-1099 (1989).

BOOKS:

Karukstis, Kerry, and Elgren, Timothy (co-editors) *Developing and Sustaining a Research-Supportive Curriculum: A Compendium of Successful Practices*. Washington, DC: Council on Undergraduate Research, 2007.

REPORTS, PEDAGOGY AND POLICY PAPERS:

4. Paris, David C. and Elgren, Timothy E. "Advising: "Less is More"?" *Inside HigherEd* (Sept. 29, 2006) http://insidehighered.com/views/2006/09/29/paris
3. Elgren, Timothy E. and Hensel, Nancy "Undergraduate Research Experiences: A Synergistic Relationship Between Scholarship and Teaching" *Peer Review*, 8, 4-7 (2006).
2. Housic, Diane and Elgren, Timothy E. "Curricular Structures to Support Undergraduate Research" (2003) (http://abacus.bates.edu/acad/depts/chemistry/twenzel/summit.html)
1. Elgren, Timothy E.; Domack, Eugene W. and Guyot-Bender, Martine "A Cross-Cultural Science Program" *CUR Quarterly*, 19, 190 (2000).

RECENT LECTURES AND PRESENTATIONS: (only undergraduate student co-authors listed)

Gordon Research Conference: "Metals in Biology" Ventura, California, January 2008

"Oxidative Dehalogenation by Encapsulated Peroxidases" with Sydney Fasulo, Christina Clark, Nick Berry and Ngoda Manongi.

National Press Club Washington, DC, February 2007
Panel: "Advancing Competitiveness Agenda by Improving Teaching and Student Learning"

Gordon Research Conference: "Metals in Biology Ventura, CA, January 2007
Poster presentation: "Halogenation and Oxidative Dehalogenation Activites of Sol-Gel Encapsulated Peroxidases"

Second Annual Japan-China Crossover Science Symposium
Ibaraki University Mito, Japan, October 2006
Invited talk: "Sol-Gel Encapsulated Enzymes: Spectroscopic and Mechanistic Studies"

Colgate University Hamilton, NY September 2006
Invited talk: "Harnessing the Power of an Enzyme"

University of Massachusetts–Amherst Amherst, MA, February 2006
Invited talk: "Sol-Gel Encapsulation of Proteins: Harnessing the Power of an Enzyme"

National Conference of the American Associate for the Advancement of Science
St. Louis, MO, February 2006
Invited talk: "Undergraduate Research Experiences: A Natural Synergy Between Teaching and Research.

Gordon Research Conference: "Protein Derived Cofactors, Radicals, and Quinones"
Ventura, California, January 2006
Invited talk: "Encapsulation of Metalloenzymes: Mechanistic and Spectroscopic Studies"

Gordon Research Conference: "Metals in Biology" Ventura, California, January 2005
"Encapsulation of Metalloenzymes: Mechanistic and Spectroscopic Studies" with Robert Gordon and Jeff Rubino.

National Conference of the American Chemical Society San Diego, California January 2005
Invited talks: "Departmental Five-Year Planning" and "Infusing Civic Engagement and Public Policy into the Biochemistry Curriculum"

Macalester College St. Paul, Minnesota, November 2004
Invited talk: "Harnessing the Power of an Enzyme"

Gordon Research Conference: "Metals in Biology" Ventura, California, January 2004
Poster Presentation "Sol-Gel Encapsulation of Amine Oxidase" with Robert Gordon and Jeff Rubino.

National Conference of the American Chemical Society New York, New York 2003
Invited Talk: "Miracles, Disasters and Everyday Chemistry: Introducing Chemistry and Citizenship"

National Conference of the American Chemical Society New Orleans, Louisiana 2003
Poster Presentations: "Encapsulation of Peroxidases: Novel Catalytic Materials" with Robert Parker and Jeff Rubino; "Sol-Gel Encapsulation of Amine Oxidase" with Robert Gordon; "An Integrated Context for Introducing Research Methods in Chemistry" with Ryan Palmitesso.

9th National Conference of the Council on Undergraduate Research Connecticut College, June 2002
Two presentations: "Innovative Chemistry Curricula that Support Undergraduate Research" and "Institutionalizing Research for All"

Gordon Research Conference: "Metals in Biology" Ventura, California, January 2002
Poster Presentation "Sol-Gel Encapsulated Horseradish Peroxidase: A Catalytic Material for Peroxidation" with Mauro Castro and Robert Parker.

