

## CURRICULUM VITAE

### DAVID PETER GIEDROC

#### PERSONAL:

Title: Lilly Chemistry Alumni Professor  
Address: 212 S. Hawthorne Drive  
Department of Chemistry  
Indiana University  
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#### EDUCATION:

1980 B.S. Pennsylvania State University (Biochemistry)  
1984 Ph.D. Vanderbilt University (Biochemistry)  
1984 to 1988 Postdoctoral Yale University (Biochemistry and Biophysics)

#### EXPERIENCE:

1980 to 1981 Research Assistant with Prof. Joseph J. Villafranca  
Pennsylvania State University, Department of Chemistry  
1981 to 1983 Graduate Trainee with Prof. David Puett  
Vanderbilt University, Department of Biochemistry  
1983 to 1984 Graduate Research Assistant with Prof. David Puett  
University of Miami, Department of Biochemistry  
1984 to 1986 Postdoctoral Research Associate with Prof. Joseph E. Coleman  
Yale University, Department of Molecular Biophysics & Biochemistry  
1986 to 1988 NIH Postdoctoral Research Fellow with Prof. Joseph E. Coleman  
Yale University, Department of Molecular Biophysics & Biochemistry  
1988 to 1994 Assistant Professor of Biochemistry, Texas A&M University  
1991 to 1999 Member, Institute of Biosciences and Technology Center for  
Macromolecular Design, Texas A&M University  
1994 to 1999 Associate Professor of Biochemistry, Texas A&M University  
1999 to 2007 Professor of Biochemistry, Texas A&M University  
1999 to 2007 Founding Director, Center for Advanced Biomolecular Research  
1999 to 2007 Faculty Director, Biomolecular NMR Laboratory  
2001 to 2002 Visiting Professor, The Scripps Research Institute  
2002 Visiting Professor, University of Zürich  
2005 to 2007 Director, NIH Molecular Biophysics Training Program, Texas A&M  
2007 to 2015 Professor of Chemistry, Indiana University  
2010 to 2015 Chair, Department of Chemistry, Indiana University  
2011 to present Director, NIH Chemistry-Biology Interface Training Program, IU  
2015 to present Lilly Chemistry Alumni Professor

**HONORS:**

1986 to 1988	NIH Postdoctoral Fellowship
1990 to 1992	American Cancer Society Junior Faculty Research Awardee
1997 to 2001	Member, Editorial Board, <i>Journal of Biological Chemistry</i>
2001 to 2006	Full member, Cancer Drug Development Peer Review Committee, American Cancer Society
2001 to 2006	Faculty Fellow, Texas A&M University
2004	Faculty Fellow, Texas Agricultural Experiment Station
2006 to 2010	Full Member, BRT-B (Biomedical Research Training) SS, NIH
2010	Plenary Speaker, <i>GRASP 2010</i>
2011	Co-Chair, <i>Cell Biology of Metals</i> Gordon Research Conference
2012	Plenary Speaker, <i>5<sup>th</sup> Institute of Metals in Biology of Grenoble (IMBG)</i> International Symposium
2013	Brown and Williamson Distinguished Lecturer, University of Louisville
2014 to 2020	Member and Chair, Editorial Board, <i>Metallomics (RSC)</i>
2014	Distinguished Lecturer, University of California, Los Angeles
2015	2015 Open Chemistry Collaborative in Diversity Equity (OXIDE) Diversity Catalyst Lecturer
2015	NIH MIRA awardee
2018	Co-Chair, <i>11<sup>th</sup> International Copper Meeting, Sorrento, Italy</i>
2019	Plenary Lecturer, <i>International Society of Metallomics-7</i> , Warsaw, Poland
2019	Keynote Lecturer, <i>Cell Biology of Metals</i> Gordon Research Seminar
2019	Member, Scientific Advisory Board, Q-Life Institute, Institut Curie, Paris
2019	Member, International Advisory Board, E3B: Metals in Biology Network, Durham, UK

**AWARDS:**

2012	Elected Fellow, American Association for the Advancement of Science (AAAS)
2014	Elected Fellow, Royal Society of Chemistry (FRSC)
2018	Elected Fellow, American Academy of Microbiology (AAM)

**PROFESSIONAL SOCIETIES:**

American Association for the Advancement of Science; American Chemical Society; Biophysical Society; Royal Society of Chemistry

**EXTRAMURAL GRANT SUPPORT (total costs):**

**Career (1990-present):**

Twenty (22) awards totaling \$17,596,205 as Principal Investigator or co-PI (MPI) and five (5) awards totaling \$604,614 as Collaborating Investigator or in another role

**Current:**

NIH R35 GM118157 (01-05) (Giedroc) *Interplay of Transition Metal Homeostasis and Reactive Sulfur Species in Bacterial Pathogens*, \$2,13,409, 06/01/16-05/31/21

R35 GM118157-03S2 (Giedroc) Instrumentation supplement, *Interplay of Transition Metal*

D. P. Giedroc: Curriculum Vitae (August 2020)

*Homeostasis and Reactive Sulfur Species in Bacterial Pathogens*, \$180,000, 06/01/18-05/31/19

NIH R01 AI101171-08 (Skaar, Chazin, Giedroc; MPI) *Host-mediated zinc sequestration during Acinetobacter baumannii infection*, \$335,000 (Giedroc budget only), 02/01/18-01/31/23

NIH T32 GM131994-01 (01-05) (Giedroc), *Graduate Program in Quantitative and Chemical Biology at Indiana University Bloomington*, \$1,382,178, 07/01/19-06/30/24

**Pending:**

NIH R35 GM118157 (06-10) (Giedroc) *Transition Metal Homeostasis and Reactive Sulfur Species in Bacterial Pathogens*, \$3,100,000, 06/01/21-05/31/26

**Previous:**

The PEW Charitable Trust 29655 (Capdevila), Fellowship award, *Internal Motions and Allostery: Transcriptional Regulators from Pathogenic Bacteria*, \$160,000, 08/01/16-07/31/20

NIH T32 GM109825 (01-05) (Giedroc), *Graduate Program in Quantitative and Chemical Biology at Indiana University Bloomington*, \$812,412, 07/01/14-06/30/19

NIH R01 GM042569 (23-26) (Giedroc), *Structure and Mechanism of Metalloregulatory Proteins*, \$1,334,749. 7/01/12-4/30/16

NIH R01 GM097225 (01-04) (Giedroc), *New Mechanisms of Sulfur Sensing and Trafficking in Staphylococcus aureus*, \$1,071,984, 04/01/11-03/31/15 (no-cost extension through 03/31/16)

NIH R01 GM042569-24S1 (Giedroc), *Structure and Mechanism of Metalloregulatory Proteins (diversity postdoctoral supplement)*, \$187,762, 01/01/14-12/31/15

NIH R01 AI067416 (01-05) (Giedroc (contact), Leibowitz, MPI), *Novel RNA Structures in Coronavirus Replication*, \$1,824,117, 01/01/08-12/31/12 (no-cost extension until 12/31/13)

NIH R01 GM042569 (19-22) (Giedroc), *Structure and Mechanism of Metalloregulatory Proteins*, \$1,284,616, 7/01/08-4/30/12

NIH R01 AI040187 (08-11) (Giedroc), *Structure and Folding of Frameshifting mRNA Pseudoknots*, \$1,238,611, 8/01/03-1/31/07 (no-cost extension to 1/31/08)

NIH T32 GM065088 (01-05) (Giedroc), *Graduate Training in Molecular Biophysics*, \$617,260, 7/1/03-6/30/08

Robert A. Welch Foundation A-1295 (Giedroc), *Coordination Chemistry of Metal Complexes in Metal Sensor Proteins*, \$165,000, 6/1/04 to 5/31/07

Texas A&M University Life Science Task Force (Campbell), *Proposal for an Ocean Health Observing Systems Platform*, \$66,000, 9/1/03 to 8/31/06 (intramural).

D. P. Giedroc: Curriculum Vitae (August 2020)

Texas Higher Education Coordinating Board (THECB) Advanced Research Program 010366-0172-2001 (DeRose), *19-F Nuclear Magnetic Resonance Probes of RNA Structure and Dynamics*, \$52,175, 1/1/02 to 8/31/04.

NIH R01 GM042569 (10-13) (Giedroc), *Zinc Coordination and Regulation of Zinc Metalloproteins*, \$987,760, 4/1/00 to 3/31/04

NIH R01 AI40187 (04-07) (Giedroc), *Structure, Stability and Dynamics of RNA Pseudoknots*, \$839,059 (shared with one sub-contractor), 9/1/99-8/31/03

Texas Higher Education Coordinating Board (THECB) Advanced Research Program 010361-0278-1999 (DeRose), *RNA Structure, Metal Sites, and Dynamics using Site-Specific Isotopic Labels*, \$72,080, 1/1/00 to 12/31/01

NSF DBI-9970232, Multi-user Equipment Program (Giedroc), *High Field NMR Instrumentation for Structural Studies of Proteins and Nucleic Acids*, \$390,000, 4/1/99-3/31/00

Robert A. Welch Foundation A-1295 (Giedroc), *Coordination Chemistry of Zn(II) Complexes in Nucleic Acid Binding Proteins*, \$145,000, 6/1/01 to 5/31/04

NIH R01 GM42569 (06-09) (Giedroc), *Zinc Coordination and Regulation of Zinc-Finger Proteins*, \$658,880, 4/1/96 to 3/31/00

NIH R01 AI40187 (01-03) (Hoffman), *Structure and Stability of RNA Pseudoknots*, \$254,359, 8/1/96 to 7/31/99

Robert A. Welch Foundation A-1295 (Giedroc), *Coordination Chemistry of Zn(II) Complexes in Nucleic Acid Binding Proteins*, \$132,000, 6/1/98 to 5/31/01

NIH R29 GM42569 (01-05) (Giedroc), *Zinc Domain Structure and Function in T4 Gene 32 Protein*, \$491,039, 4/1/91 to 3/31/96

Robert A. Welch Foundation A-1295 (Giedroc), *Coordination Chemistry of Zn(II) Complexes in Nucleic Acid Binding Proteins*, \$109,000, 6/1/95 to 5/31/98

NSF BIR-9217413, Biological Instrumentation Resources Program (Giedroc), *Acquisition of a 500 MHz Nuclear Magnetic Resonance Spectrometer*, \$274,813 (50% of costs; 50% matching funds raised from System sources), 9/1/93 to 8/31/96

American Cancer Society Junior Faculty Research Award JFRA-270 (Giedroc), *Assembly and Genomic RNA Packaging in Animal Retroviruses*, \$88,500, 1/1/90 to 12/31/92

#### **INVITED DEPARTMENTAL RESEARCH SEMINARS:**

- 1988 Department of Molecular Virology and Carcinogenesis, National Cancer Institute-Frederick Cancer Research Facility, Frederick, MD
- 1991 Department of Chemistry, University of Texas at Austin

- 1991 Department of Chemistry, Texas A&M University
- 1992 Department of Biological Chemistry, University of Michigan Medical School
- 1992 Department of Biochemistry, Baylor College of Medicine, Houston, TX
- 1994 Department of Chemistry and Biochemistry, University of Delaware, Newark, DE
- 1997 Department of Chemistry, University of Nebraska
- 1997 Department of Biochemistry and Molecular Genetics, University of Alabama-Birmingham
- 1998 Department of Biochemistry, University of Vermont College of Medicine
- 1999 Department of Cell and Molecular Biology, University of Texas at Dallas
- 2000 Department of Biochemistry and Molecular Biophysics, Washington University School of Medicine
- 2000 Department of Biochemistry and Molecular Biology, University of Chicago
- 2000 Department of Medicinal Chemistry, Purdue University
- 2000 Department of Chemistry, Indiana University
- 2000 Department of Human Biological Chemistry and Genetics, University of Texas Medical Branch at Galveston
- 2000 Department of Chemistry, Northwestern University
- 2000 Department of Chemistry, University of Texas at Arlington
- 2001 Department of Biochemistry and Molecular Biology, Wayne State University
- 2001 Department of Chemistry, University of Michigan
- 2001 Department of Biochemistry and Molecular Biophysics, University of Arizona
- 2002 Department of Molecular Biology, University of Zürich, Switzerland
- 2002 Department of Chemistry and Biochemistry, University of California, San Diego
- 2003 Department of Biochemistry, University of Missouri-Columbia
- 2003 Department of Mathematics and Physics, Royal Veterinary and Agricultural University (KVL), Copenhagen, Denmark
- 2003 Department of Bioinformatics, University of the Saarlands, Saarbrücken, Germany
- 2003 Department of Biosciences, University of Birmingham, Birmingham, UK
- 2003 School of Biosciences, University of Newcastle-upon-Tyne, Newcastle, UK
- 2003 Department of Biochemistry, University of Utah
- 2003 Department of Pharmaceutical Sciences, University of Tokyo, Bunkyo-ku, Tokyo
- 2003 Research Institute for Bioresources, Okayama University, Kurashiki, Japan
- 2003 Department of Chemistry, Kitasato University, Kitasato, Japan
- 2004 Department of Biochemistry and Molecular Biophysics, Washington University School of Medicine
- 2004 Department of Pathology, Texas A&M University
- 2004 Department of Chemistry, University of Iowa
- 2004 Center for Integrative Bioscience, Okazaki National Research Institutes, Okazaki, Japan
- 2004 Department of Pharmaceutical Sciences, University of Maryland, Baltimore
- 2004 Department of Pharmaceutical Sciences, University of Colorado HSC, Denver
- 2005 Department of Biochemistry and Molecular Biology, University of Colorado HSC, Denver
- 2005 Department of Biochemistry and Molecular Biology, University of Massachusetts Medical School
- 2006 Department of Chemistry, Indiana University

