

Curriculum Vitae
THOMAS VINCENT O'HALLORAN

PERSONAL

Department of Microbiology and Molecular Genetics
and Department of Chemistry
Michigan State University
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EDUCATION

NIH Postdoctoral Fellow, MIT, Cambridge, Massachusetts – Biological Chemistry
Advisor: Christopher T. Walsh (1986)
Ph.D., Columbia University, New York, New York - Bioinorganic Chemistry
Advisor: Stephen J. Lippard (1985)
B.S., M.A., University of Missouri, Columbia, Missouri - Chemistry
Advisor: John M. Malin (1980)

PROFESSIONAL POSITIONS

Michigan State University

MICHIGAN STATE UNIVERSITY FOUNDATION PROFESSOR, Department of
Microbiology and Molecular Genetics and Department of Chemistry (2021-present)

FOUNDING DIRECTOR, Elemental Health Institute (2021-present)

PRINCIPAL INVESTIGATOR, Quantitative Element Imaging for the Life Sciences, NIGMS
Biotechnology Research Resource P41 Center (*moving from NU to MSU in June 2021- 2025*)

Northwestern University

FOUNDING DIRECTOR, Chemistry of Life Processes Institute (2004 - 2020)

DIRECTOR, Center for Developmental Therapeutics (2011 - 2020)

DIRECTOR, Quantitative Bioelement Imaging Center (2005- 2020)

DIRECTOR, National Cancer Institute /Chicago Region Physical Science Oncology Center
(2011- present)

ASSOCIATE DIRECTOR, Basic Science Research, Robert H. Lurie Comprehensive Cancer
Center (2007 - 2014)

CHARLES E. AND EMMA H. MORRISON PROFESSOR, Department of Chemistry and
Department of Molecular Biosciences (2001 - 2020)

DOW PROFESSOR, Northwestern University (1996 - 1998)

PROFESSOR, Departments of Chemistry and Molecular Biosciences (1994-present)
Feinberg School of Medicine, Department of Medicine, Division of Hematology/Oncology
(2017-present)

ASSOCIATE PROFESSOR, Departments of Chemistry and Molecular Biosciences (1991 - 1994)

ASSISTANT PROFESSOR, Departments of Chemistry and Molecular Biosciences (1986 - 1991)

RESEARCH INTERESTS

Professor O'Halloran's research spans the areas of chemistry, biology, medicine and biotechnology. He and his collaborators have discovered new types of signaling pathways and receptors that regulate growth, proliferation or entry into the meiotic cell cycle. His research focuses on understanding how receptors for metals such as copper, iron and zinc, regulate cellular functions across organisms that span the tree of life. He introduced the idea that intracellular fluctuations in transition metal availability control key cellular decisions, and the concept of the cellular metallome and discovered new classes of proteins that manage the cellular metal ion economies. Using genetic, chemical, structural and mechanistic approaches, he and his collaborators have discovered new types of metal-binding proteins, defined their structures, functions and mechanisms and tied their function to a number of disease-related physiological processes. The earliest examples of these were soluble receptors regulate gene expression, namely the *metalloregulatory* proteins. His team also discovered and characterized a second class of metal receptors, known as *metallochaperone* proteins: these factors govern metal flow throughout eukaryotic and prokaryotic cell physiology. On the small molecule side, O'Halloran discovered new compositions of matter and established mechanisms in the molybdenum, arsenic and platinum families of anticancer drugs. Most recently he and his collaborators discovered that zinc fluxes control fundamental developmental decisions in bacteria, disease-causing parasites and fertilization of mammalian eggs. Over five hundred press pieces have been published about the zinc fluxes and sparks that accompany fertilization of mammalian eggs. *Discover Magazine* listed the paper on the zinc spark in human eggs as one of the top 100 scientific discoveries of 2016. Professor O'Halloran gave the Annual Dewitt Stetten Jr. Lecture at NIH in September 2016. Recipients of this award are leaders in biomedical research who have received long-time NIGMS funding and include several Nobel Prize winners. The following link was produced by the NIH and provides an overview of O'Halloran's research.

<https://biobeat.nigms.nih.gov/2017/01/interview-with-a-scientist-thomas-ohalloran-metal-maestro/>

Prof. O'Halloran is deeply committed to broader education of the public as a critical obligation of federal research funding.

AWARDS

- Fred Basolo Medal for Outstanding Research in Inorganic Chemistry Northwestern University and Chicago Section, American Chemical Society (2021)
- National Academy of Inventors (elected 2020)
- The Annual Dewitt Stetten Jr. Lecture, National Institute of Health (2016)
- Royal Society of Chemistry Dalton Award for Bioinorganic Chemistry (2013)
- Fellow, Royal Society of Chemistry (2013)
- David E. Danks Award for Research on Copper Homeostasis and its Disorders (2008)
- Fellow, Japanese Society for Promotion of Science (2007)
- MERIT Award, National Institutes of Health (2001-2010)
- Fellow, American Association for the Advancement of Science (1999)
- Guggenheim Fellow, John Simon Guggenheim Memorial Foundation (1998-1999)
- Leroy Hall Award for Excellence in Teaching (1998)
- Interfraternity Council and Panhellenic Association Award for Excellence in Teaching (1997)

- Scientific Achievement Award, American Society for Biochemistry and Molecular Biology; Sponsored by Schering-Plough, (1996)
- Faculty Honor Roll, Associated Student Government, NU (1996)
- The Camille and Henry Dreyfus Foundation Teacher-Scholar Award (1993-95)
- Mortar Board - Faculty Honor Roll of Outstanding Teachers (1994)
- Alfred P. Sloan Research Fellow (1991-1993)
- Eli Lilly Biochemistry Award (1989-1991)
- National Searle Scholars Award, The Chicago Community Trust (1987-90)
- Presidential Young Investigator Award, National Science Foundation (1987-92)
- Camille and Henry Dreyfus Foundation Distinguished New Faculty Award (1986)
- Du Pont Young Faculty Award, Northwestern University (1986-87)
- National Research Service Award Postdoctoral Fellowship-NIH (1985-86)
- Pegram Award, Columbia University, Ph.D. program (1984)
- Society of the Sigma Xi; full member (1980)

PROFESSIONAL ACTIVITIES

- * Preclinical Drug Development Venture (PDDV) and Preclinical Development Committee, City of Hope, Duarte, CA (2019-present)
- * Harper Cancer Research Institute, University of Notre Dame, External Advisory Board (2014 – present)
- * Strategic Portfolio Optimization Committee, City of Hope, CA External Board Member (2014- present)
- * Foreign Advisor, Institute for Molecular Science, Okazaki, Japan (2013-2015)
- * National Searle Scholars Program Advisory Board, Kinship Trust (2010-2013)
- * TEDx NorthwesternU Presentation “Zinc Sparks in Control of Reproduction” (2012), <http://tedx.northwestern.edu/webcast>
- * Chair, Executive Committee, Physical Sciences in Oncology, National Cancer Institute, National Institutes of Health (2010-2011)
- * Member, Executive Committee, NCI Alliance for Nanotechnology in Cancer, National Cancer Institute, National Institutes of Health (2010-2011)
- * Director, Chemistry of Life Processes Institute (2004-present)
- * Evanston Hospital Radiation Medicine Institute: Director of Research (1996-2002)
- * Chicago Biomedical Consortium Advisory Committee (2004-present)
- * Centre for Blood Research, Scientific Advisory Board (2003-present).
- * Advisory Panel Member, US DOE Biological Sciences Directorate (2001-2002)
- * Member, Gordon Research Conferences Council (2005-2008)
- * Superfund Research Program External Advisory Committee, NYU Med School (2001-5)
- * Chair, General Faculty Committee (GFC) of NU (2000-2001)
- * Chairman, NIH Metallobiochemistry Study Section, 1998-2000; Member 1996-1998
- * Advisory Board, Center for Environ. Bioinorganic Chemistry, Princeton Univ. (2000)
- * Robert Lurie Cancer Center Northwestern University
Leadership Roles in Basic Sciences Programs & Executive Committee (1989-2014)
- * Member, American Chemical Society:
Division of Inorganic Chemistry & Division of Biological Chemistry
Chairman, Division of Bioinorganic Chemistry (1997-1998)
- * Past/current member of American Society for Biochemistry & Molecular Biology;

Endocrine Society, Society for Biological Inorganic Chemistry; Protein Society

LEADERSHIP AND ADMINISTRATIVE EXPERIENCE

Founding Director of The Chemistry of Life Processes Institute (2004-2020) As Director of The Chemistry of Life Processes Institute (CLP), Professor O'Halloran was responsible for the overall scientific leadership, strategic planning, financial oversight and day-to-day management of this interdisciplinary Institute. He worked with the Deans of three of Northwestern University's colleges, the Vice President for Research, the Directors of four Centers and the chairs of eight departments to recruit faculty, govern space assignments and allocate resources in the Institute's 130,000 NSF building Silverman Hall. His key responsibility was organizing and leading teams of interdisciplinary biomedical researchers at the interface of chemistry, biology, physics, engineering, medicine, proteomics, biotechnology, molecular therapeutics and biological nanoscale and molecular imaging. The major accomplishments of the Institute, to date, include formation of over a dozen team-based, multidisciplinary biomedical research teams that have received extensive peer review funding. Another central accomplishment is the development of an award-winning administrative umbrella structure that supports formation, coordination and/or support of four university-wide Centers and eight core facilities (<http://clp.northwestern.edu>). Over twenty companies have been seeded within the Institute and are developing the tools created within CLP for clinical use. Under O'Halloran's leadership, the Institute has evolved a broad ecosystem for interdisciplinary training in the life sciences that fosters the next wave of biomedical innovation. Some milestones of the Institute's success are listed below. He has recruited a philanthropic advisory group (the Executive Advisory Board) and led a collaborative effort with Northwestern's Office of Alumni Relations and Development to raise over \$10 M in philanthropy to support the CLP Mission.

Catalyzing Team Science Breakthroughs. The Institute has directly generated over \$63M in new external grant funds for interdisciplinary biomedical research since 2009. With a current annual operating budget of \$10M the Institute has developed groundbreaking programs in education, training, and outreach across disciplines. CLP's shared instrumentation and expertise have facilitated and enabled Northwestern faculty across the two campuses to generate this new external research funding. Four CLP core facilities contributed to the competitive renewals of the Robert H. Lurie Comprehensive Cancer Center CCSG grant from the NCI. The CLP faculty roster now includes over 60 leaders in synthetic and natural products chemistry, proteomics, bioinorganic chemistry, cancer research, molecular biology, and engineering. Professor O'Halloran also led the Institute's pursuit of an NCI-funded center for research at the interface of physical sciences and oncology and he has served as the PI for this Physical Science Oncology Center (PSOC) since 2011. Supported by \$22M in funding over 10 years, this team is producing breakthroughs in our fundamental understanding of the impact of physical forces on chromatin organization and gene expression.

Stimulating new levels of interdisciplinary education. An important role of the Institute is to foster interdisciplinary research across the training continuum from undergraduates, to graduate students, postdoctoral fellows, staff and faculty. The Institute has brought in philanthropy or federal grants to these ends by building a dual mentor system where in each trainee has advisors from complementary disciplines. The success of this interdisciplinary training environment was recognized by the award of a new NIH training grant in the NIGMS Chemistry Biology Interface Program (2013), led by Drs. Silverman and Kelleher and a subsequent competitive renewal of this training grant. The program took an early lead in bringing new curriculum focused on rigor and reproducibility of scientific research and pioneered entrepreneurship training for its students.