University of Rochester Rochester, New York, October 2001
Invited Lecture: "Sol-Gel Encapsulation of Horseradish Peroxidase: An Novel Catalytic Material"

Tenth International Conference on Biological Inorganic Chemistry Florence, Italy; August 2001
Poster Presentation: "Catecholase Activity Associated with Cu-S100B" with Heather VanGuilder, Elizabeth Guancial, Laura Mans and Kimberly Kelly. Abstract published *J. Inorg. Biochem.* 86, 210, 2001.

Gordon Research Conference: "Metals in Biology" Ventura, California, January 2001
Poster Presentation: "Catecholase Activity Associated with Cu-S100B" with Heather VanGuilder, Elizabeth Guancial, Laura Mans and Kimberly Kelly.

Utah State University Logan, Utah, March 2000
Invited Lecture: "Peroxide Activation of the Metal Clusters in Ribonucleotide Reductase from E. coli".
Cornell University Ithaca, New York, March 2000
Invited Lecture: "Photreduction of Metalloproteins: Harnessing the Power of Solvated Electrons"
Gordon Research Conference: "Metals in Biology" Ventura, California, January 2000
Poster Presentation"Catecholase Activities Associated with Two Small Copper Proteins from Bovine Brain: Neurocuprein and S100B" with Elizabeth Guancial, Laura Mans and Kimberly Kelly.

SERVICE

Campus Community

Affirmative Action Officer (2000-2004)
Human Subjects Institutional Review Board (2003-2005)
Created and Coordinated a Summer Science Program for local Oneida Nation high school students (2000-present)
Chair ad hoc Committee on Advising 2000-2003
Chair Biochemistry/Molecular Biology Program 1999-2004, 2006 - present
Committee on Academic Policy (elected replacement position, 1996, and three year term, 1998)
Co-Advisor for the Biochemistry/Molecular Biology Program 1993 - present
Acting Chair Biochemistry/Molecular Biology Program 1994-95

Professional Community

President, Council on Undergraduate Research 2004 (three-year term on Executive board).
Councilor, Council on Undergraduate Research (CUR): Elected three times to three-year terms, 1997, 2000, 2003. Co-chair of CUR Scholarships and Grants Committee
Reviewer:
Reviewed tenure/promotion candidates for Harvey Mudd College, Bowdoin College, Occidental College, Colby College, Skidmore College, State University of New York – Geneseo, and Bates College.
External Reviewer of the Chemistry Department at Lycoming College, the Natural Sciences at Florida Southern College (2007), the Colby College Chemistry Department (2007), the College of Wooster Chemistry Department (2006), State University of New York – Geneseo (2006), Trinity University Biology and Chemistry Departments (2004, 2007), University of Wisconsin-Eau Claire Chemistry Program (2004), State University of New York – Purchase Natural Sciences Division (2003), Wellesley College Biological Chemistry Program (2003), Marist College Chemistry Department (2002)
Chair of the Merck and the American Association for the Advancement of Science Undergraduate Science Research Proposal Review Committee (2001-2003), member (2000)
National Science Foundation Graduate Student Fellowship Panel (2006)
National Institutes of Health *ad hoc* study section reviewing Academic Research Enhancement Award proposals (1994)
The Research Corporation, National Science Foundation, The Petroleum Research Fund of the American Chemical Society, Archives of Biochemistry and Biophysics, Biochemistry, Inorganic Chemistry, The Chemical Educator, Inorganic Biochemistry, Inorganica Chimica Acta, Journal of the American Chemical Society, Protein Expression and Purification, NanoLetters, Biomacromolecules, Nano Letters, and Journal of Biological Inorganic Chemistry