- 2006 Department of Chemistry, Wayne State University
- 2006 Department of Cell Biology and Molecular Genetics, University of Maryland
- 2007 Department of Chemistry and Biochemistry, University of California, Los Angeles
- 2007 Department of Biology, Indiana University
- 2008 Department of Chemistry, University of Toledo
- 2008 Department of Biochemistry and Molecular Biology, Indiana University School of Medicine, IUPUI
- 2008 Department of Chemistry, Virginia Tech
- 2008 Department of Chemistry, University of Chicago
- 2008 Department of Molecular Physiology and Biological Physics, University of Virginia School of Medicine
- 2008 Department of Chemistry, St. Louis University
- 2009 Department of Biochemistry and Molecular Biology, Medical University of South Carolina
- 2009 Department of Chemistry and Biochemistry, University of South Carolina
- 2009 Department of Biochemistry, University of Illinois Urbana-Champaign
- 2010 Department of Biochemistry, Molecular and Cell Biology, Northwestern University
- 2010 Department of Chemistry, Michigan State University
- 2010 Department of Biology, Illinois State University
- 2010 Department of Chemistry and Biochemistry, Miami (OH) University
- 2011 Department of Chemistry and Biochemistry, IUPUI
- 2011 Department of Biochemistry and Molecular Biology, Wayne State Univ. (rescheduled)
- 2011 Department of Chemistry and Biochemistry, Ohio State University
- 2011 Department of Biochemistry and Molecular Biology, University of Georgia
- 2011 Department of Chemistry and Biochemistry, Univ. Arkansas, Fayetteville (rescheduled)
- 2011 Department of Biochemistry, Vanderbilt University
- 2012 Department of Chemistry, MIT
- 2012 Department of Microbiology and Immunology, University of Illinois, Chicago
- 2012 Department of Biochemistry, University of Wisconsin-Madison
- 2012 Department of Chemistry and Biochemistry, Worcester Polytechnic Institute
- 2012 Department of Biological Sciences, Purdue University
- 2013 Department of Chemistry, University of Florida
- 2013 Department of Chemistry, University of Louisville
- 2013 Department of Biochemistry and Molecular Biology, University of Kansas Medical Center, Kansas City, KS
- 2013 Department of Chemistry, University of Massachusetts, Amherst
- 2014 Institute for Organic Chemistry and Chemical Biology, Center for Biomolecular Magnetic Resonance (BMRZ), Johann Wolfgang Goethe-University, Frankfurt
- 2014 Department of Chemistry, University of Hamburg, Germany
- 2014 Department of Chemistry and Biochemistry, University of California, Los Angeles
- 2014 Department of Biochemistry and Molecular Biophysics, Washington University School of Medicine, St. Louis
- 2014 Department of Biochemistry, University of Illinois, Urbana-Champaign
- 2014 Department of Chemistry and Biochemistry, University of Notre Dame (rescheduled)
- 2014 Department of Biochemistry, University of Queensland, Australia
- 2014 School of Molecular and Biomedical Science, University of Adelaide, Australia

- 2015 Department of Chemistry and Chemical Biology, Cornell University  
2016 Department of Biochemistry and Molecular Biology, University of Colorado Medical School, Denver  
2016 Department of Chemistry and Biochemistry, University of Colorado, Boulder  
2016 Department of Chemistry, University of Nebraska, Lincoln, NE  
2016 Department of Cell Biology and Molecular Genetics, University of Maryland  
2017 Division of Pharmacology and Toxicology, University of Texas at Austin  
2017 Department of Medicinal Chemistry, Purdue University  
2017 Department of Biochemistry, University of Missouri  
2018 Department of Chemistry and Biochemistry, Illinois State University  
2018 Department of Chemistry, Pennsylvania State University  
2018 Institute of Chemistry, Université de Strasbourg, France  
2018 Department of Chemistry, l'Ecole Normale Supérieure (ENS), Paris, France  
2018 Department of Biochemistry and Molecular Biology, IU School of Medicine  
2018 Departments of Chemistry and CBI Training Program, Johns Hopkins University  
2018 Department of Biochemistry, University of North Carolina, Chapel Hill  
2019 Department of Chemistry and Biochemistry, University of Texas, Dallas  
2019 Department of Chemistry, Texas A&M University  
2019 Department of Chemistry, University of Houston  
2019 Department of Chemistry, University of Hong Kong, Hong Kong, China  
2019 School of Chemistry & Chemical Engineering, Nanjing University, Nanjing, China  
2019 Department of Chemical Biology, Peking University, Beijing, China  
2019 Department of Chemistry, l'Ecole Normale Supérieure (ENS), Paris, France (*tutorial*)  
2019 Department of Chemistry, Wake Forest University  
2019 School of Chemistry and Biochemistry, Georgia Institute of Technology  
2020 Department of Chemistry and Biochemistry, University of Notre Dame  
2021 Department of Plant and Microbial Biology, University of California, Berkeley  
(*postponed*)

**INVITED SYMPOSIUM LECTURES:**

- 1993 *Workshop on Single-Strand Binding Proteins*, Biophysical Society Annual Meeting  
1993 *Inorganic Biochemistry Summer Workshop*, University of Georgia, Athens, GA  
1995 *Inorganic Biochemistry Summer Workshop*, University of Georgia, Athens, GA  
1995 *International Workshop on Bacteriophages*, Salamanca, Spain  
1996 *Gibbs Biothermodynamics Conference*, Carbondale, IL  
1999 *Gibbs Biothermodynamics Conference*, Carbondale, IL  
2001 *Metals and Cells*, Canterbury, UK  
2002 *Metals in Biology Gordon Conference*, Ventura, CA  
2002 *Zinc Signals 2002*, Grand Cayman, British West Indies  
2003 *Proteins Gordon Conference*, New Hampshire  
2003 *Sonderforschungsbereich 579: RNA-Ligand Interactions*, Frankfurt-am-Main, Germany  
2003 *First International Symposium on Biomolecular Chemistry*, Awaji Island, Japan  
2004 *FASEB Conference on Trace Element Metabolism*, Snowmass, CO  
2004 *4th Symposium on Chemical Biology of Metal Sensors*, Yokohama, Japan  
2005 *Cell Biology of Metals Gordon Conference* (discussion leader), Lewiston, ME  
2005 *12<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-12)*, Ann Arbor, MI

- 2006 *Eurobic8*, Aveiro, Portugal
- 2006 *6th International Copper Meeting*, Alghero, Sardinia
- 2007 *Molecular Science and Chemical Biology of Biomolecular Function*, Okazaki, Japan
- 2008 *Conference BioMetals 2008*, Santiago de Compostella, Spain
- 2009 *14<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-14)*, Nagoya, Japan
- 2009 *Cell Biology of Metals Gordon Conference*, Newport, RI
- 2010 *Penn State Summer Symposium in Molecular Biology*, University Park, PA
- 2010 *FASEB Conference on Trace Metal Metabolism*, Snowmass, CO
- 2010 *Biometals 2010*, Tucson, AZ
- 2010 *24<sup>th</sup> Annual Symposium of the Protein Society*, San Diego, CA
- 2010 *Utah Biometals Symposium*, Salt Lake City, UT
- 2010 *GRASP Biomolecular NMR Conference 2010*, Plenary Lecturer, Lawrence, KS
- 2010 *Pacificchem 2010*, Honolulu, HI
- 2011 *The Puett Symposium*, Athens, GA
- 2011 *15<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-15)*, Vancouver, BC
- 2012 *International Society of Zinc Biology Meeting*, Melbourne, Australia
- 2012 *London Mathematical Society*, Durham, UK
- 2012 *British Biophysical Society Annual Meeting*, Durham, UK
- 2012 *5<sup>th</sup> International Meeting of the Institute of Metals in Biology of Grenoble (IMBG)*
- 2012 *8<sup>th</sup> International Copper Meeting*, Alghero, Sardinia
- 2013 *Metals in Biology Gordon Conference*, Ventura, CA
- 2013 *16<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-16)*, Grenoble, France
- 2013 *Cell Biology of Metals Gordon Conference*, Newport, RI
- 2013 *Gibbs Biothermodynamics Conference*, Carbondale, IL
- 2014 *Ernst Strüngmann Forum on Heavy Metals and Infectious Disease*, Frankfurt, Germany
- 2014 *Biometals 2014*, Durham, NC
- 2014 *Fourth Latin American Meeting on Biological Inorganic Chemistry (LABIC)*, Chascomús, Argentina
- 2014 *9<sup>th</sup> International Copper Meeting*, Vico Equense, Italy
- 2014 *7<sup>th</sup> Asian Bioinorganic Chemistry Conference (AsBIC-7)*, Gold Coast, Australia
- 2015 *CanBIC-5*, Parry Sound, Ontario
- 2015 *Metallomics-2015*, Beijing, China
- 2015 *Pacificchem 2015*, Honolulu, HI
- 2016 *ACS National Meeting*, San Diego, CA
- 2016 *FASEB Conference on Trace Metal Metabolism*, Bozeman, MT
- 2016 *ACS National Meeting*, Philadelphia, PA
- 2016 *8<sup>th</sup> Asian Bioinorganic Chemistry Conference (AsBIC-8)*, Auckland, New Zealand
- 2017 *Metals in Biology Gordon Research Conference*, Ventura, CA
- 2017 *ASBMB Annual Meeting*, Chicago, IL
- 2017 *CanBIC-6*, Parry Sound, Ontario
- 2017 *18<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-18)*, Florianapolis, Brazil
- 2017 *Metallomics-2017*, Vienna, Austria
- 2018 *Paris Redox 2018: 20th International Conference on Antioxidants*, Paris, France
- 2018 *Metals in Medicine Gordon Research Conference (discussion leader)*
- 2018 *Biometals 2018*, Ottawa, Canada
- 2018 *EuroBIC 2018*, Birmingham, UK



- 2018 *14th International Symposium on Inorganic Biochemistry*, Wrocław, Poland  
2018 *11<sup>th</sup> International Copper Meeting, Sorrento, Italy (co-chair)*  
2019 *Metals in Biology Gordon Research Conference*, Ventura, CA  
2019 *Q-Life Scientific Symposium*, Paris, France  
2019 *15th International Symposium on Applied Bioinorganic Chemistry (ISABC15)*, Nara, Japan  
2019 *SRM2019*, Osaka, Japan  
2019 *Metallomics-2019*, Warsaw, Poland  
2019 *Cell Biology of Metals Gordon Research Conference*, Castelldefels, Spain  
2019 *Cell Biology of Metals Gordon Research Seminar*, Castelldefels, Spain  
2019 *19<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-19)*, Interlaken, Switzerland  
2019 *Thiol-based switches and redox regulation: From microbes to men*, Girona, Spain  
2019 *TIMB3- Twin to Illuminate Metals in Biology and Biocatalysis through Biospectroscopy*, Lisbon, Portugal  
2020 *FASEB Conference on Trace Metal Metabolism*, Steamboat Springs, CO (*postponed 2021*)  
2020 *15th International Symposium on Inorganic Biochemistry*, Wrocław, Poland (*postponed 2021*)  
2020 *12<sup>th</sup> International Copper Meeting, Sorrento, Italy (postponed 2021)*  
2020 *Pacificchem 2020*, Honolulu, HI (session co-organizer; two lectures) (*postponed 2021*)

**PUBLICATIONS (182 primary; 16 book chapters; h-index=56, Google Scholar):**

- 1) GIEDROC, D. P., Puett, D., Ling, N., & Staros, J. V. (1983) Demonstration by Covalent Cross-linking of a Specific Interaction Between  $\beta$ -Endorphin and Calmodulin. *J. Biol. Chem.* **258**, 16-19.
- 2) Puett, D., GIEDROC, D. P. & Tollefson, S. (1983) *des*-(1-13) Human  $\beta$ -Endorphin Interacts with Calmodulin. *Peptides* **4**, 191-194.
- 3) GIEDROC, D. P., Ling, N., & Puett, D. (1983) Identification of  $\beta$ -Endorphin Residues 14-25 as a Region Involved in the Inhibition of the Calmodulin-Stimulated Phosphodiesterase Activity. *Biochemistry* **22**, 5584-5591.
- 4) Colombo, G., Rajashekhar, B., GIEDROC, D. P., & Villafranca, J.J. (1984) Alternate Substrates of Dopamine- $\beta$ -Hydroxylase. I. Kinetic Investigations of Benzyl Cyanides as Substrates and Inhibitors. *J. Biol. Chem.* **259**, 1593-1600.
- 5) Colombo, G., GIEDROC, D. P., Rajashekhar, B., & Villafranca, J. J. (1984) Alternate Substrates of Dopamine- $\beta$ -Hydroxylase. II. Inhibition by Benzyl Cyanides and Reactivation of Inhibited Enzyme. *J. Biol. Chem.* **259**, 1601-1606.
- 6) Colombo, G., Rajashekhar, B., GIEDROC, D. P., & Villafranca, J. J. (1984) Mechanism-Based Inhibitors of Dopamine- $\beta$ -Hydroxylase: Inhibition by 2-Bromo-3-(*p*-hydroxyphenyl)-1-propene. *Biochemistry* **23**, 3590-3598.
- 7) GIEDROC, D. P., Keravis, T. M., Staros, J. V., Ling, N., Wells, J. N., & Puett, D. (1985) Functional Properties of Covalent  $\beta$ -Endorphin Peptide/Calmodulin Complexes. Chlorpromazine Binding and Phosphodiesterase Activation. *Biochemistry* **24**, 1203-1211.