Designing and programing a new building to support silo-breaking research teamwork. O'Halloran served as Chair of the Institute Planning Committee (2001-2006) and the Building Program

Committee for Silverman Hall (see Proteomics and Nanobiotechnology Building) (2003-2009). The building, which serves as the home of the Chemistry of Life Processes Institute, opened in 2009 and was awarded the LEEDS Gold designation. It is now known as The Richard and Barbara Silverman Hall for Therapeutics and Molecular Diagnostics, in honor of the lead donor. Professor O'Halloran leads the CLP Faculty Executive Committee (2005-present) and convened an External Advisory Board (EAB) (2009-present), which is composed of alumni, donors and leaders of the biotech and pharma communities. The EAB has helped to raise philanthropic gifts, which support Institute operations, fellowships, program development and the administration of affiliated centers and core facilities. The Institute has been instrumental in the recruitment of several senior thought-leaders in the field of molecular imaging; bringing Tom Meade from Caltech and, in the field of proteomics, Neil Kelleher from the University of Illinois, Urbana.

Twelve centers and facilities that provide cutting edge technology to interdisciplinary teams. Under O'Halloran's leadership the Institute has supported the development of twelve Cores and Centers that provide investigators with a broad range of tools, such as cheminformatics, PDX tumor models, high-throughput screening, preclinical testing and in vivo imaging, along with PhD level expertise to support translation of their innovations into society.

Director, Northwestern University Center for Developmental Therapeutics (2011- 2020) Professor O'Halloran co-founded this center with Dr. Andrew Mazar with the mission of accelerating the progress of discoveries in the basic sciences into new clinical applications. One central activity was guiding faculty as they brought new agents from their labs into a pre-clinical drug development pipeline. Dr. Mazar served as the Managing Director of CDT and also served as the Entrepreneur in Residence (EIR) in this center through August, 2016 and now serves as a consultant to the center. He is now spinning out new CLP companies and services into the private sector. The Center gained a new EIR in Bill Sargent, a long-time pharma leader, who joined CLP in 2017. CDT partners with Robert H. Lurie Comprehensive Cancer Center (RHLCCC) on cancer drug development. This mission has since expanded to serve the clinical and basic sciences researchers across the NU and Chicago biomedical community. CDT now curates the Northwestern University therapeutic pipeline, an extensive Patient Derived Xenograft tumor collection and supports drug discovery activities in range of disease targets. Since its founding, CDT and other CLP-affiliated Centers (Northwestern Proteomics and the Center for Molecular Innovation and Drug Discovery), have facilitated the formation of numerous companies, including: Psychon, Nerites, Opticent, PreDx, Remedyon, Valence Therapeutics, Modulytics, Vascular Solutions, Inc., Zephyrus, Third Coast Pharmaceuticals, Lung Therapeutics Inc, Viamet, Tactic Pharma, Pamdeca, MicroMGx, Cytostrata, Preora, Healthcare, Integrated Protein Technologies, Actuate, Onyx, and Monopar. CDT has contributed to the commercialization of several new drug candidates including Decuprate, HU-ATN-658; 8-Cl-adenosine, ⁹⁹Tc-duramycin among others.

Director, Northwestern University Quantitative Bio-element Imaging Center, QBIC (2005- 2020) Dr. O'Halloran started the Quantitative Bio-element Imaging Center (QBIC) as a facility that develops cutting edge ultratrace analytical methods and makes them available to the research community as a recharge facility. Since its founding as a core facility, it has grown into a national Biotechnology Research Resource Center funded by the NIH. The QBIC team stimulates interdisciplinary research at the interface of cell biology, materials science, tissue engineering, germ cell biology and pathophysiology of disease. QBIC instruments, housed within the Chemistry of Life Processes Institute in Silverman Hall, includes ICP-OES (Thermo), ICP-MS (Thermo iCap), High Resolution ICP-MS (Thermo Element II) instruments for trace substance analysis. The latter are supported by microwave sample digestors as well as a number of sample introduction interfaces (liquid chromatography, laser ablation microscopy etc.) that serve as front ends for these ultrasensitive instruments. He is the recipient of multiple NIH S10 grant awards to

enable the acquisition of new instruments that drive QBIC to the leading edge of metallomics. The most recent S10 grant was an award for \$658k for the purchase of an ICP-TOF-MS (Thermo-Tofwerk) equipped with a laser ablation microscope (ESI). Delivery of these instruments was in December, 2020. Dr. O'Halloran, in collaboration with Chris Jacobsen (Physics and ANL), has developed a new NIH national Biotechnology Research Resource center entitled "Resource for Quantitative Elemental Mapping for the Life Sciences." This center is funded by \$8M P41 grant from NIH which was awarded in July 2020. It serves as a national resource for analysis and localization of metals in in all branches of biomedical research.

Associate Director, Basic Sciences Research Division–Lurie Cancer Center (2007-2014) O'Halloran has served in leadership positions in the Robert H. Lurie Comprehensive Cancer Center since 1990; including Program Leader for the Cancer and Physical Sciences Program (formerly, the Cancer Genes and Molecular Targeting Program). He served as Associate Director of the Basic Sciences Research Division for seven years and was responsible for development and coordination of the Center's four Basic Science Research Programs, as well as for fostering interdisciplinary collaborations and inter-programmatic interactions. He currently serves as Senior Advisor to the Director, Robert H. Lurie Comprehensive Cancer Center, and continues to advise the Cancer Center's leadership on setting strategic direction, policy and priorities for the Center.

ACADEMIC PLACEMENT OF SOME TRAINEES

(Selected from over 120 pre- and post-doctoral associates)

• Michael Natan	1991	Professor	Chemistry, Pennsylvania State Univ.
• Joan Broderick	1992	Professor	Chemistry, Montana State Univ.
• Fred MacDonnell	1992	Professor	Chemistry, Univ. of Texas-Arlington
• Stephen Watton	1992	Professor	Central Connecticut State Univ.
• Aseem Ansari	1994	Professor	Biochemistry, Univ. of Wisconsin
• Jay Bradner, MD	1994	Professor	Harvard Medical School & Broad Inst.
• Ellen Althaus	1995	Director, Grad Diversity	Chemistry, Univ. of Illinois, Urbana
• Nathanael Fackler	1997	Professor	Chemistry, Nebraska Wesleyan Univ.
• George Munson	1997	Associate Professor	Microbiology, Univ. of Miami
• Robert Pufahl	1999	Res. Professor	Heme-Onc, Medicine Washington Univ.
• Christoph Fahrni	1999	Professor	Chemistry, Georgia Tech
• David Huffman	2001	Professor	Chemistry, Western Michigan Univ.
• Caryn Outten	2001	Professor	Chemistry, Univ. of South Carolina
• F. Wayne Outten	2001	Professor	Chemistry, Univ. of South Carolina
• Yutaka Hitomi	2001	Associate Professor	Chemistry, Doshisha Univ. Kyoto Japan
• Masayasu Taki	2004	Associate Professor	Chemistry, Nagoya Univ. Japan
• Yoshiaki Furukawa	2005	Associate Professor	Chemistry, Keio Univ. Japan
• Sang-Min Lee	2010	Assistant Professor	Chemistry, Catholic Univ. of Korea
• Rich Ahn, MD/PhD	2011	Radiology Resident	UTSW Medical Center
• Emily Que	2014	Associate Professor	Chemistry, Univ. of Texas, Austin

ENTREPRENURIAL ACTIVITIES

- Advisor, **Actuate Therapeutics** (2015 – present)
- Co-Founder, **Valence Therapeutics, LLC** (2009-2014)
- Co-Founder, **Tactic Pharma, LLC** Director (2011-present)

Drug Candidate: Our four person team at Tactic developed the small molecule choline tetrathiomolybdate agent (ATN-224, aka Decuprate™) for treatment of copper overload in Wilson disease. ATN-224 was sold to **Wilson Therapeutics, Inc**, renamed *WD101* then *ALXN1840* upon acquisition by **Alexion** for \$855M. Alexion was acquired by **Astrazeneca** which continues the development of this oral drug. Our agent is now in Phase 3 Clinical Trials and has met the primary endpoint with a statistically significant improvement in daily mean copper mobilisation from tissues, demonstrating superiority compared with standard-of-care (SoC) treatments.

Drug Candidate: Mab ATN-658. Tactic Pharma further developed and licensed a humanized Mab (ATN-658) into **MonoPar Therapeutics** (2015 – present) which went public in fourth quarter 2019. MNPR is now listed on the NASDAQ and its price increase (from \$8 to \$26) was the highest first day rise for a NASDAQ stock since 2005.

- Co-Founder, **Viamet Pharmaceuticals, Inc** (2005-2012)
Viamet Pharmaceutical Holdings, LLC (2012-present)
 Chair of Scientific Advisory Board (2006-2008)
 Consultant (2006-2018)

Viamet Metallophile technology and specific assets were licenced or sold through a spin out of Viamet Pharmaceutical Holdings (**Selentiy Pharmaceuticals, LLC**) or to the following companies:

- Mycovia Pharmaceuticals, Inc.** (2018 – present)
Drug Candidate: VT-1161 antifungal agent (oteseconazole). Approved by FDA as first in class treatment for for treatment of Recurrent Vulvar Vaginosis Candidiasis (RVVC) in April, 2022 and is now marketed as **Vivjoa™**.
Drug Candidate: VT-1129 (Phase 1 trial: treatment of cryptococcal meningitis)
Drug Candidate: VT-1598 (in preclinical development for invasive mold, yeast and neglected infectious diseases)
- PhaseBio Pharmaceuticals, Inc.** (2020) VT-6440 and other selective aldosterone synthase inhibitors were acquired by PhaseBio which is continuing their development for the treatment-resistant hypertension.
- Innocrin Pharmaceuticals, Inc.** (spinout from Viamet), 2014-present
Drug Candidate: VT-468 (Phase 2: castration-resistant prostate cancer)
Drug Candidate: VT-468 (Phase 2 trials: ER-positive breast cancer)

O'HALLORAN PATENTS*US Patents Pending:*

	Serial No.	File Date	Title	Inventors	Status
1.	17/033,029	9/25/20	Zinc-Responsive Fluorophores	Garwin, Que, O'Halloran, Woodruff	Pending
2.	16/512,836	7/16/19	Compositions and Methods for the Detection of Zinc	Bernhardt, Kim, Kong, O'Halloran, Que, Woodruff	Pending
3.	14/246,678	4/7/14	Nanoparticle Arsenic-Platinum Compositions	Chen, Mazar, O'Halloran	Appeal Pending

US Patents Issued:

	Patent No.	Issue Date	Title	Inventors
1.	11,125,741	9/21/21	Compositions and Methods for the Detection of Zinc	O'Halloran, Que, Woodruff
2.	10,352,925	7/16/19	Compositions and Methods for the Detection of Zinc	Miranda Lee Bernhardt, Alison Kim, Betty Kong, Thomas O'Halloran, Emily Que, Teresa Woodruff
3.	10,118,938	11/6/18	Arsenoplatin Anti-Cancer Agents	Denana Miodragovic, Thomas O'Halloran
4.	9,897,595	2/20/18	Compositions and Methods for the Detection of Zinc	Thomas O'Halloran, Emily Que, Teresa Woodruff
5.	9,725,475	8/8/17	Arsenoplatin Anti-Cancer Agents	Denana Miodragovic, Thomas O'Halloran
6.	9,499,574	11/22/16	Arsenoplatin Anti-Cancer Agents	Denana Miodragovic, Thomas O'Halloran
7.	8,821,922	9/2/14	Compositions and Methods for Polymer-Caged Liposomes	Sang-Min Lee, Sonbinh Nguyen, Thomas O'Halloran
8.	8,772,029	7/8/14	Modulation of Oocyte Meiotic Progression and Oocyte Activation	Miranda Lee Bernhardt, Alison Kim, Betty Kong, Thomas O'Halloran, Teresa Woodruff
9.	8,246,983	8/21/12	Encapsulated Arsenic Drugs	Haimei Chen, Thomas O'Halloran
10.	7,262,301	8/28/07	Zinc-Chelating Ratiometric Fluorescent Probes and Related Methods	Thomas O'Halloran, Masayasu Taki
11.	7,105,680	9/12/06	Zinc-Chelating Ratiometric Fluorescent Probes	Thomas O'Halloran, Masayasu Taki