SENIOR THESES DIRECTED

Mathew Cashman ’08 “Coupling Enzymes to Photo-Emitting Diodes”
Ngoda Manongi ’08 “Oxidative Dehalogenation: Biomaterials for Environmental Remediation”
Amy Barrow ’08 “Electrochemical Control of Encapsulated Enzymes” (Senior Fellowship)
Hilary Gamble ’07 “Halogenase and Dehalogenase Activities of Encapsulated Peroxidases” (Medical school)
Kathryn Hansen ’07 “Mechanistic Studies of Oxidative Dehalogenation Catalyzed by HRP”
Sergey Piatkovski ’07 “Measuring the Efficiency of Coupled Oxidase and Peroxidase Reactions”
Andrew Downey ’06 “Coencapsulation of Oxidases and Peroxides: Materials for Biosensing” (Analytical chemist at Cambridge Isotopes)
Jeffrey Rubino ’05 “Probing the Electronic Properties of Intermediates in the Catalytic Cycle of Amine Oxidase” (2004 recipient of New York Section of the Society for Applied Spectroscopy Student Award, Duke University pursuing a Ph.D. in chemistry)
Robert Parker ’04 “Dehalogenations Catalyzed by Encapsulated Peroxidases”(Watson Fellowship recipient)
Christopher Butts ’04 “Thermodynamic Characterization of Ca(II) Binding to Tetracycline” (University of Pennsylvania, pursuing a Ph.D. in biological chemistry)
Robert Gordon ’03 “Intermediates Observed in the Turnover of Amine Oxidase Encapsulated in a Sol-Gel” (Currently attending medical school at Boston University)
Ryan Palmitesso ’03 “Sol-Gel Encapsulation of Carboxypeptidase A: A Novel Material for C-Terminal Processing of Peptides”(dental school)
Heather VanGuilder ’02 “Catecholase Activity Associated with Human Cu-S100B” (Pennsylvania State Medical Center, pursuing Ph.D. in neuroscience)
Greg Bemis ’01 “Characterization of a Novel Diiron Complex” (Tufts University Dental School)
Laura Mans ’00 “Catecholase Activities Associated with Two Small Copper Proteins from Bovine Brain: Neurocuprein and S100B” (M.D. from University of St. Louis Medical School, Recipient of 2000 Biochemistry Prize, Chemistry Research Prize)
John Doench ’00 “A pH Profile of the Catalase Activity Associated with Ribonucleotide Reductase” (Howard Hughes Medical Institute Graduate Fellowship recipient, Ph.D. at MIT, post doc at Harvard Medical School)
Mark Seidner ’00 “Isothermal Titration Calorimetric Studies of Calcium Binding” (Watson Fellowship recipient to study AIDS in Developing Nations, currently attending Medical School at Johns Hopkins University)
Liam Smith ’00 “Isolation and Characterization of a Novel Mollusc Hemoglobin” (Graduate program at Johns Hopkins University)
Mauro Castro ’99 “Sol-Gel Encapsolation of Proteins”
Jonathan Goldstein ’98 “Peroxide Activation of the Metal Clusters in the R2 Subunit of Escherichia coli Ribonucleotide Reductase” (Senior Fellowship), (M.D. from Dartmouth College)
Anne Marcoline ’98 “Probing the Catalase Activity of E. coli Ribonucleotide Reductase”, (UC-Santa Barbara, pursuing Ph.D.)
Mathew Weiner ’98 “Isolation of a Manganese-Containing Catalase from Thermus Thermophilus”, Ph.D. in microbiology from the University of Michigan
Kimberly Colvin ’96 “The Purification and Chemistry of Neurocuprein from Bovine Brain” (Senior Fellowship), received Ph.D. in neuroscience at the University of Utah, currently postdoctoral fellow at Harvard University Medical School
Andrew Bomann ’96 “Manganese(II)-Reconstituted R2 from Ribonucleotide Reductase: A Structural and Functional Model of Mn-Catalases”
Kelly Souza ’96 “Copper Binding to Ribonucleotide Reductase”
Lonnie Gelber ’95 "Isolation and Purification of Neurocuprein"
Gary Tucker ’95 "Copper and Protein Analysis of Neurocuprein: Purification of a Copper Containing Bovine Brain Protein", working in chemical industry.
Sejun Ra ‘95 "Stoichiometric Studies of Zn(II)-Reconstituted Ribonucleotide Reductase R2 from *Escherichia coli*"
Lukaz Urban ’94 “Purification and Characterization of Neurocuprein: A Brain Copper Protein” (Senior Fellowship), entered Ph.D. program at Yale University.
Christina Fortner ’93 “Isolation of Neurocuprein from Bovine Brain”