- 8) GIEDROC, D. P., & Puett, D. (1985) Binding of a Synthetic  $\beta$ -Endorphin Peptide to Calmodulin. *Mol. Pharmacol.* **28**, 588-593.
- 9) GIEDROC, D. P., Sinha, S. K., Brew, K., & Puett, D. (1985) Differential Trace Labeling of Calmodulin: Investigation of Binding Sites and Conformational States by Individual Lysine Reactivities. *J. Biol. Chem.* **260**, 13406-13413.
- 10) GIEDROC, D. P., & Coleman, J.E. (1986) Structural and Functional Differences between the Two Intrinsic Zinc Ions of *Escherichia coli* RNA Polymerase. *Biochemistry* **25**, 4969-4978.
- 11) GIEDROC, D. P., Keating, K. M., Williams, K. R., Konigsberg, W. H., & Coleman, J. E. (1986) Gene 32 Protein, The Single-Stranded DNA Binding Protein from T4, is a Zinc Metalloprotein. *Proc. Natl. Acad. Sci. USA* **83**, 8452-8456.
- 12) GIEDROC, D. P., Puett, D., Sinha, S. K., & Brew, K. (1987) Calcium Effects on Calmodulin Lysine Reactivities. *Arch. Biochem. Biophys.* **252**, 136-144.
- 13) GIEDROC, D. P., Keating, K. M., Williams, K. R., & Coleman, J. E. (1987) The Function of Zinc in Gene 32 Protein from T4. *Biochemistry* **26**, 5251-5259.
- 14) Keating, K. M., Ghosaini, L. R., GIEDROC, D. P., Williams, K. R., Coleman, J. E., & Sturtevant, J.M. (1988) Thermal Denaturation of T4 Gene 32 Protein. The Effects of Zinc Removal and Substitution. *Biochemistry* **27**, 5240-5245.
- 15) GIEDROC, D. P., Johnson, B. A., Armitage, I. M., & Coleman, J. E. (1989) NMR Spectroscopy of  $^{113}\text{Cd(II)}$ -Substituted Gene 32 Protein. *Biochemistry* **28**, 2410-2418.
- 16) Pan, T., GIEDROC, D. P., & Coleman, J. E. (1989)  $^1\text{H}$  NMR Studies of T4 Gene 32 Protein: Effects of Zinc Removal and Reconstitution. *Biochemistry* **28**, 8828-8832.
- 17) GIEDROC, D. P., Khan, R., & Barnhart, K. (1990) Overexpression, Purification, and Characterization of Recombinant T4 Gene 32 Protein<sub>22-301</sub> (g32P-B). *J. Biol. Chem.* **265**, 11444-11455.
- 18) GIEDROC, D. P., Khan, R., & Barnhart, K. (1991) Site-specific 1, $N^6$ -Ethenoadenylated Single-stranded Oligonucleotides as Structural Probes for the T4 Gene 32 Protein-ssDNA Complex. *Biochemistry* **30**, 8230-8242.
- 19) GIEDROC, D. P., Qiu, H., Khan, R., King, G. C., & Chen, K. (1992) Zn(II) Coordination Domain Mutants of T4 Gene 32 Protein. *Biochemistry* **31**, 765-774.
- 20) Khan, R. & GIEDROC, D. P. (1992) Recombinant HIV-1 Nucleocapsid (NCP<sup>7</sup>) Protein Unwinds tRNA. *J. Biol. Chem.* **267**, 6689-6695.
- 21) Dib-Hajj, F., Khan, R., & GIEDROC, D. P. (1993) Retroviral Nucleocapsid Proteins

Possess Potent Nucleic Acid Strand Renaturation Activity. *Prot. Sci.* **2**, 231-243.

- 22) Jiang, H., GIEDROC, D., & Kodadek, T. (1993) The Role of Protein-Protein Interactions in the Assembly of the Presynaptic Filament for T4 Homologous Recombination. *J. Biol. Chem.* **268**, 7904-7911.
- 23) Villemain, J. L., & GIEDROC, D. P. (1993) Energetics of Arginine-4 Substitution Mutants in the N-terminal Cooperativity Domain of T4 Gene 32 Protein. *Biochemistry* **32**, 11235-11246.
- 24) Qiu, H., Kodadek, T. & GIEDROC, D. P. (1994) Zinc-Free and Reduced T4 Gene 32 Protein Binds Single-stranded DNA Weakly and Fails to Stimulate UvsX-Catalyzed Homologous Recombination. *J. Biol. Chem.* **269**, 2773-2781.
- 25) Qiu, H., & GIEDROC, D. P. (1994) Effects of Substitution of Proposed Zn(II) Ligand His-81 or His-64 in Phage T4 Gene 32 Protein: Spectroscopic Evidence for a Novel Zinc Coordination Complex. *Biochemistry* **33**, 8139-8148.
- 26) Khan, R. & GIEDROC, D. P. (1994) Nucleic Acid Binding Properties of Recombinant Zn<sub>2</sub> HIV-1 Nucleocapsid Protein are Modulated by COOH-Terminal Processing. *J. Biol. Chem.* **269**, 22538-22546.
- 27) Peliska, J. A., Balasubramanian, S., GIEDROC, D. P., & Benkovic, S.J. (1994) Recombinant HIV-1 Nucleocapsid Protein Accelerates HIV-1 Reverse Transcriptase Catalyzed DNA Strand Transfer Reactions and Modulates RNase H Activity. *Biochemistry* **33**, 13817-13823.
- 28) Guo, J., Wang, S., Dong, J., Qiu, H., Scott, R. A., & GIEDROC, D. P. (1995) X-ray and Visible Absorption Spectroscopy of Wild-Type and Mutant T4 Gene 32 Proteins: His<sup>64</sup>, not His<sup>81</sup>, is the Non-thiolate Zinc Ligand. *J. Amer. Chem. Soc.* **117**, 9437-9440.
- 29) Qiu, H., Kaluarachchi, K., Du, Z., Hoffman, D. W., & GIEDROC, D. P. (1996) Thermodynamics of Folding of the RNA Pseudoknot of the T4 Gene 32 Autoregulatory Messenger RNA. *Biochemistry* **35**, 4176-4186.
- 30) Du, Z., GIEDROC, D. P., & Hoffman, D. W. (1996) Structure of the Autoregulatory Pseudoknot within the Gene 32 Messenger RNA of Bacteriophages T2 and T6: A Model for a Possible Family of Structurally Related RNA Pseudoknots. *Biochemistry* **35**, 4187-4198.
- 31) Khan, R., Chang, H.-O., Kaluarachchi, K., & GIEDROC, D. P. (1996) Interaction of Retroviral Nucleocapsid Proteins with Transfer RNA<sup>phe</sup>: A Lead Ribozyme and <sup>1</sup>H NMR Study. *Nuc. Acids Res.* **24**, 3568-3575.
- 32) Villemain, J. L. & GIEDROC, D. P. (1996) Characterization of a Cooperativity Domain Mutant Lys<sup>3</sup>→Ala (K3A) T4 Gene 32 Protein. *J. Biol. Chem.* **271**, 27623-27629.
- 33) Rosche, W. A., Jaworski, A., Kang, S., Kramer, S. F., Larson, J. E., GIEDROC, D. P.,

- Wells, R. D., & Sinden, R. R. (1996) Single-stranded DNA-Binding Protein Enhances the Stability of CTG Triplet Repeats in *Escherichia coli*. *J. Bacteriol.* **178**, 5042-5044.
- 34) Villemain, J. L., & GIEDROC, D. P. (1996) The N-terminal Domain of T4 Gene 32 Protein Modulates the Lifetime of Cooperatively Bound Gp32-ss Nucleic Acid Complexes. *Biochemistry* **35**, 14395-14404.
- 35) Guo, J., & GIEDROC, D. P. (1997) Zinc Site Redesign in T4 Gene 32 Protein: Structure and Stability of Co(II)-Complexes Formed by Wild-Type and Metal-Ligand Substitution Mutants. *Biochemistry* **36**, 730-742.
- 36) Liu, M. Y., Gui, G., Wei, B., Preston, J.F. III, Oakford, L., Yükei, Ü., GIEDROC, D. P., & Romeo, T. (1997) The RNA Molecule CsrB Binds to the Global Regulatory Protein CsrA and Antagonizes its Activity in *Escherichia coli*. *J. Biol. Chem.* **272**, 17501-17510.
- 37) Du, Z., Holland, J. A., Hansen, M. R., GIEDROC, D. P., & Hoffman, D. W. (1997) Base Pairings Within the RNA Pseudoknot Associated with the Simian Retrovirus-1 *gag-pro* Frameshift Site. *J. Mol. Biol.* **270**, 464-470.
- 38) Namgoong, S.-Y., Kim, K., Saxena, P., Yang, J.-Y., Jayaram, M., GIEDROC, D. P., & Harshey, R. M. (1997) Mutational Analysis of Domain II□ of Mu Transposase: Domains II□ and II□□ belong to Different Catalytic Complementation Groups. *J. Mol. Biol.* **275**, 221-232.
- 39) Theimer, C. A., Wang, Y., Hoffman, D. W., Krisch, H. M., & GIEDROC, D. P. (1998) Non-Nearest Neighbor Effects on the Thermodynamics of Unfolding of a Model mRNA Pseudoknot. *J. Mol. Biol.* **279**, 545-564.
- 40) Chen, X., Agarwal, A., & GIEDROC, D. P. (1998) Structural and Functional Heterogeneity Among the Zinc-Fingers of Human MRE-Binding Transcription Factor-1 (MTF-1). *Biochemistry* **37**, 11152-11161.
- 41) Gao, Y., Kaluarachchi, K., & GIEDROC, D. P. (1998) Solution Structure and Backbone Dynamics of Mason-Pfizer Monkey Virus (MPMV) Nucleocapsid Protein. *Prot. Sci.* **7**, 2265-2280.
- 42) Nixon, P. L., & GIEDROC, D. P. (1998) Equilibrium Unfolding (Folding) Pathway of a Model H-type Pseudoknotted RNA: The Role of Magnesium Binding in Stability. *Biochemistry* **37**, 16116-16129.
- 43) Theimer, C. A. & GIEDROC, D. P. (1999) Equilibrium Unfolding Pathway of an H-type RNA Pseudoknot which Promotes Programmed -1 Ribosomal Frameshifting. *J. Mol. Biol.* **289**, 1283-1299.
- 44) Nixon, P. L., Theimer, C. A., & GIEDROC, D. P. (1999) Thermodynamics of Stabilization of RNA Pseudoknots by Cobalt(III) Hexamine. *Biopolymers* **50**, 443-458.

- 45) Chen, X., Chu, M., & GIEDROC, D. P. (1999) MRE-Binding Transcription Factor-1: Weak Zinc-Binding Finger Domains 5 and 6 Modulate the Structure, Affinity and Specificity of the Metal-Response Element Complex. *Biochemistry* **38**, 12915-12925.
- 46) Chen, X., Chu, M., & GIEDROC, D. P. (2000) Spectroscopic Characterization of Co(II), Ni(II) and Cd(II)-substituted Wild-Type and Non-native Retroviral Zinc Finger Peptides. *J. Biol. Inorg. Chem.* **5**, 93-101.
- 47) Theimer, C. A. & GIEDROC, D. P. (2000) Contribution of the Intercalated Adenosine at the Helical Junction to the Stability of the gag-pro Frameshifting Pseudoknot from Mouse Mammary Tumor Virus. *RNA* **6**, 409-421.
- 48) Nixon, P. L., & GIEDROC, D. P. (2000) Energetics of a Strongly pH Dependent RNA Tertiary Structure in a Frameshifting Pseudoknot. *J. Mol. Biol.* **296**, 659-671.
- 49) GIEDROC, D. P., Theimer, C. A., & Nixon, P. L. (2000) Structure, Stability and Function of Pseudoknots Involved in Ribosomal Frameshifting. *J. Mol. Biol.* **298**, 167-185 (*invited review*).
- 50) Villemain, J. L., Ma, Y., GIEDROC, D. P., & Morrical, S. M. (2000) Mutations in the N-terminal Cooperativity Domain of Gene 32 Protein Alter Properties of the T4 Replication and Recombination Systems. *J. Biol. Chem.* **275**, 31496-31504.
- 51) VanZile, M. L., Cospers, N., Scott, R. A. & GIEDROC, D. P. (2000) The Zinc Metalloregulatory Protein, *Synechococcus* PCC7942 SmtB, Binds a Single Zinc Ion per Monomer with High Affinity in a Tetrahedral Coordination Geometry. *Biochemistry* **39**, 11818-11829.
- 52) GIEDROC, D. P., Chen, X., & Apuy, J. (2001) Metal-Response Element-Binding Transcription Factor-1 (MTF-1): Structure, Function and Regulation. *Antiox. Redox Signal.* **3**, 577-596 (*invited review*).
- 53) Busenlehner, L. S., Cospers, N. J., Scott, R. A., Rosen, B. P., Wong, M. D. & GIEDROC, D. P. (2001) Spectroscopic Properties of the Metalloregulatory Cd(II) and Pb(II) Sites of *S. aureus* pI258 CadC. *Biochemistry* **40**, 4426-4436.
- 54) GIEDROC, D. P., X. Chen, Pennella, M., & LiWang, A. (2001) Conformational Heterogeneity in the C-Terminal Zinc Fingers of Human MTF-1: An NMR and Zinc Binding Study. *J. Biol. Chem.* **276**, 42322-42332.
- 55) Apuy, J. L., Chen, X., Baldwin, T. O., Russell, D. H., & GIEDROC, D. P. (2001) Ratiometric Pulsed-Alkylation Mass Spectrometry of the Cysteine Pairs in Individual Zinc Fingers of MRE-Binding Transcription Factor-1 (MTF-1) as a Probe of Zinc Chelate Stability. *Biochemistry* **40**, 15164-15175.
- 56) Busenlehner, L. S., Apuy, J. L., & GIEDROC, D. P. (2002) Structural and Functional Characterization of a Metalloregulatory Bi(III) Site in *S. aureus* pI258 CadC. *J. Biol. Inorg. Chem.* **7**, 551-559.