12.	5,786,496	7/28/98	High Oxidation State Metal Oxo Complexes of the Phab Ligand	Thomas O'Halloran, Frederick MacDonnell, Nathaniel Fackler
13.	5,534,542	7/9/96	Methods and Materials Relating to A Bi-Metallic Cross-Linking Species	Thomas O'Halloran, Stephen P. Watton

ORGANIZATION OF SCIENTIFIC MEETINGS

- Organizer, Quantitative Elemental Mapping for the Life Sciences; Annual Symposium (2021)
- Organizer, Quantitative Elemental Mapping for the Life Sciences; Workshop Symposium (2022)
- Organizer, CR-PSOC Symposium “Chromatin Unveiled” (2018)
- Organizer, CR-PSOC Meeting “Metallomes, Mito-tones & Chromosomes” (2017)
- Co-chair, Annual Basic Science Colloquium, “Cancer at the Chemical Level: Strategies, Therapies and New Horizons” (2005)
- Organizer, Chemistry of Life Processes Institute Inaugural Symposium, (2004)
- Chairman, Gordon Conference “*Metals in Biology*”, Ventura, CA (2002)
- Chairman, Gordon Conference “*Microbial Stress Response,*” Henniker, NH (2000)
- Co-organizer, NIH workshop “*Bioinorganic chemistry and Drug Design*”(2000)
- Session Chair, Gordon Conference “*Metals in Biology,*” Ventura, CA (2000)
- Session Chair, “*International Conference on Biological Inorganic Chemistry (ICBIC 9)*” Minneapolis, MN (1999)
- Organizer: ASBMB Fall Symposium "*Zinc and Copper Receptors in Signaling, Trafficking and Disease,*" Lake Tahoe, CA, (Oct., 1997)
- Co-organizer: ACS Symposium "*Biological Chemistry of Copper*" ACS National Meeting, Orlando FL, (1996)
- Session Chairman: Gordon conference, “*Metals in Biology,*” (1996).
- Co-organizer-ACS Symposium: "*Environmental Aspects of Inorganic Chemistry*" San Diego, (Inorganic Division) (1994)
- Co-organizer: "*The Inorganic Chemistry/Molecular Biological Interface*". UCLA Symposia on Molecular Biology. Location: Taos, NM (1990).

CONSULTANCIES AND SCIENTIFIC ADVISORY BOARDS

- | | |
|-----------------------------|-------------------------------------|
| 1. Eli Lilly & Company | 10. Genetics Institute |
| 2. F. Hoffmann-LaRoche AG | 11. Nebraska EPSCo |
| 3. Proctor & Gamble Company | 12. OhmX, (SAB) |
| 4. I.E. DuPont & Company | 13. Viamet Pharmaceuticals Holdings |
| 5. Ciba-Gigy | 14. Tactic Pharma, LLC (active) |

SCHOLARLY ACTIVITIES IN ADDITION TO DEPARTMENTAL RESPONSIBILITIES**I. Faculty Advisor:**

- Undergraduate Chemistry Council ACS Student Affiliates (1989-1993)
- Alpha Chi Sigma Professional Chemistry Fraternity (1997-2004)
- Faculty Associate, Shepard Residential College, Northwestern University (1989-1998)

II. Editorial Boards

- *ACS Chemical Biology* (2005-present)
- *Chemistry & Biology* (2002-2016)
- *Current Opinion in Chemical Biology* (1997-present)
- *Dalton Transactions* (2003-2005)
- *Inorganic Biochemistry* (1992-present)
- *Inorganic Chemistry* (1995-1998)
- *Journal of Biological Inorganic Chemistry* (1995-2008)
- *Metallomics* (2008-2013)
- *The New Biologist* (1989-1992)

III. Grant Reviewer/Journal Referee (*selected*)

NSF	<i>Inorganic Chemistry</i>
NIH (BMT Study Section 1996-2000)	<i>Biochemistry</i>
<i>Nature</i>	<i>Dalton Transactions</i>
<i>Science</i>	<i>Metallomics</i>
<i>EMBO Journal</i>	<i>PNAS, Guest Editor</i>
<i>Journal of American Chemical Society</i>	<i>Chemistry and Biology</i>
<i>Journal of Biological Chemistry</i>	<i>PLoS ONE</i>
<i>Cell</i>	<i>Nature Chemical Biology</i>
<i>FEBS Letters</i>	<i>Nature Chemistry</i>
<i>iScience</i>	<i>Nature Communications</i>
<i>PLoS Biology</i>	<i>Theriogenology</i>

IV. Civic Engagement

- Les Cheneaux Watershed Council (2021-present)
- Little Traverse Conservancy, Cedarville Bay Preserve Trail Steward (2016- present)
- Host Committee Member, Goombay Bash, H Foundation, LaGrange, IL (2014-15)
- Oncofertility Academy Volunteer, Women's Health Research Institute (2008-present)
- Physical Science Weekend Academy (2011-2013)
- Loyola Dune Restoration Committee, Chicago, IL (2008-present)
- Assistant Scout Master, Troop 13, Kenilworth IL (2000-2006)
- Order of the Arrow, Boy Scouts of America, Northeast Illinois Council, (elected 2006)
- Assistant Coach, Evanston AYSO Soccer, (1992-1994)

Publications

<http://scholar.google.com/citations?user=BeoS7YUAAAAJ&hl=en&oi=ao>

(H Factor = 84; > 28,000 citations)

1. **O'Halloran, T.V.**; Malin, J.M., "Cis-bis-(Dimethylsulfoxide)tetraammine-cobalt(III) and related complex ions" *J. Nucl. Inor. Chem.*, 1978, 41, 117-119.
2. Malin, J.M.; Ryan, D.P.; **O'Halloran, T.V.**, "Thermal and Light-Induced Electron Transfer between Iron(II) and Cobalt(III) Mediated by Bridging Pyrazines." *J. Amer. Chem. Soc.*, 1978, 100, 2097-2102.
3. **O'Halloran, T.V.**, "Pentacyanoiron(III) Pyridine Derivatives: Topological Probes for Electron Transfer Proteins." Master's Thesis, University of Missouri, Columbia, 1980, 1-75.
4. **O'Halloran, T.V.**; Lippard, S.J., "¹⁹⁵Pt NMR Investigation of the Head-to-Head to Head-to-Tail Isomerization of α -Pyridonate-Bridged Ethylenediamine Platinum(II) Dimer." *J. Amer. Chem. Soc.*, 1983, 105, 3341-3342.
5. Ginsberg, A.P.; **O'Halloran, T.V.**; Fanwick, P.E.; Hollis, L.S.; Lippard, S.J., "Electronic Structure and Optical Spectrum of cis-Diammineplatinum α -Pyridone Blue: Metal-Metal Bonding and Charge Transfer in a Four-Atom Pt(2.25) Chain." *J. Amer. Chem. Soc.*, 1984, 106, 5430-5439.
6. **O'Halloran, T.V.**; Roberts, M.M.; Lippard, S.J., "Correlation between Metal-Metal Distances and Optical Spectroscopy in the Platinum Blues: Synthesis, Crystal Structure, and Electronic Spectrum of Ethylenediamineplatinum α -Pyridone Blue." *J. Amer. Chem. Soc.*, 1984, 106, 6427-6428.
7. **O'Halloran, T.V.**; Lippard, S.J., "The Chemistry of Platinum in the +3 Oxidation State." *Isrl. J. Chem.*, 1985, 25, 130-137.
8. **O'Halloran, T.V.**; "Structural, Theoretical, and ¹⁹⁵Pt NMR Solution Studies of the Platinum Blues and Related Clusters Containing Platinum in the +2 and +3 Oxidation States." Doctoral Thesis, Columbia University, New York, 1985, 1-273.
9. **O'Halloran, T.V.**; Roberts, M.M.; Lippard, S.J., "Synthesis, Structure, and ¹⁹⁵Pt NMR Solution Studies of a Reactive Binuclear Platinum(III) Complex: [Pt₂(en)₂(C₅H₄NO)₂(NO₂)(NO₃)](NO₃)₂·0.5 H₂O." *Inorg. Chem.*, 1986, 25, 957-964.
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192. Blayney MB, Nierenberg D, **O'Halloran TV**, Wilcox DE, Winn JS. Twenty-Five Years Ago—Remembering the Life and Loss of Professor Karen E. Wetterhahn. *ACS Publications*; 2022.

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194. Chen YY, Chen S, Ok K, Duncan FE, **O'Halloran TV**, Woodruff TK. Zinc dynamics regulate early ovarian follicle development. *Journal of Biological Chemistry*. 2022. (in revision)

RESEARCH FUNDING HISTORY

I. Current Funding:

1. "Mechanistic Studies of the MerR and Fur Metalloregulatory Protein"
NIH R01 GM038784
Institution: Northwestern University
 - a) 07/87 - 06/92: Total Direct Costs: \$350,000
Priority Score: 117/500 corresponding to top 0.5th percentile
 - b) 07/92 - 06/96: Total Direct Costs: \$532,837 (Competitive Renewal)
Priority Score: 127/500 corresponding to top 2.0 percentile
 - c) 11/95: Administrative Supplement: \$10,000
 - d) 07/96 - 06/00: Total Direct Costs: \$690,421 (Competitive Renewal)
Priority Score: 120/500 corresponding to top 7.0 percentile
 - e) 2001 - 2011: MERIT (Method to Enhance Research in Time) Award.
Total Direct Costs: \$220,000 per year
 - f) 2009 - 2012: ARRA Award Administrative Supplement \$312,980
 - g) 2012 reverted to R01 GM 038784, renewal in March 2016
Total Annual Costs: \$354,280
 - h) 06/2015: Equipment Supplement (GM038784-27S10): \$225,000
 - i) 03/01/2017 - 02/28/2023: (No Cost Extension)
Priority Score: 26, corresponding to the 8th percentile
Total Annual Costs: \$ 576,986 (Y1- Y4)

2. "Regulatory Roles of Zinc Fluxes in Metalloprotein Occupancy and Cell Cycle Progression"
NIH/NIMGS R01GM11484
 - a) 5/2015- 12/2021 Principal Investigators: T. V. O'Halloran and Teresa Woodruff
Priority Score: 27, corresponding to the top 11.0 percentile
Institution: Northwestern University
Total Annual Cost: \$330,000 (Y1-Y4)
 - b) 01/2022 – 12/2026 Principal Investigators: T. V. O'Halloran
Priority Score: 15, corresponding to the top 2.0 percentile
Institution: Michican State University
Total Annual Cost: \$446,531 (Y1)

3. "Resource for Quantitative Elemental Mapping for the Life Sciences"
NIH/NIGMS P41-GM181350
Principal Investigators: T.V. O'Halloran and Chris J. Jacobsen
Institution: Michican State University
Project Period: 07/01/20 - 05/31/25
Annual Direct Costs: \$1,443,771
Total Costs: \$6,779,853

II. Completed Project Funding:

1. "Metal Ions in Proteins"
Distinguished New Faculty Award,
The Camille & Henry Dreyfus Foundation
Award amount: \$25,000
01/87-12/92
2. Presidential Young Investigator Award (no title)
National Science Foundation CHE 8657704
Total direct cost: \$312,500 (\$187,500 matching funds obtained from private sources)
07/87-12/92
3. "Development of Novel Inorganic Tools for the Isolation of Metalloregulatory Proteins
and Other Eukaryotic Transcription Factors."
National Searle Scholars Program
Total direct cost: \$180,000
7/87 - 7/90 (non-renewable)
4. "Mechanistic Studies of the MerR Metalloregulatory Protein"
NIH (FIRST) grant GM38784
Percent Appointment: 50%
Total direct cost: \$350,000
07/87 - 08/92
5. "Influence of Metal on Protein Structure"
Gillette Grant (unrestricted)
The Gillette Company
Total direct cost: \$9,000
01/87 - 12/93
6. "Presidential Young Investigator Matching Funds"
General Electric Corporation
Total direct cost: \$10,000
12/87 - 12/88
7. "Presidential Young Investigator Matching Fund"
Exxon Educational Foundation
Total direct cost: \$10,000
01/87 - 01/88
8. Eli Lilly Grantee Award (unrestricted)
Eli Lilly Company
Award Amount: \$20,000
11/89 - 11/91
9. "Investigation of Gene Regulatory, Heavy Metal Receptors as Components of
Biosensors"
Office of Naval Research (DOD)

- Total direct cost: \$180,000
12/89 - 11/92
10. "Presidential Young Investigator Matching Funds"
General Electric Corporation
Total direct cost: \$10,000
12/89 - 12/90
 11. Sloan Research Fellowship
The Alfred P. Sloan Foundation
Award Amount: \$30,000
09/91 - 08/93
 12. "Metal Responsive Gene Regulation and Detoxification"
National Institute of Health R01 GM45972
Annual Direct Costs: \$397,799 (4 yr.)
(Priority Score: 124/500 corresponding to top 1.5th percentile)
04/01/91 - 03/31/95
 13. "Camille and Henry Dreyfus Teacher-Scholar Award"
Camille and Henry Dreyfus Foundation, Inc.; TS-93-70
Award: \$60,000
05/93 - 05/94
 14. "Cytotoxicity Studies of Merplatin and Estrogen-Merplatin Derivatives in Cisplatin-resistant Ovarian and Breast Cancer Cell Lines"
Robert H. Lurie Cancer Center, Lester Wood Research Fund Grants
P.I.s: T. V. O'Halloran and Guy M. Boike, M.D.
Total Costs: \$17,500
03/93 - 03/94
 15. "Development of Novel Drugs for Treatment of Metastatic Cancers"
Boughton Charitable Trust
PI: T. V. O'Halloran
Total period Direct Costs: \$150,000
11/95 - 10/98
 16. "Copper Proteins in Metal and Oxidant Stress Response"
NIH R01GM54111
PI: T. V. O'Halloran; 15% effort
a) 02/97-3/01; Total Direct Costs: \$520,569
Priority Score: 150/500 corresponding to the top 11th percentile
b) 04/01-03/05; Total Direct Costs: \$855,000
Priority Score: 127/500 corresponding to the top 1.8th percentile
c) 12/05-11/10; Total Direct Costs: (\$206,007)
Priority Score: 113/500 corresponding to the top 0.9th percentile
d) Supplement (joint with Prof. Rosenzweig)
Direct costs: \$48,000

- Project Period: 02/98 – 01/99
- e) Supplement
Direct costs: \$25,000
Project Period: 09/99 – 08/00
17. "Molecular and Cellular Mechanisms of Zinc Homeostasis"
NIH R01DK52627
PI: T. V. O'Halloran; 20% effort
First year direct cost: \$150,525; Total Direct Costs: \$465,256
Priority Score: 158/500 corresponding to the top 13th percentile
Project Period: 05/98-03/01
18. "A Biochemical Pathway Regulating CuZnSOD Activity: Chemistry of the Copper Chaperones for Superoxide Dismutase"
ALS Association
PI: T.V. O'Halloran
Total Direct Costs: \$31,000
8/98-7/99
21. Guggenheim Fellowship
John Simon Guggenheim Foundation
PI: T.V. O'Halloran
Total Direct Costs: \$31,000
Project Period: 09/98-06/99
22. "Environmental Catalysis Center"
National Science Foundation
PI: Peter Stair
First two year direct costs (for TVO project): \$60,000
Project Period: 09/98-08/03
23. "Console upgrade for 600 MHz NMR at Northwestern University
NIH
P.I.: T.V. O'Halloran
First Year Direct Cost: \$267,000; Total Direct Costs: \$267,000
Project Period: 04/99-03/00
24. "Mechanism-Based Inhibitors of Superoxide Dismutase"
ALS Association
P.I.: T.V. O'Halloran
Direct Costs: \$56,957
Project Period: 2/01-1/02
25. "Chemical Approach to Myeloma & Pancreatic Cancer"
NCI 1U56CA110019-1
AP4 Center Planning Grant
Principal Investigator: T.V. O'Halloran
Total Annual Direct Costs: \$50,000

Project Period: 06/04-05/05

26. "Nanomaterials for Cancer Diagnostics and Therapeutics"
NIH U54 CA119341 (NCI-CCNE Program)
Project #4: "Nanoscale Encasement and Targeted Delivery of Multifunctional Therapeutic Agents for Hematological Cancer and Solid Tumors"
PI: Thomas V. O'Halloran, 10% effort, Project 4 Budget: \$231,221 direct costs
(PI for Cancer Center for Nanotechnology Excellence (CCNE): Chad A. Mirkin)
Project Period: 09/05-08/10
27. "Chicago Islet Consortium ICR at Northwestern"
In Response to RFA-RR-05-003
Project IV: "Optimizing Transition Metal Physiology in Human Islets"
PI: Thomas V. O'Halloran, 5% effort, Project IV Direct Cost: \$100,000
(Awarded as subcontract to University of Illinois at Chicago)
28. "Therapeutic Nanovessels for the Treatment and Imaging of Her2/Neu Positive Breast Cancers"
USAMRMC
Primary Investigator: T. V. O'Halloran
Annual Direct Costs: \$30,000
Project Period: 03/08-02/11
29. "Targets for Development of Novel Anti-Infective Agents"
Viamet Pharmaceuticals (Sponsored Research Agreement)
Principal Investigator: T. V. O'Halloran
Total Direct Costs: \$250,000
Project Period: 08/06-08/10
30. "Institute for Proteomics and Nanobiotechnology at Northwestern University, Evanston, IL"
NASA (NNA06CB93G)
Principal Investigators: Ronald Naylor and T.V. O'Halloran
Capital equipment grant: \$928,982
31. "Targeted Nanobins to Treat Basal-like Breast Tumors"
USAMRMC/CDMRP (BC076723)
Principal Investigator: T. V. O'Halloran
Total Direct Costs: \$75,000
Project Period: 09/08-09/10
32. "The Inorganic Signature of Life: Signaling Pathways in the Mammalian Oocyte"
W. M. Keck Foundation
Principal Investigators: T.V. O'Halloran and T.K. Woodruff
Total Direct Costs (from WMKF): \$1,600,000
Institutional Support: \$324,912
Project Period: 07/08-06/13

33. "Spark Award- Support for an Innovative Cryo-STEM for Element-Specific Imaging of Cells and Tissue"
The Searle Funds
Principal Investigator: T.V. O'Halloran
Annual Costs: \$93,300
Project Period: 03/09-02/11
34. Prostate SPORE
NIH/NCI (P50CA090386)
Principal Investigator: Chung Lee
Pilot Project Principal Investigator: T.V. O'Halloran
Total Direct Costs: \$40,000
Project Period: 03/10-01/11
35. "Pilot Project for Center for Reproductive Research: Structure Function Studies of Zona Pellucida Proteins in Zona Hardening: Role of Zinc in Fibril Formation"
NIH/NICHHD
Principal Investigator: T.K. Woodruff
Pilot Project Principal Investigator: T.V. O'Halloran
Current Annual Costs: \$100,000
Project Period: 04/11-03/13
36. Clinical Translation of Nanobin Encapsulated Arsenic Trioxide in Breast Cancer."
Lynn Sage Cancer Research Foundation
Principal Investigator: T.V. O'Halloran
Annual Costs: \$42,000
Project Period: 09/11-08/12
37. "Targeting Solid-tumor Vasculature with Coencapsulated Arsenic and Platinum-based Nanobins"
NIH/NCI
Principal Investigator: M. Upreti
Subcontract, Co-Investigator
Total Direct Costs: \$22,738
Project Period: 04/13-03/14
38. "Hormonal Signals that Regulate Ovarian Differentiation"
NIH/NICHHD (P01HD021921)
Principal Investigator: K.E. Mayo
Co-Investigator Project 3: T.V. O'Halloran
Total Annual Direct Costs: \$226,553
Project Period: 09/11-08/14
39. "Coding, Decoding Transfer and Translation of Information in Cancer"
NIH/NCI (U54CA143869)
Principal Investigator Project 1: T.V. O'Halloran
Overall Principal Investigator: T.V. O'Halloran
Overall Total Annual Direct Costs: \$1.6 M

- Project 1 Annual Direct Costs: \$273,734
Project Period: 9/11-8/15
40. "Tumor Targeted Nanobins for Treatment of Metastatic Breast and Ovarian Cancer"
NIH/NCI U01CA151461 Cancer Nanotechnology Partnership Platform
Principal Investigator: T.V. O'Halloran
Total Annual Direct Costs: \$343,268
Project Period: 10/12-9/15
 41. "An ICP-MS for Advanced Speciation and Metallomics Analysis"
NIH S10OD020118 BRS Shared Instrument Grant
Principal Investigator: T. V. O'Halloran
Total Direct Coast: \$267,611
Project Period: 04/15 – 04/16
 42. "(PDQ5) Imaging Systemic Tissue Injuries Induced by Anticancer Drugs"
NIH/NCI R01CA185214
Principal Investigators: T.V. O'Halloran and Ming Zhao
Total Annual Direct Costs: \$322,430
Project Period: 05/14 – 04/18
 43. "Regulatory Roles of Zinc Fluxes in Metalloprotein Occupancy and Cell Cycle Progression"
NIH/NIMGS R01GM11484
Principal Investigators: T. V. O'Halloran and T. K. Woodruff
Supplement 08/16: \$50,000
 44. "Optical Ultrastructural Investigation of Neuroprotection from Zinc in Experimental Glaucoma"
PIs: H. Zhang, T.V. O'Halloran, and J.B. Troy
Chemistry of Life Processes Institute, Cornew Innovation Award.
Total Direct Costs: \$50,000
 45. "Laser Ablation Inductively Coupled Plasma Time-of-Flight Mass Spectrometer for Advanced Bioelement Imaging Applications"
NIH/OD S10-OD026786-01
Principal Investigator: T. V. O'Halloran
Project Period: 08/01/2019 – 07/31/2021
Total direct costs: \$657,890
 - . "Spatio-Temporal Organization of Chromatin and Information Transfer in Cancer"
NIH/NCI U54CA193419
Principal Investigator: T. V. O'Halloran, Ph.D. and Jonathan Licht, M.D.
Institution: Northwestern University
Overall Total Annual Direct Costs: \$1.4 M, 05/15 – 04/20
 - a) Project 1 (Project PI: TVO) Annual Direct Costs: \$287,892
 - b) Administrative Supplement 09/01/16 – 08/31/17 Direct Costs: \$100,000
 - c) Administrative Supplement 09/01/10 – 08/31/18 Direct Costs: \$74,54

d) Cost Extension 05/01/20 – 04/30/22 Direct Costs: \$327,717

III. Contributor/Preceptor in Successful Departmental Grants

- 1) EPR/ENDOR Spectrometer (NIH)
- 2) 300 MHz NMR Spectrometer (NIH)
- 3) 600 MHz NMR Spectrometer (NSF-NIH)
- 4) Computer Graphics Facility (DOE)
- 5) Molecular Biology Training Grant (NIH)
- 6) Biophysics Training Grant (NIH)
- 7) ICP Spectrometer (NSF)
- 8) GC Mass Spec (NIH)
- 9) Molecular Toxicology Training Grant (NIH)
- 10) Cancer Center Support Grant (Director of a Basic Research Group) (NCI/NIH)
- 11) Center of Cancer Nanotechnology Excellence (NCI/NIH)
- 12) Physical Science Oncology Center (NCI/NIH)
- 13) Cryo STEM (Keck Foundation)
- 14) Cryo STEM (SPARK Award Chicago Biomedical Consortium)
- 15) Carcinogenesis Training Grant (NCI/NIH)
- 16) Chemistry of Life Processes Training Grant (T32 NIGMS/NIH)
- 17) Molecular Biophysics Training Grant (T32 NIGMS/NIH)
- 18) Biotechnology Training Grant (T32 NIGMS/NIH)
- 19) Cell and Molecular Basis of Disease Training Grant (T32 NIGMS/NIH)