- 57) Busenlehner, L. S., Weng, T.-C., Penner-Hahn, J. E. & GIEDROC, D. P. (2002) Elucidation of Primary ( $\alpha_3N$ ) and Vestigial ( $\alpha_5$ ) Heavy Metal Binding Sites in *S. aureus* pI258 CadC: Evolutionary Implications for Metal Ion Selectivity of ArsR/SmtB Metal Sensor Proteins. *J. Mol. Biol.* **319**, 685-701.
- 58) VanZile, M. L., Chen, X., & GIEDROC, D. P. (2002) Structural Characterization of Distinct  $\alpha_3N$  and  $\alpha_5$  Metal Sites in the Cyanobacterial Zinc Sensor SmtB. *Biochemistry* **41**, 9765-9775.
- 59) VanZile, M. L., Chen, X., & GIEDROC, D. P. (2002) Allosteric Negative Regulation of *smt* O/P Binding of the Zinc Sensor, SmtB, by Metal Ions: A Coupled Equilibrium Analysis. *Biochemistry* **41**, 9776-9786.
- 60) Nixon, P. L., Cornish, P. V., Suram, S. V., & GIEDROC, D. P. (2002) Thermodynamic Analysis of Conserved Loop-Stem Interactions in P1-P2 Frameshifting mRNA Pseudoknots from Plant *Luteoviridae*. *Biochemistry* **41**, 10665-10674.
- 61) Nixon, P. L., Rangan, A., Kim, Y.-G., Rich, A., Hoffman, D. W., Hennig, M., & GIEDROC, D. P. (2002) Solution Structure of a Luteoviral P1-P2 Frameshifting mRNA Pseudoknot. *J. Mol. Biol.* **322**, 621-633.
- 62) Cavet, J. S., Meng, W., Pennella, M. A., Appelhoff, R. J., GIEDROC, D. P., & Robinson, N. J. (2002) A Nickel-Cobalt Sensing ArsR-SmtB Family Repressor: Contributions of the Cytosol and Effector Binding Sites to Metal Selectivity. *J. Biol. Chem.* **277**, 38441-38448.
- 63) Busenlehner, L. S., Pennella, M. A., & GIEDROC, D. P. (2003) The SmtB/ArsR Family of Metalloregulatory Transcriptional Repressors: Structural Insights into Prokaryotic Metal Resistance. *FEMS Microbiol. Rev.* **27**, 131-144 (invited review).
- 64) Pennella, M. A., Shokes, J. E., Cosper, N. J., Scott, R. A., & GIEDROC, D. P. (2003) Structural Elements of Metal Selectivity in Metal Sensor Proteins. *Proc. Natl. Acad. Sci. USA* **100**, 3713-3718.
- 65) GIEDROC, D. P., Cornish, P. V., & Hennig, M. A. (2003) Detection of Scalar Couplings Involving 2'-Hydroxyl Protons Across Hydrogen Bonds in a Frameshifting RNA Pseudoknot. *J. Am. Chem. Soc.* **125**, 4676-4677.
- 66) Eicken, C., Pennella, M. A., Chen, X., Koshlap, K., VanZile, M. L., Sacchettini, J. C., & GIEDROC, D. P. (2003) A Metal-Ligand mediated Intersubunit Allosteric Switch in Related SmtB/ArsR Zinc Sensor Proteins. *J. Mol. Biol.* **333**, 683-695.
- 67) Chen, X., Zhang, B., Harmon, P. M., Schaffner, W., Peterson, D. O., & GIEDROC, D. P. (2004) A Novel Cysteine Cluster in Human MTF-1 is Required for Heavy Metal-induced Transcriptional Activation *in vivo*. *J. Biol. Chem.* **279**, 4515-4522.

- 68) Apuy, J. A., Busenlehner, L. S., Russell, D. H., & GIEDROC, D. P. (2004) Ratiometric Pulsed Alkylation-Mass Spectrometry as a Probe of Thiolate Reactivity in Different Metalloderivatives of *S. aureus* pI258 CadC *Biochemistry* **43**, 3824-3834.
- 69) Ma, Y., Wang, T., Villemain, J. L., GIEDROC, D. P., & Morrical, S. W. (2004) Dual Functions of Single-stranded DNA-binding Protein in Helicase Loading at the Bacteriophage T4 Replication Fork. *J. Biol. Chem.* **279**, 19035-19045.
- 70) Liu, T., Nakashima, S., Hirose, K., Shibasaka, M., Katsuhara, M., Ezaki, B., GIEDROC, D. P., & Kasamo, K. (2004) A Novel Cyanobacterial SmtB/ArsR Family Metalloregulator Regulates a CPx-ATPase and a Metallothionein in Response to both Cu(I)/Ag(I) and Zn(II)/Cd(II). *J. Biol. Chem.* **279**, 17810-17818.
- 71) Pennella, M. A., & GIEDROC, D. P. (2005) Structural Determinants of Metal Selectivity in Prokaryotic Metal-Responsive Transcriptional Regulators. *Biometals* **18**, 413-428 (invited review).
- 72) Liu, T., Golden, J. W., & GIEDROC, D. P. (2005) A Zn(II)/Pb(II)/Cd(II)-Inducible Operon from *Anabaena* is Regulated by AztR, an  $\alpha$ 3N ArsR/SmtB-family Metalloregulator. *Biochemistry* **44**, 8673-8683.
- 73) Wang, Y., & Hemmingsen, L., & GIEDROC, D. P. (2005) Structural and Functional Characterization of *M. tuberculosis* CmtR, a Pb(II)/Cd(II)-sensing SmtB/ArsR Metalloregulatory Repressor. *Biochemistry* **44**, 8976-8988.
- 74) Cornish, P.V., Hennig, M., & GIEDROC, D. P. (2005) A Loop 2 Cytidine-Stem 1 Minor Groove Interaction as a Positive Determinant for Pseudoknot-Stimulated -1 Ribosomal Frameshifting. *Proc. Natl. Acad. Sci. USA* **102**, 12694-12699.
- 75) Pennella, M.A., Arunkumar, A.I., & GIEDROC, D. P. (2006) Individual Metal Ligands Play Distinct Functional Roles in the Zinc Sensor *Staphylococcus aureus* CzrA. *J. Mol. Biol.* **356**, 1124-1136.
- 76) Lee, S., Arunkumar, A.I., Chen, X., & GIEDROC, D. P. (2006) Structural Insights into Homo- and Heterotropic Allosteric Coupling in the Zinc Sensor *S. aureus* CzrA from Covalently Fused Dimers. *J. Am. Chem. Soc.* **128**, 1937-1947.
- 77) Busenlehner, L.S., and GIEDROC, D. P. (2006) Kinetics of Metal Binding by the Toxic Metal-Sensing Transcriptional Repressor *S. aureus* pI258 CadC. *J. Inorg. Biochem* **100**, 1024-1034.
- 78) Cornish, P. V. GIEDROC, D. P. & Hennig, M. (2006) Dissecting non-canonical interactions in frameshift-stimulating mRNA pseudoknots. *J. Biomol. NMR* **35**, 209-223.
- 79) Cornish, P. V. & GIEDROC, D. P. (2006) Pairwise coupling analysis of helical junction hydrogen bonding interactions in luteoviral RNA pseudoknots. *Biochemistry* **45**, 11162-11171.

- 80) Cornish, P. V., Stammler, S. N. & GIEDROC, D. P. (2006) The global structures of a wild-type and poorly functional plant luteoviral mRNA pseudoknot are essentially identical. *RNA* **12**, 1959-1969.
- 81) Kang, H., Feng, M., Schroeder, M. E., GIEDROC, D. P., & Leibowitz, J. L. (2006) *Cis*-acting stem-loops in the 5' untranslated region of the severe acute respiratory syndrome coronavirus can substitute for their MHV counterparts. *J. Virol.* **80**, 10600-10614.
- 82) Liu, T., Ramesh, A., Ma, Z, Ward, S. K., Zhang, L., George, G. N., Talaat, A. M., Sacchettini, J. C., & GIEDROC, D. P. (2007) CsoR is a novel *Mycobacterium tuberculosis* copper-sensing transcriptional regulator. *Nature Chem. Biol.* **3**, 60-68.
- 83) Liu, P., Li, L., Millership, J. J., Leibowitz, J. L., & GIEDROC, D. P. (2007) A U-turn motif-containing stem-loop in the coronavirus 5' untranslated region (UTR) plays a functional role in replication. *RNA* **13**, 763-780.
- 84) Arunkumar, A. I., Pennella, M. A., Kong, X., and GIEDROC, D. P. (2007) Resonance assignments of the metal sensor CzrA in the apo-, Zn<sup>2+</sup>- and DNA-bound (42 kDa) states. *Biomol. NMR Assign* **1**, 99-101.
- 85) GIEDROC, D. P. and Arunkumar, A. I. (2007) Metal Sensor Proteins: Nature's metalloregulated allosteric switches. *Dalton Trans.*, 3107-3120 (*invited Perspective*).
- 86) Liu, T., Reyes, H., Li, C., Li, C., Scott, R. A., & GIEDROC, D. P. (2007) Multiple metal-binding domains enhance the Zn(II) selectivity of the divalent metal ion transporter AztA. *Biochemistry* **46**, 11057-11068.
- 87) Li, L., Kang, H., Liu, P., Makkinje, N., Williamson, S. T., Leibowitz, J. L., and GIEDROC, D. P. (2008) Structural lability in stem-loop 1 drives a 5' UTR-3' UTR interaction in coronavirus replication. *J. Mol. Biol.* **377**, 790-803.
- 88) Chen, X., Hua, H., Balamurugan, K., Kong, X., Wang, L., George, G. N., Georgiev, O., Schaffner, W. and GIEDROC, D. P. (2008) Copper sensing by *Drosophila* metal-responsive transcription factor-1 requires a Cu(I)<sub>4</sub>-S<sub>6</sub> cluster. *Nucl. Acids Res.* **36**, 3128-3138.
- 89) Tang, X., Thomas, S., Tapia, L., GIEDROC, D. P., & Amato, N. M. (2008) Simulating RNA folding kinetics on approximated energy landscapes. *J. Mol. Biol.* **381**, 1055-1067.
- 90) Liu, T., Chen, X., Ma, Z., Shokes, J., Hemmingsen, L., Scott, R. A., & GIEDROC, D. P. (2008) A Cu(I)-sensing ArsR-family Metal Sensor Protein with a Relaxed Metal Selectivity Profile. *Biochemistry* **47**, 10564-10575.
- 91) GIEDROC, D. P. and Cornish, P. V. (2009) Frameshifting RNA pseudoknots: structure and mechanism. *Vir. Res.* **139**, 193-208 (*invited review*).
- 92) Ma, Z., Cowart, D., Scott, R. A. & GIEDROC, D. P. (2009) Molecular insights into the



metal selectivity of the Cu(I)-sensing repressor CsoR from *Bacillus subtilis*. *Biochemistry* **48**, 3325-3334.

93) Zheng, M., Cooper, D. R., Grosseohme, N. E., Yu, M., Hung, L. W., Cieslik, M., Derewenda, U., Lesley, S. A., Wilson, I. A., GIEDROC, D. P., Derewenda, Z. S. (2009) Structure of *Thermotoga maritima* TM0439: Implications for the mechanism of bacterial GntR transcription regulators with Zn<sup>2+</sup>-binding FCD domains. *Acta Cryst* **65**, 356-365.

94) GIEDROC, D. P. (2009) Hydrogen peroxide sensing in *Bacillus subtilis*: it is all about the (metallo)regulator. *Mol. Micro.* **73**, 1-4 (Invited commentary)

95) Ma, Z., Jacobsen, F. E., & GIEDROC, D. P. (2009) Coordination chemistry of bacterial metal transport and sensing. *Chem. Rev.* **109**, 4644-4681.

96) Arunkumar, A. I., Campanello, G. C. & GIEDROC, D. P. (2009) Solution structure of a paradigm ArsR family sensor in the DNA bound state. *Proc. Natl. Acad. Sci. U. S. A.* **106**, 18177-18182.

97) Lui, P., Li, L., Keane, S. C., Yang, D., Leibowitz, J. L. & GIEDROC, D. P. (2009) Mouse hepatitis virus stem-loop 2 adopts an uYNMG(U)a-like tetraloop structure that is highly functionally tolerant of base substitutions. *J. Virol.* **83**, 12084-12093.

98) Dragnea, V., Arunkumar, A. I., Yuan, H., GIEDROC, D. P., & Bauer, C. E. Spectroscopic Studies of the AppA BLUF Domain from *Rhodobacter sphaeroides*: Addressing Movement of Trp104 in the Signaling State. *Biochemistry* **48**, 9969-9979.

99) Grosseohme, N. E., Li, L., Keane, S. C., Liu, P., Dann, C. E., III, Leibowitz, J. L., & GIEDROC, D. P. (2009) Coronavirus N protein N-terminal domain (NTD) specifically binds the transcriptional regulatory sequence (TRS) and melts TRS-cTRS RNA duplexes. *J. Mol. Biol.* **394**, 544-557.

100) Grosseohme, N. E., & GIEDROC, D. P. (2009) Energetics of allosteric negative coupling in the zinc sensor *S. aureus* CzxA. *J. Am. Chem. Soc.* **131**, 17860-17870.

101) Ma, Z., Cowart, D. M., Ward, B. P., Arnold, R. J., DiMarchi, R. D., Zhang, L., George, G. N., Scott, R. A., & GIEDROC, D. P. (2009) Unnatural amino acid substitution as a probe of the allosteric coupling pathway in a mycobacterial Cu(I) sensor. *J. Am. Chem. Soc.* **131**, 18044-18045.

102) Cao, S., GIEDROC, D. P., & Chen, S.-J. (2010) Predicting loop-helix tertiary structural contacts in RNA pseudoknots. *RNA* **16**, 538-552.

103) Wang, Y., Kendall, J., Cavet, J. S., & GIEDROC, D. P. (2010) Elucidation of the functional metal binding profile of a Cd(II)/Pb(II) sensor CmtR(Sc) from *Streptomyces coelicolor*. *Biochemistry* **49**, 6617-6626.