INVITED LECTURES

I. *National and International Meetings*

1987

1. **Gordon Conference**, "*Metals in Biology*," Santa Barbara, CA. (1/87)
2. **American Society of Biological Chemists**, Philadelphia, PA. (6/87)
3. **Third International Conference on Bioinorganic Chemistry**, Noordwijkerhout, Netherlands. (8/87)

1988

4. **UCLA Symposium on Molecular Biology**, "*Metal Ion Homeostasis*," Frisco, Colorado.
5. **American Chemical Society** -- Third Chemical Conference of North America, Toronto, Canada (session chairman; speaker).
6. Tutorial: **ACS Meeting**, Toronto, Canada
7. **First International Meeting of Molecular Mechanisms of Metal Toxicity and Carcinogenicity** -- Urbino, Italy. (9/88)

1989

8. **Metals in Biology Gordon Conference**, Ventura, CA (1/89).
9. **NIH International Workshop**: "*Genetic Response to Environmental Adversity*," Arlie, VA (4/89).

10. **Gordon Conference**, "*Nucleic Acids*," Hampton, NH (6/89).
11. **4th International Conference on Bioinorganic Chemistry**, Boston, MA (7/89).
12. **NSF International Workshop**, "*Molecular Recognition*," Stamford, England, (10/89).
13. **American Chemical Society International Chemical Congress of Pacific Basin Societies**, Hawaii (12/89).

1990

14. Session Chairman: **Gordon Conference**, "*Metals in Biology*," Ventura, CA (1/90).
15. **Society of Toxicology** Annual Meeting, Metals Specialty Division, Miami, FL (3/90).
16. Co-organizer: **UCLA Symposium on Molecular Biology**, "*The Inorganic Chemistry/molecular Biology Interface*," Taos, NM (2/90).
17. **American Chemical Society** National Meeting, "Inorganic Chemistry in Biotechnology" Boston, MA (4/90).
18. Tutorial: **American Chemical Society** National Meeting, Boston, MA (4/90).
19. "*Structure and Dynamic Aspects of Metal Complexes in Biological Systems*," Okazaki Conference (**Institute for Molecular Sciences**), Okazaki, Japan (10/90)
20. "*Frontiers in Bioinorganic Chemistry*", Kyoto Japan (10/90)
21. **Materials Research Society National Meeting**, Symposium on "*Materials Synthesis Based on Biological Processes*." Boston, MA (11/90)
22. "*Frontiers in the Chemistry of Metal Ions Approaching the Year 2000*", Florence Italy (12/90)

1991

23. "*Gene Expression*", **American Chemical Society** Joint Central-Great Lakes Regional Meeting, Indianapolis, IN, 5/91 (TVO invited, talk given by D.M. Ralston)
24. **FASEB Conference**: "*Transcriptional Activator Proteins*." New Hampshire (7/91), Federation of American Society for Experimental Biology.
25. "**International Conference on Bioinorganic Chemistry**" Satellite Meeting: Metal-Responsive Gene Expression, Oxford, England (8/91).
26. "*Marine Bioinorganic Chemistry Symposium*", **ACS-Fourth Chemical Conference of North America**, New York, NY (8/91)
27. "*Metal Ion Biosensor Workshop*" **Office of Naval Research**, Washington DC, (12/91)
28. "*Molecular Aspects of the Sequence-specific Binding of Metal Compounds to DNA*" **Royal Dutch Academy of Science**, Leiden, Netherlands (12/91)

1992

29. "*Metals in Biology*", **Gordon Conference**, Ventura, CA, (1/92)
30. "*Metal Ion/Molecular Biology Interface*", **Keystone Colloquium**, Lake Tahoe, CA, (3/13/92)
31. "*Fundamental Mechanisms of Transcription*", **Keystone Colloquium**, Copper Mountain Colorado, (3/28/92)
32. "**Copper Coordination Chemistry: Bioinorganic Perspectives**", Johns Hopkins University, Baltimore, MD (8/92)
33. "**NSF Inorganic Biochemistry Workshop**", University of Georgia, (8/92)
34. "**Bioinorganic and Biotechnological Aspects of Environmental Chemistry**", Florence, Italy (8/92)

1993

35. "*Second International Meeting on Molecular Mechanisms of Metal Toxicity and Carcinogenicity*" Madonna di Campiglio, Italy, (1/93)
36. **ACS/ASBMB** Joint Meeting "*Metals and Gene Expression Symposium*", (Organizer & Speaker) San Diego, CA (6/93)
37. "*International Conference on Bioinorganic Chemistry*" (ICBIC-6) La Jolla, CA (8/93)
38. "Biodegradation and Treatment of Nitroaromatics in the Environment: (Workshop) Northwestern University, Evanston IL (8/93)
39. "Stress Responses" **Swiss Institute for Experimental Cancer Research**, Villars, Switzerland (9/93)

1994

40. "*Environmental Aspects of Inorganic Chemistry*" Symposium (Co-Organizer): **ACS** National Meeting, San Diego (3/94)
41. **Inorganic Chemistry Gordon Conference** (7/31 -8/4/94)
42. **University of Pennsylvania**, "*Symposium in Molecular Biology*" (8/94)
43. *2nd European Conference on Bioinorganic Chemistry (EUROBIC II)*, Florence, Italy (8/30/94 - 9/3/94)
44. "*Molecular Reaction Mechanisms Involving Transition Metals: Experimental & Theoretical Aspects*" Florence, Italy (10/94)
45. Symposium "*Molecular and Cellular Toxicology with Human Applications*" **Wayne State University** (11/94)
46. *Josef Fried Symposium in Bioorganic Chemistry*, **University of Chicago** (11/94)

1995

47. **Metals in Biology Gordon Conference**, Ventura, CA (1/95)
48. "*Metal and Oxygen Regulation of Gene Expression*", **Keystone Symposium**, Park City, UT, (3/95)
49. "*Micronutrients: Trace Elements*" **FASEB** Summer Research Conference, Copper Mountain, CO (6/95)
50. "*Metal Ions in Biology and Medicine*", **American Chemical Society International Chemical Congress of Pacific Basin Societies**, Honolulu, HA (12/95)

1996

51. "*Metals in Biology*", **Gordon Conference**, Session Chairman, Ventura, CA (1/96)
52. *Frontiers in Biomedical Research*, **Annenberg Center for the Health Sciences**, Indian Wells, CA (2/96)
53. "*Biomarkers to Toxic and Carcinogenic Metals*," Park City, Utah (3/96)
54. **American Society for Biochemistry and Molecular Biology**, New Orleans, LA (6/96)
Biocatalysis Satellite Meeting
55. **American Society for Biochemistry and Molecular Biology**, New Orleans, LA (6/96)
Schering Plough Award Lecture
56. **American Society for Microbiology**, National Meeting, New Orleans, LA (6/96)
57. "*Inducible Genomic Responses*", **American Association for Cancer Research**, Stevenson, WA (6/96)

58. "*Biological Chemistry of Copper*" Symposium Chair & Speaker, ACS National Meeting, Orlando, FL (8/96).
59. **Metals in Biology Symposium** University of Kyoto, Japan (12/96)

1997

60. "*Metals in Gene Expression*" Annual Meeting of **The Society for Experimental Biology** University of Kent, Canterbury, (3/97)
61. "*Copper Transport and Its Disorders: Molecular and Cellular Aspects*" Satellite Meeting of the **European Human Genetic Society**, Sestri Levante, Italy (5/97)
62. **25th Annual Steenbock Symposium** University of Wisconsin at Madison, Wisconsin (6/97)
62. **Eighth International Conference on Bioinorganic Chemistry (ICBIC 8)** Yokohama, Japan (7/97)
63. **The Fourth International Metallothionein Meeting** Kansas City, MO. (9/97)
64. **Karen Wetterhann Memorial Symposium** Dartmouth College, New Hampshire (9/97)
65. **ASBMB Fall Symposium: Copper and Zinc Receptors in Signaling, Trafficking and Disease** Lake Tahoe, CA (10/97)

1998

66. *Metals in Biology*, **Gordon Research Conference**, Ventura, CA (1/98)
67. **Asian Transcription Conference**, Lorne, Australia (2/98)
68. **Metals and Genes**, Toronto, Canada (5/98)
69. **FASEB**, Portland, Oregon (6/98)
70. **Inorganic Chemistry Gordon Research Conference**, RI (7/98)
71. **Microbial Stress Response Gordon Research Conference**, Henniker, NH (8/98)
72. **American Chemical Society Annual Meeting**, Boston, MA (8/98)
73. **International Coordination Chemistry Conference** Florence, Italy (9/98)
74. **International Conference on Metal-binding Proteins in Biology**, Banff, Canada (10/98)
75. *Integrating Cellular Stress Responses*, **The Banbury Meeting**, Cold Spring Harbor, NY (11/98)
76. *Zinc in Human Health*, **NIH Workshop**, Bethesda, MD (11/98)

1999

77. **Partners in Science**, Research Corporation, Tucson, AZ (1/99)
78. *St. Louis Award Symposium*, **American Chemical Society National Meeting** (4/99)
79. *Chemistry of Metals in Biological Systems*, **European Research Conference, Society of Biological Inorganic Chemistry and European Science Foundation**, Tomar, Portugal (5/99)
80. **Quinone and Redoxactive Amino Acid Cofactors Gordon Research Conference** Meriden, NH (6/99)
81. **Copper Homeostasis and its Disorders** Ravello, Italy (9/99)
82. **Stress and Human Disease** Lake Bluff, IL (10/99)

2000

83. *Metals, Metalloenzymes, and Global Change*, **American Chemical Society National Meeting**, San Francisco, CA 03/00
84. Keynote Address: **Center for Environmental Bioinorganic Chemistry**, Princeton University, NJ (6/00)

85. *Metals in Medicine: Targets, Diagnostics, and Therapeutics* NIH Bethesda, MD (6/00)
86. Chairman, **Microbial Stress Response Gordon Research Conference**, Salve Regina, RI (7/00)
87. *14th Symposium of the Protein Society*, San Diego, CA (8/00)
88. *Molecular Genetics of Bacteria & Phages*, NY (8/00)
89. *Lippard Symposium*, Boston, MA (10/00)

2001

90. **Metals in Biology Gordon Research Conference**, Ventura, CA (01/01)
91. *Metals and Cells* Canterbury, England (04/01)
92. George W. Raiziss Biochemical Rounds **University of Pennsylvania Department of Biochemistry and Biophysics**, Philadelphia, PA (2/01)
93. Oxidative Stress **Gordon Research Conference**, Ventura, CA (3/01)
94. **Enzymes, Coenzymes and Metabolic Pathways Gordon Research Conference**, Kimball Academy, Meriden, NH (7/01)
95. Guest speaker, **International Conference on Bioinorganic Chemistry (ICBIC 10)**, University of Florence, Florence, Italy (8/01)
96. Guest speaker, **3rd International Meeting on Molecular Mechanisms of Metal Toxicity** Alghero, Sardinia, Italy (9/01)

2002

97. Chair, **Metals in Biology Gordon Research Conference**, Ventura, CA (1/02)
98. **Pittcon Lecture**, ACS Local Section, Pittsburgh, PA (03/02)
99. **37th EU Chem Conference on Stereochemistry** Bürgenstock, Switzerland (04/02)
100. **Environmental Bioinorganic Chemistry Gordon Research Conference**, Proctor Academy, Andover, NH (06/02)
101. **Microbial Stress Response Gordon Research Conference**, Salve Regina Univ., Newport, RI (07/02)
102. *Protein Folding in the Cell* **FASEB** Summer Research Conference, Saxtons River, VT (07/02)
103. *NIGMS at 40* at the Fall **ACS** Meeting, Boston, MA (08/02)
104. Inorganic Section Session, Lecturer, Co-Chair, Fall **ACS** meeting, Boston, MA (08/02)
105. **3rd International Meeting on Copper Homeostasis and Its Disorders** Ischia Porto, Italy, (10/02)
106. **Neurological Aspects of Wilson's Disease Symposium** Miami, FL (11/02)

2003

107. Chair, **Metals in Biology-Gordon Research Conference**, Ventura, CA (1/03)
108. **Asian School of Bioinorganic Chemistry symposium**, Okazaki, Japan (03/03)
109. **Oxidative Stress Gordon Research Conference**, Ventura, California (03/03)
110. **Midwest Metals Conference**, Washington University, St. Louis, MO (05/03)
111. **International Conference on Bioinorganic Chemistry (ICBIC XI)**, Cairns, Australia (07/03)

2003

- 107. Chair, **Metals in Biology Gordon Research Conference**, Ventura, CA (1/03)
- 108. **Asian School of Bioinorganic Chemistry symposium**, Okazaki, Japan (03/03)
- 109. **Oxidative Stress Gordon Research Conference**, Ventura, California (03/03)
- 110. **Midwest Metals Conference**, Washington University, St. Louis, MO (05/03)
- 111. **International Conference on Bioinorganic Chemistry (ICBIC XI)**, Cairns, Australia (07/03)

2004

- 112. **Metals in Biology Gordon Research Conference**, Venture, CA (01/04)
- 113. **American Society of Microbiology Conference**, New Orleans, LA (05/04)
- 114. **Third Annual Midwest Metals Meeting**, Ann Arbor, MI (06/04)
- 115. **Zinc Signals 2004**, Aarhus, Denmark (06/04)
- 116. Chair, **FASEB Summer Research Conference**, Snowmass, CO (06/04)
- 117. **American Chemical Society National Meeting**, Philadelphia, PA (08/04)
- 118. **7th European Biological Inorganic Chemistry Conference**, Garmisch-Partenkirchen, Germany (08/04)
- 119. **1st International IMBG Meeting on Homeostasis of Metals**, Grenoble, France (09/04)
- 120. **American Chemical Society Molecular Basis of Life Processes Workshop**, Washington, D.C. (09/04)
- 121. **4th International Meeting on Copper Homeostasis and Its Disorders: Molecular and Cellular Aspects**, Ischia Porto, Italy (10/04)
- 122. **Howard Hughes Medical Institute-Instituto de Biologia Molecular y Celular de Rosario**, *Molecular Basis of Bacterial Stress Responses*, Rosario, Argentina (10/04)

2005

- 123. **Metals in Biology Gordon Research Conference**, Venture, CA (01/05)
- 124. **Oxidative Stress Gordon Research Conference**, Ventura, California (03/05)
- 125. **39th ESBOC Symposium 2005** ('Gregynog Symposium 2005'), Wales, UK (05/05)
- 126. **FASEB Prokaryotic Transcription Meeting**, Saxton's River, VT (06/05)
- 127. Cell Biology of Metals **Gordon Research Conference**, Lewiston, Maine (07/05)
- 128. **12th International Conference on Biological Inorganic Chemistry**, Ann Arbor, MI (08/05)
- 129. **Second International Congress on Stress Responses in Biology and Medicine**, Tomar, Portugal (09/05)

2006

- 130. **FASEB Trace Element Micronutrients: Integrating Basic & Applied Research Meeting**, Snowmass, CO (06/06)
- 131. **International Symposium on Speciation of Elements in Biological, Environmental and Toxicological Sciences**, Bialowieza, Poland (06/06)
- 132. **Microbial Stress Response Gordon Research Conference**, Mount Holyoke, MA (07/06)
- 133. **2nd International Symposium on Biomolecular Chemistry**, Konan-Fiber, Japan (08/06)
- 134. **Zinc Signals meeting, 6th World Conference on Zinc Biology**, Siena, Italy (09/06)
- 135. **5th International Copper Meeting**, Alghero, Italy (10/06)

- 136. **International Workshop on Wilson disease and Other Disorders of Copper Metabolism at NIH**, Bethesda, MD (11/06)
- 137. **Alexian Brothers Hospital Network CME Consortium**, Hoffman Estates, IL (04/06)
- 138. **American Medical Association Nanotechnology Forum**, Chicago, IL (06/06)

2007

- 139. **Metals in Biology Gordon Research Conference**, Ventura, CA (01/07)
- 140. **American Chemical Society Spring Meeting**, Chicago, IL (3/07)
- 141. **Cell Biology of Metals Gordon Research Conference** (Speaker), Salve Regina, RI (07/07)
- 142. **American Chemical Society Fall Meeting**, Boston, MA (8/07)
- 143. **Biomimetic Research Symposium**, Kyoto, Japan (12/07)
- 144. **Biochemistry and Molecular Biology Meeting 2007**, Yokohama, Japan (12/07)

2008

- 145. **Metals in Biology Gordon Research Conference** (Plenary Speaker), Ventura, CA (01/08)
- 146. **FASEB Trace Element Micronutrients: Integrating Basic and Applied Research Meeting**, Snowmass, CO (6/08)
- 147. **Metals in Medicine Gordon Research Conference**, Andover, NH (7/08)
- 148. **American Chemical Society Fall Meeting** (Basolo Symposium), Philadelphia, PA (8/08)
- 149. **Eurobic 9** (Plenary Speaker), Wroclaw, Poland (8/08)
- 150. **Copper08**, (Danks Award Lecturer), Alghero, Italy (10/08)
- 151. **Advanced Photon Source Workshop**, Argonne National Laboratory, Argonne, IL (10/08)

2009

- 152. **Metals in Biology Gordon Research Conference**, Ventura, CA (01/09)
- 153. **Center for Blood Research**, Scientific Advisory Board, Vancouver, BC (02/09)
- 154. **International Workshop of Biofunctional Chemistry**, (Plenary, Awaji, Japan (7/09)
- 155. **International Conference on Biological Inorganic Chemistry (ICBIC 14)**, Nagoya, Japan (7/09)
- 156. **Cell Biology of Metals Gordon Research Conference** (Speaker), Salve Regina, RI (8/09)
- 157. **University Women's Club**, University of California-Berkeley, CA (08/09)

2010

- 158. **Italian Bio Networking Conference** (Speaker), Chicago, IL (05/10)
- 159. **FASEB Trace Element Micronutrients: Integrating Basic and Applied Research Meeting** (Speaker), Snowmass, CO (06/10)
- 160. **American Chemical Society** (Speaker), Boston, MA (08/10)
- 161. **Inorganic Biochemistry Discussion Group** (Plenary Speaker), Newcastle, England, (09/10)
- 162. **Copper10**, (Danks Lecture Chair), Alghero, Italy (10/10)
- 163. **Cancer Nanotechnology Partnership Platforms meeting** (Speaker), Bethesda, MD, (11/10)

164. **Accademia Nazionale dei Lincei Meeting** (Plenary Speaker), Rome, Italy, (12/10)
 165. **Pacific Chem 2010 International Meeting** (Speaker), Honolulu, Hawaii, (12/10)

2011

166. **University of Zurich, Institute of Inorganic Chemistry**, (Speaker), Zurich, Switzerland (3/11).
 167. **Fertilization and Activation of Development Gordon Research Conference**, (Speaker), Holderness, New Hampshire (7/11).
 168. **Cell Biology of Metals, Gordon Research Conference**, (Speaker), Salve Regina, Rhode Island, (7/11).
 169. **Cancer Nanotechnology Partnership Platform Alliance Meeting**, (Speaker), Boston, Massachusetts, (9/11).
 170. **International Symposium on applied Bioinorganic Chemistry**, (Plenary Speaker), Barcelona, Spain, (12/11).

2012

171. Metallomics and Metalloproteins, Invited lecture, **Metals in Biology Gordon Research Conference**, Ventura, California on January 25, 2012.
 172. Fluxes in Transition Metal Concentration Control Mammalian Egg Development and Fertilization, Invited lecture, **American Chemical Society** annual meeting in San Diego, California on March 29, 2012.
 173. Understanding and Targeting Chromatin Structure, O'Halloran presented at the **Physical Sciences- Oncology Centers** Annual Investigators' meeting in Tampa Bay, Florida on April 18, 2012.
 174. Fluxes in Transition Metal Concentration Control Mammalian Egg Development and Fertilization, Invited lecture, **Trace Elements in Biology & Medicine** meeting in Steamboat Springs, Colorado on June 14, 2012.
 175. Zinc Sparks and Reproductive Biology, Invited lecture, **Metals in Medicine Gordon Research Conference** in Andover, New Hampshire on June 26, 2012.
 176. Fluxes in Cellular Metal Quotas and Control of Mammalian Development, O'Halloran presented the keynote address at the **London Mathematical Society symposium** at Durham University in Durham, England on July 10, 2012.
 177. How Do Cells Control Inorganic Chemistry? Structure and Physiology of Metal-Sensing Transcription Regulatory Proteins, O'Halloran presented at the **British Biophysics Society** in Durham, England on July 11, 2012.
 178. DNA Bending and Unwinding in Transcription and Nucleosome Binding, O'Halloran presented a seminar at **Durham University**, Durham, England, UK on July 9, 2012.
 179. Inorganic Chemistry Controlling Cellular Physiology and Development, O'Halloran presented at the **American Chemical Society** meeting in Philadelphia, Pennsylvania on August 20, 2012.
 180. Therapeutic efficacy of arsenic and platinum: Drug synergy and unexpected inorganic chemistry in combination chemotherapy for triple negative breast cancer. Invited lecture, Winthrop Rockefeller Institute for the **Arkansas Nano Health Conference** on September 26, 2012.
 181. Bringing Innovation in Basic Research Setting to Application in Public Health: Incentives and Hurdles, **ILSI Health and Environmental Sciences Institute, Combining Interdisciplinary & Translational Expertise Workshop** Arlington, VA, 12/6/2012.

2013

182. Inorganic Control of Cellular Decisions: Connecting Transition Metal Fluxes, Receptors and Sensors at the Atomic Level. Plenary Lecture, **International Conference on Bioinorganic Chemistry, ICBIC 16**, Grenoble, France ; July 21, 2013.
183. Zinc Fluxes in Control of Oocyte Maturation, Fertilization and Mammalian Development. Invited lecture, **Cell Biology of Metals Gordon Research Conference** in Newport, RI on July 31, 2013.
184. Tumor Targeted Nanobins for the Treatment of Metastatic Breast and Ovarian Cancers. O'Halloran presented at the **NCI Alliance for Nanotechnology in Cancer** Annual PI meeting on September 17, 2013 in Bethesda, Maryland.
185. Transition Metals in Control of Microbial Physiology, Cancer and Mammalian Development. Keynote Lecture, **Croucher Institute**, Hong Kong, December 15, 2013.
186. Transition Metals in Control of Microbial Physiology, Cancer and Mammalian Development. Invited lecture, **Peking University** in Beijing, China, December 19, 2013.