104) Reyes-Caballero, H., Guerra, A. J., Jacobsen, F. E., Kazmierczak, K. M., Cowart, D.,

- Koppolu, U. M., Scott, R. A., Winkler, M. E., & GIEDROC, D. P. (2010) The metalloregulatory zinc site in *Streptococcus pneumoniae* AdcR, a zinc-activated MarR family repressor. *J. Mol. Biol.* **403**, 197-216.
- 105) Dragnea, V., Arunkumar, A. I., Lee, C. W., GIEDROC, D. P., & Bauer, C. E. (2010) A Q63E *Rhodobacter sphaeroides* AppA BLUF domain mutant is locked in a pseudo-light-excited signaling state. *Biochemistry* **49**, 10682-10690.
- 106) Sommer, F., Kropat, J., Malasarn, D., Grosseohme, N. E., Chen, X., GIEDROC, D. P., Merchant, S. S. (2010) The CRR1 Nutritional Copper Sensor in *Chlamydomonas* Contains Two Distinct Metal-Responsive Domains. *Plant Cell.* **22**, 4098-4113.
- 107) Jacobsen, F. E., Kazmierczak, K. M., Lisher, J. P., Winkler, M. E., & GIEDROC, D. P. (2011) Interplay between manganese and zinc homeostasis in the human pathogen *Streptococcus pneumoniae*. *Metallomics* **3**, 38-41.
- 108) Lee, C. W., Li, L., & GIEDROC, D. P. (2011) The solution structure of coronaviral stem-loop 2 (SL2) reveals a canonical CUYG tetraloop fold. *FEBS Lett.* **585**, 1049-1053
- 109) Grosseohme, N. E., Kehl-Fie, T. E., Ma, Z., Adams, K. W., Cowart, D. M., Scott, R. A., Skaar, E. P., & GIEDROC, D. P. (2011) Control of copper resistance and inorganic sulfur metabolism by paralogous regulators in *Staphylococcus aureus*. *J. Biol. Chem.* **286**, 13522-13531
- 110) Reyes-Caballero, H., Campanello, G. C, & GIEDROC, D. P. (2011) Metalloregulatory Proteins: Metal Selectivity and Allosteric Switching. *Biophys. Chem.* **156**, 103-114 (invited review).
- 111) Stammler, S. N., Cao, S., Chen, S.-J. & GIEDROC, D. P. (2011) A conserved RNA pseudoknot in a proposed molecular switch domain of the 3' untranslated region of coronaviruses is only marginally stable. *RNA* **17**, 1747-1759.
- 112) Reyes-Caballero, H., Lee, C. W. & GIEDROC, D. P. (2011) *Mycobacterium tuberculosis* NmtR harbors a nickel sensing site with parallels to *Escherichia coli* RcnR. *Biochemistry* **50**, 7941-7952
- 113) Yang, D., Lui, P., GIEDROC, D. P. & Leibowitz, J. L. (2011) Mouse Hepatitis Virus Stem-Loop 4 Functions as a Spacer Element Required to Drive Subgenomic RNA Synthesis. *J. Virol.* **85**, 9199-9209.
- 114) Chang, F.-M., Lauber, M. A., Running, W. E., Reilly, J. P., & GIEDROC, D. P. (2011) Ratiometric Pulse-chase Amidation Mass Spectrometry as a Probe of Biomolecular Complex Formation. *Anal. Chem.* **83**, 9092-9099.
- 115) Guerra, A. J., Dann, C. E., III, & GIEDROC, D. P. (2011) Crystal Structure of the Zinc-dependent MarR Family Transcriptional Regulator AdcR in the Zn(II)-bound State. *J. Am. Chem. Soc.* **133**, 19614-19617.

- 116) Chakravorty, D., Wang, B., Lee, C. W., GIEDROC, D. P.\*, & Merz, K. (2012) Simulations of Allosteric Motions in the Zinc Sensor CzrA. *J. Am. Chem. Soc.* **134**, 3367-3376.
- 117) Guerra, A. J., & GIEDROC, D. P. (2012) Metal site occupancy and allosteric switching in bacterial metal sensor proteins. *Arch. Biochem. Biophys.* **519**, 210-222 (Invited review for themed issue on *Allostery*)
- 118) Keane, S. C., Liu, P., Leibowitz, J. L. & GIEDROC, D. P. (2012) Functional transcriptional regulatory sequence (TRS) RNA binding and helix destabilizing determinants of the murine hepatitis virus (MHV) nucleocapsid (N) protein. *J. Biol. Chem.* **287**, 7063-7067.
- 119) Lee, C. W., Chakravorty, D. K., Chang, F.-M., Reyes-Caballero, H., Ye, Y., Merz, K. M., Jr., and GIEDROC, D. P. (2012) Solution structure of *Mycobacterium tuberculosis* NmtR in the apo-state: Insights into Ni(II)-mediated allostery. *Biochemistry* **51**, 2619-2629.
- 120) Guerra, A. J., and GIEDROC, D. P. (2012) Backbone and stereospecific methyl side chain resonance assignments of the homodimeric zinc sensor AdcR (32 kDa) in the apo- and Zn(II)-bound states. *Biomol NMR Assign* **8**, 11-14 (doi: 10.1007/s12104-012-9442-6)
- 121) Keane, S. C. and GIEDROC, D. P. (2012) <sup>1</sup>H, <sup>13</sup>C, <sup>15</sup>N resonance assignments of murine hepatitis virus nonstructural protein 3a. *Biomol NMR Assign*, **8**, 15-17 (doi: 10.1007/s12104-012-9443-5).
- 122) Lee, C. W., and GIEDROC, D. P. (2013) <sup>1</sup>H, <sup>13</sup>C, and <sup>15</sup>N resonance assignments of NmtR, a Ni(II)/Co(II) metalloregulatory protein of *Mycobacterium tuberculosis*. *Biomol NMR Assign.* **7**, 145-148.
- 123) Coyne, H. J., III and GIEDROC, D. P. (2013) Backbone resonance assignments of the homotetrameric (48 kD) copper sensor CsoR from *Geobacillus thermodenitrificans* in the apo- and Cu(I)-bound states: Insights into copper-mediated allostery. *Biomol NMR Assign.* **7**, 279-283.
- 124) Chakravorty, D. K., Parker, T. M., Guerra, A. J., Sherrill, D. C., GIEDROC, D. P.\* and Merz, K. M., Jr. (2013) Energetics of zinc-mediated interactions in the allosteric pathways of metal sensor proteins. *J. Am. Chem. Soc.* **135**, 30-33.
- 125) Fu, Y., Tsui, H.-C., Bruce, K. E., Sham, L.-T., Higgins, K. A., Lisher, J. P., Kazmierczak, K. M., Maroney, M. J., Dann, C. E., III, Winkler, M. E., and GIEDROC, D. P. (2013) A new structural paradigm in copper resistance in *Streptococcus pneumoniae*. *Nat. Chem. Biol.* **9**, 177-183.
- 126) Keane, S. C., and GIEDROC, D. P. (2013) Solution structure of mouse hepatitis virus (MHV) nsp3a and determinants of the interaction with MHV nucleocapsid (N) protein. *J. Virol.* **87**, 3502-3215.
- 127) Campanello, G. C. Ma, Z., Grosseohme, N. E., Guerra, A. J., Ward, B. P., DiMarchi, R. D., Yu, Y., Dann, C. E., III, GIEDROC, D. P. (2013) Allosteric inhibition of a zinc-sensing transcriptional repressor: Insights into the arsenic repressor (ArsR) family. *J. Mol. Biol.* **425**,

1143-1157.

128) Luebke, J. L., Arnold, R. J., and GIEDROC, D. P. (2013) Selenite and tellurite form mixed seleno- and tellurotrisulfides with CstR from *Staphylococcus aureus*. *Metallomics* **5**, 335-342.

129) Chakravorty, D. K., Wang, B., Lee, C. W., Guerra, A. J., GIEDROC, D. P.\*, and Merz, K.M., Jr. (2013) Solution NMR refinement of a metal ion bound protein using metal ion inclusive restrained molecular dynamics methods. *J. Biomol. NMR* **56**, 125-137.

130) Lisher, J. P., Higgins, K. A., Maroney, M. J., and GIEDROC, D. P. (2013) Physical Characterization of the Manganese-Sensing Pneumococcal Surface Antigen Repressor from *Streptococcus pneumoniae*. *Biochemistry* **52**, 7689-7701.

131) Hughes, H. V., Lisher, J. P., Hardy, G. G., Kysela, D. T., Arnold, R. J., GIEDROC, D. P., and Brun, Y. V. (2013) Co-ordinate synthesis and protein localization in a bacterial organelle by the action of a penicillin-binding-protein. *Mol. Microbiol.* **90**, 1162-1177.

132) Lisher, J. P. and GIEDROC, D. P. (2013) Manganese acquisition and homeostasis at the host-pathogen interface. *Front. Cell. Infect. Microbiol.* **3**, 91-115.

133) Higgins, K. A., and GIEDROC, D. P. (2014) *Highlight Review*: Insights into protein allostery in the CsoR/RcnR family of transcriptional repressors *Chem. Lett.* **43**, 20-25.

134) Braymer, J. J., and GIEDROC, D. P. (2014) Recent developments in copper and zinc homeostasis in bacterial pathogens. *Curr. Opin. Chem. Biol.* **19**, 59-66 (*invited*).

135) Chang, F.-M. J., Coyne III, H. J., Ramirez, C. A. C., Fleischmann, P. V., Fang, X., Ma, Z., Ma, D., Helmann, J. D., García-de los Santos, A., Wang, Y.-X., Dann III, C. E., and GIEDROC, D. P. (2014) Cu(I)-mediated allosteric switching in a copper-sensing operon repressor (CsoR). *J. Biol. Chem.* **289**, 19204-19217.

136) Reeves, B. D., Joshi, N., Campanello, G. C., Hilmer, J., Spicka, K., Chetia, L., Vance, J. A., GIEDROC, D. P., Dratz, E. A., Singel, D. J., and Grieco, P. A. (2014) Conversion of *S*-phenylsulfonyleysteine residues to mixed disulfides at pH 4.0: Utility in protein thiol blocking and in protein *S*-nitrosothiol detection. *Org. Biomol. Chem.* **12**, 7942-7956.

137) Fu, Y., Chang, F.-M. J., and GIEDROC, D. P. (2014) Copper transport and trafficking at the host-bacterial pathogen interface. *Acc. Chem. Res.* **47**, 3605-3613 (*invited*).

138) Luebke, J. L., Shen, J., Bruce, K. E., Kehl-Fie, T. E., Peng, H., Skaar, E. P. and GIEDROC, D. P. (2014) The CsoR-like sulfurtransferase repressor (CstR) is a persulfide sensor in *Staphylococcus aureus*. *Mol. Microbiol.* **94**, 1343-1360.

139) Yang, D., Liu, P., Wudeck, E. V., GIEDROC, D. P., and Leibowitz, J. L. (2015) SHAPE analysis of the RNA secondary structure of the Mouse Hepatitis Virus 5' untranslated region and N-terminal nsp1 coding sequences. *Virology* **475**, 15-27.

- 140) Higgins, K. A., Peng, H., Luebke, J. L., Chang, F.-M. J., and GIEDROC, D. P. (2015) Conformational analysis and chemical reactivity of the multidomain sulfurtransferase, *Staphylococcus aureus* CstA. *Biochemistry* **54**, 2385-2398.
- 141) Chang, F.-M. J., Martin, J. E., and GIEDROC, D. P. (2015) Electrostatic occlusion and quaternary structural ion pairing are key determinants of Cu(I)-mediated allostery in the copper-sensing operon repressor (CsoR). *Biochemistry* **54**, 2463-2372.
- 142) Luebke, J. L., and GIEDROC, D. P. (2015) *Current Topics*: Cysteine sulfur chemistry in transcriptional regulators at the host-bacterial pathogen interface. *Biochemistry* **54**, 3235-3249.
- 143) Shen, J., Keithly, M. E., Armstrong, R. N., Higgins, K. A., Edmonds, K. A., and GIEDROC, D. P. (2015) *Staphylococcus aureus* CstB is a novel multidomain persulfide dioxygenase-sulfurtransferase involved in hydrogen sulfide detoxification. *Biochemistry* **54**, 4542-4554.
- 146) Jacobs, A. D., Chang, F.-M., Morrison, L., Dilger, D. M., Wysocki, V. H., Clemmer, D. E., and GIEDROC, D. P. (2015) Resolution of stepwise cooperativities of copper binding by the homotetrameric copper sensitive operon repressor (CsoR): Impact on structure and stability. *Angew. Chem. Int. Ed.* **54**, 12795-12799.
- 147) Fu, Y., Bruce, K. E., Rued, B., Winkler, M. E., & GIEDROC, D. P. (2016) <sup>1</sup>H, <sup>13</sup>C, <sup>15</sup>N resonance assignments of the extracellular loop 1 domain (ECL1) of *Streptococcus pneumoniae* D39 FtsX, an essential cell division protein. *Biomol NMR Assign.* **10**, 89-92 (PMC4789122).
- 148) Fu, Y., Bruce, K. E., Wu, H., and GIEDROC, D. P. (2016) The S2 Cu(I) site in CupA from *Streptococcus pneumoniae* is required for cellular copper resistance. *Metallomics* **8**, 61-70 (PMC4720546) *Cover article*.
- 149) Rutherford, S. A., Chumber, N. M., Zhang, Z., Lisher, J. P., Farquhar, E., GIEDROC, D. P., Spiller, B. W., Melnyk, R. A., and Lacy, D. B. (2016) Structural analysis of *Clostridium difficile* Toxin A. *Nat Microbiol* **1**, article number: 15002.
- 150) Martin, J. E., and GIEDROC, D. P. (2016) Functional determinants of metal ion transport and selectivity in paralogous cation diffusion facilitator transporters CzcD and MntE in *Streptococcus pneumoniae*. *J Bacteriol.* **198**, 1066-1076.
- 151) Nairn, B. L., Lonergan, Z. R., Wang, J., Braymer, J. J., Zhang, Y., Calcutt, M. W., Gilston, B. A., Chazin, W. J., de Crécy-Lagard V., GIEDROC, D. P.\*, and Skaar, E. P.\* (2016) The response of *Acinetobacter baumannii* to zinc starvation. *Cell Host Microbe* **19**, 826-836.
- 152) Capdevila, D. A., Wang, J. and GIEDROC, D. P. (2016) Bacterial strategies to maintain zinc metallostasis at the host-pathogen interface. *J Biol Chem.* **291**, 20858-20868.
- 153) Shen, J., Peng, H., Zhang, Y., Trinidad, J. C., and GIEDROC, D. P. (2016) *Staphylococcus*

*aureus* *sqr* encodes a type II sulfide:quinone oxidoreductase (SQR) and impacts reactive sulfur speciation in cells. *Biochemistry* **55**, 6524-6534.

154) Lisher, J. P., Ramos-Montañez S., Hentchel, K. L. Tsui- T.-H., Winkler, M. E. and GIEDROC, D. P. (2017) Biological and chemical adaptation to endogenous hydrogen peroxide production in *Streptococcus pneumoniae* D39. *mSphere* **2**, e00291-16 (doi: 10.1128/mSphere.00291-16).

155) Martin, J. E. Lisher, J. P., Winkler, M. E., and GIEDROC, D. P. (2017) Perturbation of manganese metabolism disrupts cell division in *Streptococcus pneumoniae*. *Mol. Microbiol.* **104**, 334-348 (doi: 10.1111/mmi.13630).

156) Shimizu, T., Shen, J., Fang, M., Zhang, Y., Hori, K., Trinidad, J. C., Bauer, C. E., GIEDROC, D. P. and Masuda, S. (2017) The sulfide-responsive transcriptional repressor SqrR functions as a master regulator of sulfide-dependent photosynthesis. *Proc. Natl. Acad. Sci. U.S.A.* **114**, 2355-2360 (doi: 10.1073/pnas.1614133114)

157) Martin, J. E., Edmonds, K. A., Bruce, K. E., Campanello, G. C., Eijkelkamp, B. A., Brazel, E. B., McDevitt, C. A., Winkler, M. E., and GIEDROC, D. P. (2017) The pneumococcal zinc efflux activator SczA protects *Streptococcus pneumoniae* serotype 2 D39 from intracellular zinc toxicity. *Mol. Microbiol.* **104**, 636-651 (doi: 10.1111/mmi.13654).

158) Capdevila, D. A., Edmonds, K. A. and GIEDROC, D. P. (2017) Metallochaperones and metalloregulation in bacteria. *Essays Biochem* **61**, 177-200 (doi: 10.1042/EBC20160076).

159) Capdevila, D. A., Braymer, J. J., Edmonds, K. A., Wu, H., and GIEDROC, D. P. (2017) Entropy redistribution controls allostery in a zinc metalloregulatory protein. *Proc. Natl. Acad. Sci. U.S.A.* **114**, 4424-4429 (doi:10.1073/pnas.1620665114).

160) GIEDROC, D. P. (2017) A new player in sulfide-inducible transcriptional regulation in bacteria. *Mol. Microbiol.* **105**, 347-352. (doi: 10.1111/mmi.13726) (*Invited MicroCommentary*).

161) Peng, H., Shen, J., Edmonds, K. A., Luebke, J. L., Chang, F.-M. J., Bruce, K. A., and GIEDROC, D. P. (2017) Sulfide stress and nitroxyl intersect via the formation of reactive sulfur species (RSS) in *Staphylococcus aureus*. *mSphere* **2**, e00082-17 (doi: 10.1128/mSphere.00082-17).

162) Peng, H., Zhang, Y., Luebke, J. L., Palmer, L. D., Edmonds, K. A., Kehl-Fie, T., E., Skaar, E. P., and GIEDROC, D. P. (2017) Hydrogen sulfide (H<sub>2</sub>S) and reactive sulfur species (RSS) impact proteome S-sulfhydration and global virulence regulation in *Staphylococcus aureus*. *ACS Infect Dis* **3**, 744-755 (doi: 10.1021/acsinfecdis.7b00090).

163) Glauninger, H., Zhang, Y., Higgins, K. A., Jacobs, A. D., Martin, J. E., Fu, Y., Coyne, H. J. 3rd, Bruce, K. E., Maroney, M. J., Clemmer, D. E., Capdevila, D. A., and GIEDROC, D. P. (2018) Metal-dependent allosteric activation and inhibition on the same molecular scaffold: The copper sensor CopY from *Streptococcus pneumoniae*. *Chem. Sci.* **9**, 105-118 (doi: 10.1039/C7SC04396A).

164) Capdevila, D. A., Edmonds, K. A., Campanello, G. C., Wu, H., Gonzalez-Gutierrez, G., and GIEDROC, D. P. (2018) Functional role of solvent entropy and conformational entropy of metal binding in a dynamically driven allosteric system. *J. Am. Chem. Soc.* **140**, 9108-9119. (doi: 10.1021/jacs.8b02129).

165) Shen, J., Walsh, B. J. C., Flores-Mireles, A. L., Peng, H., Zhang, Y., Zhang, Y., Trinidad, J. C., Hultgren, S. J., and GIEDROC, D. P. (2018) Hydrogen Sulfide Sensing through Reactive Sulfur Species (RSS) and Nitroxyl (HNO) in *Enterococcus faecalis*. *ACS Chem. Biol.* **13**, 1610-1620 (doi: 10.1021/acscchembio.8b00230).

166) Capdevila, D. A., Huerta, F., Edmonds, K. A., Le, M. T., Wu, H., GIEDROC, D. P. (2018) Tuning site-specific dynamics to drive allosteric activation in a pneumococcal zinc uptake regulator. *Elife* **7**, pii: e37268 (doi: 10.7554/eLife.37268).

167) Peng, H., Zhang, Y., Trinidad, J. C., and GIEDROC, D. P. (2018) Thioredoxin profiling of multiple thioredoxin-like proteins in *Staphylococcus aureus*. *Front. Microbiol.* **9**, 2385 (doi: 10.3389/fmicb.2018.02385).

168) Rued, B. E., Alcorlo, M., Edmonds, K. A., Martínez-Caballero, S., Straume, D., Fu, Y., Bruce, K. E., Wu, H., Håvarstein, L. S., Hermoso, J. A., Winkler, M. E., and GIEDROC, D. P. (2019) Structure of the large extracellular loop of FtsX and its interaction with the essential peptidoglycan hydrolase PcsB in *Streptococcus pneumoniae*. *mBio* **10**, pii: e02622-18 (doi: 10.1128/mBio.02622-18).

169) Wang, J., Lonergan, Z. R., Gonzalez-Gutierrez, G., Nairn, B. L., Maxwell, C. N., Zhang, Y., Andreini, C., Karty, J. A., Chazin, W. J., Trinidad, J. C., Skaar, E. P., and GIEDROC, D. P. (2019) Multi-metal restriction by calprotectin impacts de novo flavin biosynthesis in *Acinetobacter baumannii*. *Cell Chem. Biol.* **16**, 745-755.e7. (doi: 10.1016/j.chembiol.2019.02.011).

170) Lonergan, Z. R., Nairn, B. L., Wang, J., Hsu, Y.-P., Hesse, L. E., Beavers, W. N., Chazin, W. J., Trinidad, J. C., VanNieuwenhze, M. S., GIEDROC, D. P., and Skaar, E. P. (2019) An *Acinetobacter baumannii* zinc regulated peptidase maintains cell wall integrity during immune-mediated nutrient sequestration. *Cell Rep.* **26**, 2009-2018.e6. (doi:10.1016/j.celrep.2019.01.089).

171) Martin, J. E., Le, M. T., Bhattarai, N., Capdevila, D. A., Shen, J., Winkler, M. E. and GIEDROC, D. P. (2019) A Mn-sensing riboswitch activates expression of a Mn<sup>2+</sup>/Ca<sup>2+</sup> ATPase transporter in *Streptococcus*. *Nucl. Acids Res.* **47**, 6885–6899 (doi: 10.1093/nar/gkz494).

172) Jordan, M. R., Wang, J., Weiss, A., Skaar, E. P., Capdevila, D. A., and GIEDROC, D. P. (2019) Mechanistic Insights into the Metal-Dependent Activation of Zn<sup>II</sup>-Dependent Metallochaperones. *Inorg. Chem.* **58**, 13661-13672 (doi: 10.1021/acs.inorgchem.9b01173).

173) Jordan, M. R., Wang, J., Capdevila, D. A., and GIEDROC, D. P. (2020) Multi-metal nutrient restriction at the host-microbial pathogen interface. *Curr Opin Microbiol* **55**, 17-25 (doi pending) (*Invited review*)

- 174) Zhang, Y., Sen, S., and GIEDROC, D. P. *Concepts: Iron Acquisition by Bacterial Pathogens: Beyond tris-Catecholate Complexes. ChemBioChem* **21**, 1955-1967 (doi: 10.1002/cbic.201900778)
- 175) Edmonds, K. A., Zhang, Y., Raines, D. J., Duhme-Klair, A.-K., and GIEDROC, D. P. (2020)  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$  backbone resonance assignments of the apo and holo forms of the ABC transporter solute binding protein PiuA from *Streptococcus pneumoniae*. *Biomolec NMR Assign*, in the press (doi: 10.1007/s12104-020-09952-9)
- 176) Knippel, R. J., Wexler, A. G., Miller, J. M., Beavers, W. N., Weiss, A., de Crécy-Lagard, V., Edmonds, K. A., GIEDROC, D. P. and Skaar, E. O. (2020) *Clostridioides difficile* Senses and Hijacks Host Heme for Incorporation into an Oxidative Stress Defense System. *Cell Host Microbe*, in the press (doi: 10.1016/j.chom.2020.05.015)
- 177) Walsh, B. J. C., Wang, J., Edmonds, K.A., Palmer, L. D., Zhang, Y., Trinidad, J. C., Skaar, E. P., and GIEDROC, D. P. (2020) The response of *Acinetobacter baumannii* to hydrogen sulfide reveals two independent persulfide-sensing systems and a connection to biofilm regulation. *mBio* **11**, e01254-20 (doi: 10.1128/mBio.01254-20).
- 178) Jung, J. K., Alam, K. K., Verosloff, M. S., Capdevila, D. A., Desmau, M., Clauer, P. R., Lee, J. W., Nguyen, P. Q., Pasten, P. A., Matiasek, S., Gaillard, J.-F., GIEDROC, D. P., Collins, J. J., and Lucks, J. B. (2020) Cell-free biosensors for detection of water contaminants. *Nat Biotech*, in the press (doi: 10.1038/s41587-020-0571-7).
- 179) Ray, A., Edmonds, K. A., Palmer, L. D., Skaar, E. P., and GIEDROC, D. P. (2020) *Staphylococcus aureus* glucose-induced biofilm accessory protein A (GbaA) is a monothiol-dependent electrophile sensor. *Biochemistry* **58**, 2882-2895 (doi: 10.1021/acs.biochem.0c00347).
- 180) Walsh, B. J. C., and GIEDROC, D. P. (2020)  $\text{H}_2\text{S}$  and reactive sulfur signaling at the host-bacterial pathogen interface. *J. Biol. Chem.*, in the press (doi: 10.1074/jbc.REV120.011304).
- 181) Zhang, Y., Edmonds, K. A., Raines, D. J., Murphy, B. A., Wu, H., Guo, C., Nolan, E. M., VanNieuwenhze, M. S., Duhme-Klair, A.-K., GIEDROC, D. P. (2020) The pneumococcal iron uptake protein A (PiuA) specifically recognizes tetradentate  $\text{Fe}^{\text{III}}$  bis- and mono-Catechol complexes. *J. Mol. Biol*, in the press ((doi: 10.1016/j.jmb.2020.08.005).
- 182) Antelo, G. T., Vila, A. J., GIEDROC, D. P., and Capdevila, D. A. (2020) Molecular evolution of transition metal bioavailability at the host-pathogen interface. *Trends Microbiol*, accepted for publication (TIMI-D-20-00132R1).
- 183) Capdevila, D. A., Walsh, B. J. C., Zhang, Y., Dietrich, C., Gonzalez-Gutierrez, G., and GIEDROC, D. P. (2020) Structural determinants of persulfide-sensing specificity in a dithiol-based transcriptional regulator. *Biorxiv*, available online (doi: 10.1101/2020.03.22.001966). (*preprint*)

**OTHER REVIEWS, BOOK CHAPTERS AND PUBLISHED PROCEEDINGS (16):**



- 1) Villafranca, J.J., Colombo, G., Rajashekhar, B., GIEDROC, D., & Baldoni, J. (1982) Dopamine  $\beta$ -Hydroxylase: Studies of the  $\text{Cu}^{2+}$  Environment and Development of Suicide Inhibitors. In *Oxygenases and Oxygen Metabolism*, Academic Press, Inc., pp. 125-135.
- 2) GIEDROC, D.P., Keating, K.M., Martin, C.T., Williams, K.R., and Coleman, J.E. (1986) Zinc Metalloproteins Involved in Replication and Transcription. *J. Inorg. Biochem.* **28**, 155-169.
- 3) Keating, K.M., GIEDROC, D.P., Harris, L.D., Ghosaini, L.R., Williams, K.R., Sturtevant, J.M., & Coleman, J.E. (1987) The Contribution of Zinc to the Nucleic Acid Binding Properties of the Bacteriophage Gene 32 Protein. In *Protein Structure, Folding, and Design 2*, Alan R. Liss, Inc., New York, Vol. 67, pp. 35-44.
- 4) GIEDROC, D.P., & Coleman, J.E. (1988) Zinc Domains in Nonspecific Nucleic Acid Binding Proteins. *UCLA Symp. Mol. Cell. Biol., New Series* (Winge, D. & Hamer, D., eds.), Alan R. Liss, Inc., New York, Vol. 98, pp. 239-248.
- 5) Coleman, J.E., & GIEDROC, D.P. (1989) Zinc Proteins in Nucleic Acid Replication. In *Metal Ions in Biological Systems* (Sigel, H., ed.), Marcel Dekker, New York, Vol. 25, pp. 171-234.
- 6) GIEDROC, D.P. (1994) Zinc: DNA Binding Proteins. In the *Encyclopedia of Inorganic Chemistry* (King, R.B., ed.), John Wiley & Sons, Ltd., Sussex, England, pp. 4392-4406.
- 7) Pennella, M. A., Eicken, C., Busenlehner, L. S., Chen, X., VanZile, M. L., Sacchettini, J. C., and GIEDROC, D. P. (2003) Coordination Chemistry and Allosteric Switching in Bacterial Metal Sensor Proteins. In *Biomolecular Chemistry: A Bridge to the Future* (Baba, Y., ed.), Maruzen Co., Ltd., Tokyo, pp. 160-165.
- 8) Pennella, M. A. & GIEDROC, D.P. (2005) Zinc: DNA Binding Proteins. In the *Encyclopedia of Inorganic Chemistry*, 2<sup>nd</sup> Ed. (King, R.B., ed.), John Wiley & Sons, Ltd., Sussex, England. Vol. IX, pp. 5867-5885.
- 9) GIEDROC, D. P., and Grosseohme, N. E. (2009) Metal Ions and the Thermodynamics of RNA Folding, in *Metal Ion Interactions with Nucleic Acids* (Hud, N., ed.), Royal Society of Chemistry (RSC) Publishing, Cambridge, UK, pp. 180-220. (*Invited monograph*).
- 10) Miller, W. A. & GIEDROC, D. P. (2010) Ribosomal Frameshifting in Decoding Plant Viral RNAs, in *Recoding: Expansion in Decoding Rules Enriches Gene Expression* (Atkins, J. E., & Gesteland, R. F., eds.). *Nucleic Acids and Molecular Biology* 24, Springer, NY, pp. 192-220 (*Invited monograph*).
- 11) Grosseohme, N. E., & GIEDROC, D. P. (2012) Allosteric Coupling Between Transition Metal Binding Sites in Homooligomeric Metal Sensor Proteins. *Methods in Molecular Biology* (Fenton, A., ed.), Vol. 796, pp. 31-51. Springer-Verlag (Humana Press), Totowa, NJ (*Invited monograph*).
- 12) Grosseohme, N. E., & GIEDROC, D. P. (2012) Illuminating Allostery in Metal Sensing

Transcriptional Regulators. *Methods in Molecular Biology* series (Bujalowski, W., ed.), Vol. 875, pp. 165-192. (doi: 10.1007/978-1-61779-806-1\_8), Springer-Verlag (Humana Press), Totowa, NJ (*Invited monograph*).