2014

187. Zinc Sparks: Metalloregulatory Flux Pathways in Mammalian Development Invited presentation, Metals in Biology, **Gordon Research Conference** in Ventura, California on January 29, 2014
188. Zinc fluxes in control of biology: chemical thermodynamic, structural and dynamic studies of zinc sensors, probes and metalloregulatory proteins. Invited presentation, **American Chemical Society** meeting in Dallas, Texas on March 16-20, 2014
189. Invited Lecture **Institute for Molecular Science**, in Okazaki, Japan on March 23, 28, 2014
190. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors Invited presentation, **University of Dublin**, Dublin, Ireland on April 11, 2014.
191. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors Invited presentation at **Birmingham University**, Birmingham, UK on April 14, 2014
192. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors Keynote Lecture at the **Dalton Conference** at Warwick University, Warwick, UK on April 15, 2014.
193. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors. Invited presentation, **Biometals Conference** at Duke University in Durham, NC on July 13, 2014.
194. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors. Invited presentation, **International Society for Zinc Biology** in Asilomar, California on September 15, 2014.

2015

195. Spatio-temporal Fluorescence Metal Analysis at the Single-Cell Level Reveals Zinc Fluxes Controlling Mammalian Cell Cycle and Fertilization. Invited presentation, **Pittcon**, New Orleans, March 9, 2015.
196. Inorganic chemistry in control of cell fate decisions: single cell fluorescence analysis of zinc fluxes regulating mammalian fertilization. Invited keynote lecture at **50th Eurochem Conference on Stereochemistry**, Bürgenstock, Switzerland, April 27, 2015.

197. Structure, dynamics and mechanisms of zinc and iron receptors which regulate gene expression Invited presentation **PacifiChem 2015**, Honolulu, HI, December 15, 2015.
198. Spatio-temporal fluorescence analysis at the single cell level reveals zinc fluxes controlling the mammalian cell cycle Invited presentation **PacifiChem 2015**, Honolulu, HI, December 19, 2015.
199. Inorganic chemistry in control of cell fate decisions: probes for understanding how zinc fluxes regulate mammalian fertilization. Invited presentation **PacifiChem 2015** Honolulu, HI, December 20, 2015.

2016

200. Controlling Gene Expression through DNA Distortion: Structure and Mechanism of Metalloregulatory Proteins. Session Chair and presenter in Transition Metal Chemistry in DNA and RNA Regulation session **American Chemical Society Symposium, Inorganic Division** in San Diego, CA on March 15, 2016.
201. How Do We Accelerate the Early Diagnosis and Treatment of Cancer? Invited presentation at meeting of the **President's Council of Advisors on Science and Technology (PCAST)** at the National Academy of Sciences, Washington, DC on March 25, 2016.
202. Physical Sciences Taking on Cancer: Targeted Therapies for Metastatic Brain Cancer. Keynote Lecture at the 5th annual **Harper Cancer Research Institute Research Day** at Notre Dame University on April 4, 2016.
203. Bioinorganic Drug Discovery: Metal-based Drugs and Targets in the Treatment of Metastatic Cancer Invited presentation, Metals in Medicine, **Gordon Research Conference** in Andover, New Hampshire on June 26, 2016.
204. Elements of Health and Disease: Inorganic Fluxes and Metal Receptors That Control of Cell Fate Decisions. The Annual Dewitt Stetten Jr. Lecture, **National Institutes of Health Director's Afternoon Lecture**, Bethesda MD on Oct 19, 2016

2017

205. Zinc Receptors, Fluxes and Switches in Control of Cell Fate Decisions **Gordon Research Conference** Metals in Biology Ventura, CA on Jan 22, 2017.
206. Metals in the Nucleus: Modulation of Chromatin Structure **Gordon Research Conference** Physical Sciences of Cancer Galveston, TX on Feb 7, 2017.
207. Elements of Brain Function: Metallome Profiles, Zinc Sparks and Inorganic Fluxes. **Chemistry's Role in the Brain Initiative OneChemistry Symposium** Johns Hopkins University, Baltimore, MD on March 28, 2017.
208. Zinc Fluxes in Control of Gamete Maturation and Fertilization **Reproductive Science and Medicine Summit**, Feinberg School of Medicine, Northwestern University on June 12, 2017
209. Transcriptional Control Mechanisms in Emerging Zinc and Copper Stress Responsive Regions **FASEB Research Conference** Mechanism and Regulation of Prokaryotic Transcription, Saxtons River, VT on June 27, 2017.
210. Inorganic Fluxes in Control Cellular Function from Microbes to Mammalian Gametes **Metals in Biology Workshop**, University of Gothenburg, Gothenburg, Sweden October 11, 2017.
211. The Cancer Metallome **Basic to Transitional Understanding in redox Physical Oncology, Society for Redox Biology and Medicine** Baltimore, MD, 11/29/2017.

2018

212. New Regulators of Meiotic Progression: The Zinc Spark and Zinc Flux & Regulation of Sperm Development by Zinc **Princess Nourah bint Abdulrahman University**, Riyadh, Saudi Arabia, February 28, 2018.
213. New Regulators of Meiotic Progression: The Zinc Spark and Zinc Flux & Regulation of Sperm Development by Zinc **19th Royan International Congress on Reproductive Biomedicine**, Tehran, Iran, August 28, 2018.

2019

214. Inorganic Chemistry Regulating Sperm-Egg Interaction before and during Fertilization Keynote lecture at the **19th International Conference on Biological Inorganic Chemistry**, Interlaken, Switzerland, August 16, 2019.
215. Transition Metal Receptors in Control Cell Fate Decisions: Roles for Small Molecules, Macromolecular Structures and Subcellular Compartments Invited lecture, **Keio Symposium on Bio-metal** Keio University, Tokyo, Japan, September 6, 2019.
216. Physiochemical Mechanisms of Metal Ion Fluxes Regulating Cell Cycle Progression and Fertilization Invited lecture. **Kick-off Symposium of Integrated Bio-Metal Science**, Keio University, Tokyo, Japan, September 7, 2019.
217. Zinc Fluxes in Control of Gamete Function: Mechanistic insights into the Oocyte to Egg transition and the Sperm-Egg Interaction Plenary lecture, **International Society for Zinc Biology**, Kyoto, Japan, September 9, 2019.
218. "Accounting for Essential Transition Metals in Cancer and Development" **Sunrise Free Radical School: Back to the Basics, Society for Redox Biology and Medicine**, Las Vegas, NV, November 21, 2019.

2020

219. "Trafficking, Storage and Delivery of Metals" Metals in Biology, **Gordon Research Conference**, Ventura, CA, January 21, 2020.
220. "Function and Evolutionary Conservation of Zinc Sparks in the Mammalian Egg" **5th Upper Egypt Assisted Reproduction Conference**, Cairo, Egypt, February 21, 2020.

2021

221. "Decoding Metal: From Co-Factors to Dynamics and Disease" Metals in Biology, **Gordon Research Conference**, West Dover, VT, October 22, 2021.

2022

222. *Karen Wetterhann Memorial Symposium* Dartmouth College, New Hampshire (9/97)

II. Invited Research Lectures at Other Institutions**1986**

1. University of Illinois, Chicago, IL

1987

2. Notre Dame, South Bend, IN, Dept. of Chemistry
3. Illinois Institute of Technology, Dept. of Chemistry

4. University of Wisconsin, Milwaukee, Dept. of Chemistry
5. Proctor and Gamble Corp., Miami Valley Laboratories, OH
6. State University of New York, Albany, Dept. of Chemistry
7. G.E. Corporation, Central Research and Development, Schenectady, NY
8. Loyola University, Chicago, IL, Dept. of Chemistry

1988

9. Amoco Corporation, Naperville, IL
10. University of Sienna, Italy, Dept. of Chemistry, (9/88)
11. University of Florence, Italy, Dept. of Chemistry, (9/88)
12. University of Turin, Italy, Dept. of Chemistry, (9/88)

1989

13. University of Michigan, Ann Arbor, Dept. of Chemistry, (3/89)
14. University of Illinois, Urbana, Dept of Biochemistry and Biophysics (3/89)
15. University of Minnesota, Minneapolis, Dept. of Chemistry, (4/89)
16. University of Chicago, IL, Dept. of Molecular Biology.
17. University of Missouri, Columbia, Dept. of Chemistry, (8/89)
18. Massachusetts Institute of Technology, Cambridge, MA, Dept. of Chemistry (12/89)

1990

19. University of New York, Buffalo, Dept. of Biochemistry and Molecular Biology (3/90)
20. University of Pennsylvania, Dept. of Chemistry, Philadelphia (3/90)
21. DuPont Central Research, Wilmington, DE (5/90)
22. Texas A&M University, Dept. of Biochemistry (9/90)
23. Eli Lilly and Company, Central Research, Indianapolis, IN (9/90)
24. Osaka University, Osaka, Japan, Dept. of Chemistry (10/90)
25. Suntory Institute for Biomedical Research, Shimamoto-cho, Japan (10/90)
26. Chemistry Department Colloquium: Johns Hopkins University (11/90)
27. F. Hoffmann La-Roche AG, Basel, Switzerland (12/90)

1991

28. University of Cincinnati, Medical School (3/91)
29. Amherst College, MA, Dept. of Chemistry (4/91)
30. Ohio State University, Dept. of Chemistry (4/91)

1992

31. University of California, Berkeley, Dept. of Biochemistry (2/92)
32. University of Wisconsin, Madison, Dept. of Chemistry, (2/92)
33. University of Wisconsin, Madison, Dept. of Microbiology (2/92)
34. Swarthmore College, Dept. of Chemistry, Swarthmore PA (4/92)
35. Cornell University, Ithaca, NY, Dept. of Biochemistry and Mol. Biol. (4/92)
36. Harvard University Medical School, Microbiology Dept., (4/92)
37. Dartmouth College, Dept. of Chemistry, Hanover NH (5/92)
38. ETH-Zurich Switzerland; Institute of Inorganic Chemistry (7/92)
39. Ciba-Gigy; Basel, Switzerland (10/92)
40. Sandoz; Basel, Switzerland (10/92)

1993

41. University of Illinois, Urbana, Chemistry Dept. (2/93)
42. Hope College, Chemistry Department (3/93)
43. Northwestern University, Medical School, Dept. of Physiology (3/93)
44. North Carolina State University, Raleigh, NC, Chemistry Dept. (3/93)
45. University of North Carolina, Chapel Hill, NC (3/93)
46. Northwestern University, Cancer Cell Biology Program (12/93)

1994

47. California Institute of Technology, Div. of Chemistry & Chemical Eng. Pasadena, California (1/94)
48. University of Chicago, Department of Nutrition, Chicago, Illinois (2/94)
49. *Molecular Cell Biology and Biotechnology* Seminar, Virginia Technical Institute, Department of Chemistry, Blacksburg, VA (5/94)
50. University of Illinois at Chicago (5/94)
51. Inorganic Division Seminar, Wayne State University (12/94)

1995

52. Loyola University Medical School, Chicago, Program in Molecular Biology, (1/95)
53. Medical College of Wisconsin, Department of Biochemistry (5/95)
54. University of Sydney, Australia, Department of Chemistry (8/95)
55. University of Melbourne Medical School, Australia, Dept. of Human Genetics (8/95)
56. Northern Illinois University-DeKalb, Graduate Colloquium Program (9/95)