13) Guerra, A. J., and GIEDROC, D. P. (2013) 3.05 Metal-Regulated Gene Expression in *Comprehensive Inorganic Chemistry II* (Pecoraro, V. P., ed.), Elsevier, Ltd., Oxford, UK (doi: 10.1016/B978-0-08-097774-4.00305-3) (*Invited monograph*)

14) Higgins, K. A., and GIEDROC, D. P. (2013) *Metal Specificity of Metallosensors in Metals in Cells* (Scott, R. A, Culotta, V., eds.), pp. 209-224, John Wiley & Sons, Ltd., West Sussex, UK. (*Invited monograph*)

15) Wang, J., Capdevila, D. A., and GIEDROC, D. P. (2020) 80005. *Metal Ion Homeostasis in Comprehensive Coordination Chemistry III* (Li, Y., Que, L. eds.), *in the press*, Elsevier, Ltd., Oxford, UK (*Invited monograph*). (doi: 10.1016/B978-0-12-409547-2.14675-X).

16) Walsh, B. J. C., Brito, J. A., and GIEDROC, D. P. (2020) 40018, *Hydrogen sulfide signaling and enzymology in Comprehensive Natural Products III: Chemistry and Biology, Vol 4*, pp. 430–473 (Liu, H.-W., Begley, T., eds.), *accepted for publication*, Elsevier, Ltd., Oxford, UK (*Invited monograph*) (doi: 10.1016/B978-0-12-409547-2.14699-2)

#### **MANUSCRIPTS SUBMITTED FOR PUBLICATION (0) OR IN PREPARATION (1):**

1) Fakhoury, J., Edwards, K. A., Gonzalez-Gutierrez, G., Shen, Y., Zhang, Y., Capdevila, D. A., and GIEDROC, D. P. Structure and thiol reactivity profiling of the Gram-positive persulfide sensor CstR. *Manuscript in preparation*.

#### **Ph.D. (26) and M.S. (10) Degree Students Supervised:**

- 1994      Huawei Qiu, Ph.D., "The Role of Zinc Coordination in T4 Gene 32 Protein"
- 1994      Hsueh-O Chang, M.S., "RNA Binding Properties of Retroviral Nucleocapsid Proteins"
- 1995      Jana Villemain, Ph.D., "The Role of the N-terminal Domain of T4 Gene 32 Protein in the Cooperatively Bound Protein-Single-stranded Nucleic Acid Complex"
- 1995      Raza Khan, Ph.D., "Nucleic Acid Binding Studies of Recombinant HIV-1 Nucleocapsid Protein"
- 1996      Juqian Guo, M.S., "Structure and Stability of Co(II)-Complexes formed by Wild-type and Metal-Ligand Substitution Mutants of T4 Gene 32 Protein"
- 1999      Yun Gao, Ph.D., "Solution Structure, Backbone Dynamics, and RNA Binding Properties of Mason-Pfizer Monkey Virus Protein"
- 2000      Carla Theimer, Ph.D., "Structure-Stability Relationships in mRNA Pseudoknots Involved in Translational Control"
- 2001      Julius L. Apuy, Ph.D., "Ratiometric Pulsed Alkylation/Mass Spectrometry: Applications in the Studies of Protein Folding and Chelate Stability in Metalloproteins"

- 2002 Paul L. Nixon, Ph.D., "Structure and Stability Contributions of Noncanonical Base Pairs in mRNA Pseudoknots"
- 2002 Michael L. VanZile, Ph.D., "Characterization of the Metal and DNA Binding Properties of Cyanobacterial SmtB, a Novel Zn(II)-Metalloregulatory Protein"
- 2002 Saritha V. Suram, M.S., "Structure-Stability Correlation of an mRNA Pseudoknot"
- 2003 Laura S. Busenlehner, Ph.D., "Metal and DNA-Binding Properties of the Cadmium Sensor *S. aureus* pI258 CadC"
- 2004 Mario A. Pennella, Ph.D., "Metal Specificity and the Mechanism of Allosteric Regulation in Metal-Sensing Metal-Responsive Transcriptional Repressors *S. aureus* CzrA and *M. tuberculosis* NmtR"
- 2005 Yun Wang, M.S., "Characterization of *M. tuberculosis* CmtR<sup>Mtb</sup>, a Pb(II)/Cd(II)-Sensing SmtB/ArsR Metalloregulatory Repressor and a Homolog from *S. coelicolor* A3(2)"
- 2005 Peter V. Cornish, Ph.D., "Solution Structure and Functional Analysis of a Frameshift-Stimulating RNA Pseudoknot from Sugarcane Yellow Leaf Virus"
- 2007 Lichun Li, Ph.D., "Insights into Subgenomic RNA Synthesis in Coronaviruses from Structural and Biophysical Studies"
- 2008 Suzanne Stammler, Ph.D., "Structural Studies of a Proposed Conformational Switch in the 3' Untranslated Region (UTR) of Mouse Hepatitis Virus (MHV)"
- 2009 Zhen Ma, Ph.D., "Physicochemical Characterization of the Bacterial Cu(I)-sensing Repressor CsoR"
- 2009 Jay Pilrose, M.S., Indiana University, "Orientation of the Mouse Hepatitis Virus (MHV) Transcription Regulatory Sequence (TRS) in the Nucleocapsid Protein RNA Binding Cleft"
- 2011 Hermes Reyes-Caballero, Ph.D., Texas A&M University, "Biochemical and spectroscopic properties of the nickel sensor *Mycobacterium tuberculosis* NmtR and the zinc sensor *Streptococcus pneumoniae* AdcR"
- 2011 Benjamin Kester, M.S., Indiana University, "Initial characterization of three bacterial copper regulators"
- 2012 Mengmeng Tang, M.S., Indiana University, "Studies of *cis*-acting RNA elements and protein-RNA interaction in SARS-CoV"
- 2012 Sarah C. Keane, Ph.D., Indiana University, "Molecular determinants of coronavirus replication and transcription"
- 2012 Alfredo J. Guerra, Ph.D., Indiana University, "Structural and functional characterization of the zinc sensor adhesin competence repressor AdcR from *Streptococcus pneumoniae*"
- 2013 Gregory C. Campanello, Ph.D., Indiana University, "Mechanisms of allosteric regulation in zinc-sensing transcriptional repressors"
- 2014 Feng-Ming James Chang, Ph.D., Indiana University, "Structural and functional characterization of *Bacillus* species Copper sensing repressor protein CsoR"
- 2015 Yue Fu, Ph.D., Indiana University, "Characterization of the mechanism of copper resistance in *Streptococcus pneumoniae*"
- 2015 Justin L. Luebke, Ph.D., Indiana University, "Characterization of the per- and polysulfide sensor CstR from *Staphylococcus aureus*"
- 2015 Kendall M. Mayer, M.S., Indiana University "Purification and preliminary characterization of key replicative accessory proteins from human coronaviruses"

- 2016 Jiangchuan Shen, Ph.D., Indiana University “Characterization of the enzymes involved in hydrogen sulfide (H<sub>2</sub>S) detoxification and H<sub>2</sub>S-reactive nitrogen species (RNS) crosstalk in bacterial pathogens”
- 2016 Aaron P. Lee, M.S., Indiana University, “Biophysical characterization of protein-protein and protein-RNA interactions important for the replication and pathogenicity of coronaviruses”
- 2016 John P. Lisher, Ph.D., Indiana University, “Probing manganese homeostasis and the oxidative stress response in *Streptococcus pneumoniae*”
- 2018 Hui Peng, Ph.D., Indiana University, “Intersection of reactive nitrogen and sulfur species and H<sub>2</sub>S signaling in *Staphylococcus aureus*”
- 2018 Britta E. Rued, Ph.D., Indiana University (joint with Prof. Malcolm Winkler), “Regulation of peptidoglycan synthesis and hydrolysis in *Streptococcus pneumoniae*”
- 2019 Jiefei Wang, Ph.D., Indiana University, “The response of *Acinetobacter baumannii* to calprotectin-induced multi-metal restriction”
- 2020 Abhinaba Ray, M.S., Indiana University, “Biochemical characterization of TetR-family repressors GbaA and TloR involved in biofilm regulation and the oxidative stress response in *Staphylococcus aureus*”

**Notable Laboratory Alumni in Academic or Independent Positions (12):**

Jana S. Villemain (1990-1995), Ph.D., Texas A&M University

Associate Professor of Chemistry (tenured), Indiana University of Pennsylvania

Carla Theimer (1995-2000), Ph.D., Texas A&M University

Assistant Professor of Chemistry, The University at Albany (SUNY) (denied tenure 2015)

Laura S. Busenlehner (1998-2003), Ph.D., Texas A&M University

Associate Professor of Chemistry (tenured), University of Alabama, Tuscaloosa (deceased)

Peter V. Cornish (2000-2005), Ph.D., Texas A&M University

Associate Professor of Biochemistry (tenured), University of Missouri

Zhen Ma (2004-2009), Ph.D., Texas A&M University

Research Investigator and Group Leader, DuPont

Dr. Chul Won Lee (2010-2011), Assistant Scientist, Indiana University

Associate Professor of Chemistry (tenured), Chonnam National University, Korea

Dr. Nick Grosseohme (2007-2010), Postdoctoral Scientist, Indiana University

Associate Professor of Chemistry (tenured), Winthrop University

Dr. Khadine A. Higgins (2012-2014), Postdoctoral Scientist, Indiana University

Associate Professor of Chemistry (tenured), Salve Regina University

Sarah C. Keane (2007-2012), Ph.D., Indiana University

Assistant Professor of Biophysics, University of Michigan

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Julia A. Martin (2014-2017), Postdoctoral Scientist, Indiana University  
Assistant Professor of Microbiology and Immunology, Idaho State University

My Tra Le (2016-2018), Postdoctoral Scientist, Indiana University  
Lecturer (equiv Asst. Prof.), Vietnam National University-University of Science, Hanoi, Vietnam

Daiana A. Capdevila (2015-2019), Pew Foundation Latin American Postdoctoral Fellow, IU  
Group Leader, Lelior Institute Foundation, Buenos Aires, Argentina

### **Undergraduate Research Students Supervised:**

#### **Texas A&M University (27):**

1989 Courtney Robertson  
1990 Keith Barnhart  
1990 Sharon Syers  
1991 Brian Bruner  
1993 Amy Middlestead  
1994 Brett Thompson  
1995 Merideth Esterline  
1995-96 Paul Nixon, Jennifer Roberts, Ponnareth Pok (HHMI Fellow); Rudy Martinez (HHMI Fellow)  
1997-98 Lindsay Windham (Undergraduate Honors Fellow; 1998 Pfizer Summer Undergraduate Research Fellow); Imelda Hau (1998 ONR Summer Intern)  
1997-01 Brian Cannon (HHMI Fellow; Undergraduate Honors Fellow)  
1998-99 Travis Young  
1998-00 Endah Sulistijo (Undergraduate Honors Fellow)  
1999-00 Ryan Loyd; Patricia Gordon (2000 ONR Summer Intern)  
2000-01 Bessie Mannankara  
2000-01 Deepa Thomas  
2003 Annie Arguello (2003 ONR Summer Intern, St. Mary's University); Imran Khan  
2003 Bryan Tackett  
2004 Kathryn Bispeck  
2004-06 Justin Chen, Joseph Kopfler  
2006-07 Michelle Gaona

#### **Indiana University (19):**

2007-09 Mary Ellen Finnegan  
2008-10 Kate Gifford  
2008-11 Katie Geiger  
2010-11 Christopher Short  
2011 Ross Brenner  
2011 Sidney Fletcher  
2011-14 Logan Norrell  
2012-13 Adriana Giuliana  
2012-13 Claïressa Brown  
2012-13 Ryan Kabir  
2013-17 Hendrik Glauninger

2013-14 Lilly Kline  
2015-16 Emily Reidy  
2014-17 Christopher Dietrich  
2017 Jonathan Ritter  
2017-18 Jamie Wann  
2018-20 Michael A. Carbonell  
2020- Abbey Landini, Chris Basile

**High School Students Supervised (4):**

1990 Katherine Chen  
1991 Jesse (YuPo) Chang  
1992 Kevin Jackson  
2018-19 Yu-Chen Huang (enrolled in Columbia University, Fall 2019)

**Current Research Group (7):**

Postdoctoral Scientists (2): Dr. Katie Edmonds; Dr. Sambuddha Sen  
Ph.D. Students (5): Brenna Walsh (C5), Yifan Zhang (B5), Joseph Fakhoury (C4), Matthew Jordan (B4), Minyong Kim (B1) (C=Chemistry Ph.D.; B=Biochemistry Ph.D., year)  
Undergraduate Students (2): Abbey Landini, Chris Basile

**TEACHING ACTIVITIES:**

**TEXAS A&M UNIVERSITY:**

**BICH 107**, Freshman survey course of biochemical research (1 guest lecture)  
Fall 1989, Fall 1990, Fall 1992, Fall 1996, Fall 1997, Fall 2006

**BICH 681** (1 credit), Student seminar course  
Fall 1989, Spring 1990, Fall 1990, Spring 1991, Fall 1994, Fall 1995

**BICH 689** (1 credit), Special Topics, Spectroscopy of Biological Macromolecules. Devoted to theory and practice of spectroscopy of proteins and nucleic acids. Covered absorption, fluorescence (steady-state and lifetime), circular dichroism, and NMR (to basic 2D NMR) spectroscopies. This material was largely incorporated into a revised BICH 624  
Spring 1990

**BICH 624** (3), Proteins, Enzymes and Nucleic Acids (*see below*)  
Spring 1991, Spring 1993, Spring 1994, Spring 1995, Spring 1996, Spring 1997

**BICH 440** (3), Comprehensive Biochemistry I, Honors section. Text, Voet & Voet's *Biochemistry*. First course of two-semester sequence in general biochemistry for honors-level (GPA 3.25 or above) juniors and seniors in Biochemistry and related majors.  
Fall 1991 (course shared with one other instructor)

**BICH 603** (3), Physical Biochemistry. Survey course for first year graduate students in Biochemistry and interested Chemistry students.

Fall 1992, 1994 (course shared with two other instructors)

**BICH 407** (1), Metals in Biological Systems. Advanced undergraduate course taught from the current literature focusing on the structure, function and mechanism of metal-regulated switches which operate at the transcriptional level of gene expression; Metal homeostasis and human disease.

Spring 1997, Spring 2006

**BICH 410** (3), Comprehensive Biochemistry I, Text, Lehninger, *Principles of Biochemistry* or Mathews & van Holde, *Biochemistry*. First course of two-semester sequence in general biochemistry for juniors and seniors.

Fall 1997, 1998

**BICH 609** (2), Development of an Original Research Proposal.

Spring 1998, 1999, 2000, 2001

**BICH 605** (3), Biochemical Methods. This course covers often-used methods of biochemical analysis, including protein purification, physical methods, recombinant DNA methodologies, and DNA arrays with an emphasis on the understanding, implementation and rationale behind the methods.

Fall 1999, 2000

**BICH 608** (2), Critical Analysis of the Biochemical Literature (shared with one other instructor)

Fall 2002, 2003

**BIPH 655** (4), Molecular Biophysics: Macromolecular Interactions. Core graduate course in the Molecular Biophysics Training Program.

Spring 2003, Spring 2004, Fall 2004, Fall 2005, Fall 2006

#### **Courses Developed:**

**BICH 624 (3) Proteins, Enzymes and Nucleic Acids.** Given that 4-5 years had elapsed since BICH 624 was offered, I completely revamped the course in Spring 1991 in order to incorporate new findings. Particular emphasis was placed on structure and stability of proteins and nucleic acids (DNA, unusual RNAs), coupled with a complete course on various spectroscopies relevant to the study of biomolecules, followed by thermodynamics of protein-nucleic acid interactions, the latter developed from fundamental binding and linkage relationships. Texts included Cantor & Schimmel's *Biophysical Chemistry* and Wyman and Gill's *Binding and Linkage*. Since no single text proved satisfactory, most of the material for class discussion was taken directly from the primary literature. Emphasis has been placed on problem solving with the use of computers to generate theoretical isotherms, etc., and implementation of nonlinear least squares fitting algorithms in data analysis. In Spring 1994 BICH 624 became a core required course for our graduate students.

**BICH 407 (1) Metals in Biological Systems.** A literature survey course designed for advanced undergraduate students. The course covered the coordination chemistry and mechanisms of gene regulatory systems which mediate the response of cells to a variety of heavy

metal stimuli. A companion text available for purchase by students was *Principles of Bioinorganic Chemistry* by S. Lippard and J. Berg.

**BIPH 655 (3) Molecular Biophysics: Macromolecular Interactions.** The objective of this course is to investigate the subject of macromolecular interactions, *i.e.*, binding, from a perspective strongly rooted in statistical thermodynamics and probabilities. The student gains an understanding of the rates and equilibria of macromolecular interactions involving proteins, nucleic acids (DNA and RNA), and biological membranes, with a special emphasis the quantitative analysis and evaluation of different binding models, rather than the details of the biochemical or spectroscopic methods commonly used to investigate binding equilibria and kinetics. Optional Texts: *Thermodynamic Theory of Site-Specific Binding Processes in Biological Macromolecules* by E. DiCera; *Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology* by Dill and Bromberg; *Kinetics for the Life Sciences* by Gutfreund.

#### **INDIANA UNIVERSITY:**

**B600/B800** (1 credit), Seminar in Biochemistry. A graduate student-led literature survey course of recent research published in high-profile journals, loosely affiliated with invited speakers of the IU Biochemistry seminar series.

Spring 2008; Fall 2008; Spring 2010; Spring 2013, Spring 2016

**B603/C685** (1.5 credits), Macromolecular Structure and Interactions. A graduate-level course that was loosely based on BIPH 655 (see above), but with a greater emphasis on statistical thermodynamics, macromolecular dynamics over a wide range of timescales, and single-molecule methods. Discontinued (now C680).

Spring 2008; Spring 2010

**B501** (4.5 credits; shared with two other instructors). First semester graduate core course in biochemistry for Biochemistry, Biology and Chemistry majors.

Fall 2008, Fall 2009

**B531/C582** (1.5 credits), Biomolecular Analysis and Interactions. A first-year graduate survey course in common biophysical methods to monitor macromolecular folding and interactions. Protein purification and characterization; absorption and fluorescence methods; calorimetry, NMR perturbation methods; SPR; microscale thermophoresis (MST); BLI; HDX-mass spectrometry; SAXS.

Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020

**C680** (1.5 credits). Introduction to Quantitative Biology and Measurement. One of two companion 1.5 cr courses developed for our NIGMS T32 Training Program in Quantitative and Chemical Biology (QCB). Modules in equilibrium binding (coupled equilibria, quantitative analysis); single molecule biophysics (FRET, force, AFM); biological mass spectrometry (fragmentation methods, proteomic and metabolomics profiling); electron microscopy (cryo-EM).

Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020

**B680/C687** (1.5 credits), Special Topics in Biomolecular NMR Spectroscopy. Advanced graduate course devoted to understanding the theory, logic and challenges of modern NMR



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spectroscopy of proteins, protein assemblies and large RNAs.  
Spring 2009, Spring 2015, Spring 2018

**C689** (1 credit), Journal Club in Quantitative and Chemical Biology (QCB). Graduate seminar course associated the NIH-funded training program in QCB.  
Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2018, Fall 2019

**B508 (B680/C687)** (1.5 credits), Biological Regulation. Core graduate course in the Chemical and Physical Biology track of the Biochemistry Ph.D. program that covers regulatory mechanisms and cellular logic of metabolic, transcriptional, post-transcriptional and post-translational regulation. This course is taught from the primary literature.  
Spring 2019, Spring 2020, Spring 2021 (*new course*)

## **SERVICE AND ADMINISTRATION:**

### **Intramural:**

#### **TEXAS A&M UNIVERSITY:**

1989 to 1995	Member, Graduate Program Committee (GPC)
1990 to 1991	Member, Junior Faculty Search Committee
1991 to 1992	Chair, Oligonucleotide Synthesis Advisory Committee (OSAC)
1992 to 1993	Member, X-Ray Crystallographer Welch Chair Search Committee
1992 to 1999	Member, Advanced DNA Technology Laboratory Faculty Advisory Committee
1994 to 1995	Member, X-Ray Crystallographer Welch Chair Search Committee
1994 to 1995	Member, Computer Use Committee
1994 to 1995	Member, Junior Faculty Search Committee
1995 to 1998	Secretary, TAMU Section of the American Chemical Society
1995 to 1998	Chair, Computer Use Committee
1996 to 1998	Member, Executive Committee of the Department
1997 to 1999	Chair, Facilities Committee
1997 to 1998	Chair, Junior Faculty Search Committee (resulted in 3 hires made)
1998 to 2007	Member, Graduate Recruiting and Admissions Committee
1999 to 2007	Faculty Director, Laboratory for Biomolecular NMR Spectroscopy
1999 to 2007	Founding co-Director, Center for Advanced Biomolecular Research
1999 to 2000	Member, Head of Department Search Committee
1999 to 2001	Member, College of Agriculture and Life Sciences Promotion and Tenure Committee
2000 to 2006	Member, Departmental Promotion and Tenure Committee (Chair, 2002-2005)
2001 to 2003	Member, TAMUS Life Sciences Task Force
2002 to 2007	Member, Executive Committee, NIH Molecular Biophysics Training Program; Director-elect (January 2005)
2002 to 2004	Member, Departmental Executive Committee
2003 to 2006	Member or Chair, Structural Biology Faculty Search Committee

**INDIANA UNIVERSITY:**

2007 to 2008	Member, Faculty Search Committee, Biological Chemistry (Department of Chemistry)
2007 to 2008	Member, Junior Faculty Search Committee, Virology (Department of Biology)
2007 to 2008	Member, Senior Faculty Search Committee, Cancer Biology
2007 to 2008	Member, Director Search Committee, Indiana Cultivation and Bioprocessing Facility
2007 to 2008	Member, Graduate Admissions Committee (biological division), Department of Chemistry
2007 to 2008	Member, Faculty Information Gathering Committee, Professors Tolbert and Zhang
2008 to 2011	Member, Policy Committee, Department of Chemistry
2008 to 2009	Member, Faculty Search Committee, Program in Biochemistry
2010 to present	Organizing Director, Graduate Training Program in Quantitative and Chemical Biology (QCB)
2010 to 2015	Chair, Department of Chemistry
2014	Member, Vice Provost for Research Search Committee
2014 to 2015	Member, Chemical Biology/Bioorganic Chemistry Faculty Search Committee
2015	Member, Vice President for Research Search Committee
2015 to 2016	Chair, Chemical Biology Faculty Search Committee
2016 to 2019	Member, Steering Committee and Co-Director, Chemical Biology Cluster, Precision Health Initiative, IU School of Medicine/Indiana University Bloomington
2016 to 2019	Member, Executive Search Committee, Precision Health Initiative, IUSM/IUB
2016 to 2017	Member, External Review Committee, Department of Chemistry
2016 to 2017	Chair, Bioanalytical Chemistry Faculty Search Committee
2016 to 2017	Member, Membrane Structural Biology Search Committee (MCB)
2016 to 2017	Chair, College of Arts and Sciences Strategic Planning Committee on Research, Creative Activity and Graduate Education (rCAGE)
2017 to 2018	Chair, Bioanalytical Chemistry Faculty Search Committee
2018 to 2019	Co-chair, Computational Biology Search Committee (joint with the School of Informatics, Computing and Engineering, SICE)

**Extramural:**

1995	Member, <i>Ad hoc</i> Site-Visit Review Committee, SAIC Laboratory of Cell and Molecular Structure and SAIC AIDS Vaccine Development Program, Frederick Cancer Research and Development Center, NCI, Frederick, MD
1999	<i>Ad hoc</i> full member, Molecular and Cellular Biophysics (BBCA) Study Section, NIH
2000	<i>Ad hoc</i> reviewer, Division of Chemistry, National Science Foundation
2001 to 2006	Full member, Cancer Drug Development Peer Review Committee, American Cancer Society (met twice per year)
2001	<i>Ad hoc</i> Full Member, Special Emphasis Panel SSS-B SS, NIH

2001	<i>Ad hoc</i> Full Member, SSS-A(1) SS, NIH
2002	<i>Ad hoc</i> Full Member, ZRG1 BBCB SS, NIH
2003	<i>Ad hoc</i> Full Member, ZRG1 SSS-B SS, NIH
2003	<i>Ad hoc</i> Full Member, BBCA SS, NIH
2004	Member, Program Committee, 2005 Biophysical Society Annual Meeting
2004	<i>Ad hoc</i> Full Member, ZRG1 SS, NIH
2004	<i>Ad hoc</i> Full Member, BMT SS, NIH
2005	Mail reviewer, ZRG1 BCMB-Q SS, NIH
2006 to 2010	Full Member, BRT-B (Biomedical Research Training) SS, NIH
2011	Full reviewer, Program Project Grant, NIH
2012	Site Visit Review Panel, Cork, Ireland, on behalf of the National Science Foundation of Ireland
2012	Panel Reviewer, Division of Chemistry, NSF
2013	Member, External Departmental Review Committee, Department of Biochemistry, Wayne State University School of Medicine
2013 to 2015	Panel Reviewer, National Science Foundation, Engineering Research Center (ERC) Program
2013	Panel Reviewer, National Science Foundation of Ireland
2013	Panel Reviewer, BBSRC
2014	Panel (IAM) Reviewer, ZRG1 BCMB-P SS, NIH
2014	Member, Editor-at-Large Search Committee, <i>ACS Infectious Diseases</i> (launched 1/2015)
2017	<i>Ad hoc</i> Full Member, SCORE SS, NIGMS
2018	Panel (IAM) Reviewer, ZRG1 F04B-T Fellowship Applications, NIH
2018	Co-Chair, 11 <sup>th</sup> International Copper Meeting, Sorrento, Italy
2019	Member, Scientific Advisory Board, Q-Life Institute, Institut Curie, Paris
2019	Member, International Advisory Board, E3B: Metals in Biology Network, Durham, UK

### **JOURNAL EDITORIAL AND REVIEWING ACTIVITIES:**

1997 to 2001	Member, Editorial Board, <i>Journal of Biological Chemistry</i>
2013 to 2016	Member, Advisory Board, <i>Metallomics</i> (an RSC journal)
2016 to 2020	Chair, Editorial Board, <i>Metallomics</i>
2021 to 2022	Editor-in-Chief, <i>Metallomics</i> (Oxford University Press)

Regular reviewer for *Proceedings of the National Academy of Sciences USA*, *Biochemistry*, *Journal of Molecular Biology*, *Journal of the American Chemical Society*, *Journal of Biological Chemistry*  
*Ad hoc* reviewer for *Biophysical Journal*, *Nucleic Acids Research*, *Journal of Inorganic Biochemistry*, *Journal of Biological Inorganic Chemistry*, *Chemical Communications*, *Molecular Microbiology*, *RNA*, *Nature Reviews Microbiology*, *Nature Chemical Biology*, *Nature Structural and Molecular Biology*, *Science*, *Chemical Science*