1996

57. University of Illinois at Urbana-Champaign, Department of Biochemistry (2/96)
58. University of Washington, Seattle, Department of Biochemistry (3/96)
59. Northwestern University, Department of Biological Chemistry & Molecular Pharmacology (4/96)
60. Albert Einstein School of Medicine, Department of Biochemistry (4/96)
61. University of Michigan, Ann Arbor; Department of Chemistry (11/96)
62. University of Kyoto, Department of Pharmaceutical Chemistry (12/96)

1997

63. University of Western Michigan, CREST Program (1/97)
64. Emory University, Georgia; Department of Biochemistry (2/97)
65. University of Alabama, Birmingham; Department of Biochemistry (3/97)
66. University of Wisconsin, Milwaukee Distinguished Lecturer Series Dept. of Chemistry (5/97)
67. University of Massachusetts, Amherst; Department of Chemistry (5/97)
68. Princeton University, New Jersey; Department of Chemistry (12/97)
69. Rutgers University, New Jersey, Department of Chemistry (12/97)

1998

70. *Johnson & Johnson Lectureship*, Notre Dame University, Dept of Chemistry, South Bend, IN (4/98)

71. Bowling Green State University, Department of Chemistry, Bowling Green, OH (4/98)
72. University of Wisconsin at Madison, Medical School, Department of Biomolecular Chemistry (5/98)
73. The Children's Memorial Institute for Education and Research, Chicago, IL (6/98)

1999

74. Michigan State University, Department of Chemistry, Lansing, MI (1/99)
75. Johns Hopkins University School of Medicine, Department of Chemistry, Baltimore, MD (3/99)
76. Tulane University School of Medicine, New Orleans, LA (3/99)
77. Washington University, Department of Neurology, St. Louis, MO (3/99)
78. Boston College, Department of Chemistry, Boston, MA (4/99)
79. University of Minnesota, Department of Chemistry, Minneapolis, MN (4/99)
80. University of Florence, Department of Chemistry, Italy (6/99)
81. University of Sienna, Department of Chemistry, Sienna, Italy (7/99)
82. Johns Hopkins University, Baltimore, MD (8/99)
83. University of Missouri, Dept. of Nutrition and Biochemistry, Columbia, MO (8/99)
84. Texas A & M, Dept. of Biochemistry & Biophysics, College Station, TX (10/99)
85. Brandeis University, Department of Biochemistry, Waltham, MA (12/99)

2000

86. Boston University, Department of Chemistry, Boston, MA (2/00)
87. Inorganic Colloquium Harvard/MIT, Department of Chemistry and Chemical Biology, Cambridge, MA (3/00)
88. University of California, Berkeley, Department of Chemistry, Berkeley, CA (3/00)
89. Buffalo University, Buffalo, NY (3/00)
90. Purdue University, Department of Biochemistry, West Lafayette, IN (4/00)
91. University of Iowa, Department of Biochemistry, Iowa City, IA (4/00)
92. University of Kansas Medical School, Kansas City KS (5/00)

2001

93. University of Rochester Chemistry Department, Rochester, NY (11/01)
94. John Innes Center, Norwich, UK (4/01)
95. Metallochaperone symposium, MIT Department of Chemistry (6/01)
96. Tsukuba University, Tsukuba, Japan (6/01)
97. 1st Symposium on the Chemical Biology of Metal Sensors with Switching Functions, Institute of Fundamental Chemistry, Kyoto, Japan (6/01)
98. University of Kyoto, Department of Molecular Engineering, Kyoto, Japan (6/01)
99. National Institute of Genetics, Mishima, Japan (06/00)
100. Stower's Institute, Kansas City, MO (9/01)
101. St. Jude's Hospital Department of Chemical Biology, Memphis, TN (12/01)
102. University of Delaware, Chemistry Dept., (02/02)
103. Centre for Synthesis and Chemical Biology, University College, Dublin, Ireland (12/02)
104. University of Belfast, Belfast, Northern Ireland (12/02)
105. University of Florence, Florence, Italy (12/02)

2003

106. University of Utah, Chemistry Department (02/03)
107. University of Florence, Florence, Italy (07/03)
108. MIT Department of Chemistry (09/03)
109. University of Wisconsin-Madison, Bacteriology Dept. (10/03)

2004

110. Stanford University, Frontiers in Biosciences Seminar Series, Stanford, CA (02/04)
111. MIT, Chris Walsh Symposium (04/04)
112. University of Illinois at Urbana-Champaign, IL (05/04)

2005

113. University of Massachusetts, Amherst, MA (02/05)
114. University of British Columbia, Vancouver, BC (02/05)
115. University of New Hampshire (04/05)
116. University of Michigan, Ann Arbor, MI (10/05)
117. University of North Carolina – Chapel Hill (11/05)
118. CCNE Mini-symposium, Feinberg School of Medicine, Northwestern University (11/05)

2006

119. Nebraska Redox Biology Center's Metals in Redox Biology, Lincoln, NE (09/06)

2007

120. University of Illinois at Chicago, Chicago, IL (02/07)
121. University of South Carolina, Charleston, SC (09/07)
122. University of Texas Southwestern Medical Center, Dallas, TX (11/07)
123. Hokkaido University, Hokkaido, Japan (11/07)
124. Tohoku University, Sendai, Japan (12/07)
125. Nippon Medical School, Tokyo, Japan (12/07)
126. RIKEN Brain Science Institute, Wako, Japan (12/07)

2008

127. Baker Symposium at Cornell, Ithaca, NY (09/08)

2009

128. University Women's Club, University of California-Berkeley, CA (08/09)
129. Lymphoma SPORE meeting, Northwestern University, IL (11/09)
130. Chicago Biomedical Consortium, UIC, Chicago, IL (11/09)

2010

131. Nanotherapeutics Symposium, Lurie Cancer Center, Chicago, IL (04/10)
132. Watanabe Symposium, Indiana University, Bloomington, IN (10/10)

2011

133. Purdue University Cancer Center, (West Lafayette, Indiana (3/11)
134. Chicago Bio Consortium, Science Day, Chicago Illinois (4/11) Walther Cancer
135. Foundation Symposium, Purdue University, West Lafayette, Indiana, (11/11).

2012

136. Fluxes in Transition Metal Concentration Control Mammalian Egg Development and Fertilization, O'Halloran presented seminar at the University of Illinois – Chicago (2/22/2012).
137. Gomberg Lecture: Fluxes in Transition Metal Concentration Control Mammalian Egg Development and Fertilization, Department of Chemistry, University of Michigan (2/16/2012).
138. Zinc fluxes control mammalian development, Department of Developmental Biology at Washington University in St. Louis, MO (9/19/2012).
139. Zinc fluxes control mammalian fertilization and development, Biophysical Dynamics Division, University of Chicago (11/ 27/2012).

2013

140. Allosteric switching from repressor to transcriptional activator occurs via stepwise DNA distortion and promoter remodeling. The Rockefeller University (1/16/2013).
141. Plenary Speaker The Inorganic Face of Life: From Metalloproteins to Cells and Whole Organisms. Zinc Fluxes Control Mammalian Development. Suddath Symposium. Georgia Tech, Atlanta, GA (2/22/2013).
142. Regulatory Biology of the Zinc Metallome in Microbes and Man. Proctor & Gamble, Cincinnati, OH (4/30/2013).
143. Inorganic Signals: Quantitative Subcellular Mapping of Metal Fluxes in Mammalian Development and Disease. Advanced Photon Source (APS) Life Sciences Workshop at Argonne National Laboratory (5/08/2013).
144. Transition Metal Acquisition and Resistance: Battlegrounds in Infectious Disease. FSM Medical Microbiology Immunology Retreat, Williams Bay, WI (9/08/2013).
145. The Chemical Biology of Transition Metal Receptors in Development and Differentiation. Chemistry Department, New York University, New York, NY (10/04/13).
146. Bioinorganic Chemistry at the Interfaces with Developmental Biology, Oncology and Microbiology. Chemistry Department, DePaul University (11/01/2013).
147. Quantitative Subcellular Mapping of Metal Fluxes Reveals New Signaling Pathways in Microbial Physiology and Mammalian Development. Scientific Advisory Council of the Advanced Photon Source at Argonne National Laboratory (11/07/2013). Batavia, IL.

2014

148. Understanding then translating the physics of chromatin structure modulation in cancer. Physical Sciences Oncology Center Annual Meeting, NIH, Bethesda, MD (4/03/2014).
149. Plenary Lecture: Quantitative Subcellular Mapping of Metal Fluxes Reveals New Signaling Pathways in Microbial Physiology and Mammalian Development. Advanced Photon Source Users' Meeting. Argonne National Laboratory (5/12/2014).
150. Zinc Sparks: Metalloregulatory Flux Pathways in Mammalian Development Chemistry Department, Massachusetts Institute of Technology, Cambridge, Massachusetts (5/22/2014).
151. Inorganic Chemistry in Control of Cellular Decisions: Interrogating Metal Ion Fluxes, Receptors and Sensors at the Atomic Level Penn State University in University Park, Pennsylvania (10/09/2014)
152. Chicago Regional Inorganic Colloquium in Chicago, IL (11/22/2014).
153. Inorganic Chemistry of Cellular Decision Making Processes: Structure and Dynamics of Transition Metal Receptors Nagoya University and IMS in Ozaki, Japan (12/15-17/2014)

2015

154. Transition Metal-Receptor Interactions in Control of Cellular Decisions: Gene Regulation via DNA Distortion and Cooperativity-based Mechanisms. Vanderbilt Institute of Chemical Biology, Vanderbilt University, Nashville, Tennessee (1/07/2015)
155. Transition Metal-Receptor Interactions in Control of Cellular Decisions. Williams College, in Williamstown, Massachusetts (3/06/2015)
156. Antibody-Targeted Drug Delivery and Arsenic Trioxide-based Agents for the Treatment of Metastatic Cancer. Collège de France (3/26/2015)
157. Structure, Dynamics and Mechanisms of Transition Metal Receptors which Regulate Gene Expression. Collège de France (3/30/2015)
158. Spatio-temporal Fluorescence Analysis at the Single Cell Level Reveals Zinc Fluxes Controlling Oocyte Cell Cycle and Fertilization. École Normale Supérieure, Paris, France. Chemistry Department Seminar (4/1/2015)
159. Zinc Signaling Receptors in Bacterial and Mammalian Cells: Insights from X-ray Crystallography and Fluorescence Microscopy at Université Joseph Fourier, Grenoble, France (4/7/2015)
160. Inorganic Chemistry Regulating Sperm-Egg Interaction and Embryo Formation. Université Pierre-et-Marie-Curie, Paris, France (4/13/2015)
161. Inorganic Chemistry of Cellular Decision Making Processes: Metallome Changes in Normal and Pathological States. Université Paris 5 René Descartes, Paris, France (4/16/2015)
162. Zinc Fluxes and Sparks Controlling Fertilization: The Chemistry of Metal-Specific Receptors, Transporters, Compartments and Sensors. Metals for Life Symposium honoring 2015 Franklin Medal winner Stephen J. Lippard at the University of Delaware (4/23/2015)
163. Reflections on the Current Status and Future of the Field International Metallomics Workshop Phoenix, Arizona (5/18/2015)
164. Regulation: Transcription Metal Receptors in Control of Gene Expression and Intracellular Trafficking Inorganic Chemistry in Control of Cellular Decision-Making Events. Frontiers in Chemical Research Lecture Series. Texas A&M University, College Station, Texas (10/5/15)
165. Signaling: Zinc Fluxes in Control of Fertilization and Development Inorganic Chemistry in Control of Cellular Decision-Making Events. Frontiers in Chemical Research Lecture Series. Texas A&M University, College Station, Texas (10/6/15)
166. Cancer: Inorganic Signatures of Invasive Cancer and Targeted Delivery of Arsenic Drugs Inorganic Chemistry in Control of Cellular Decision-Making Events. Frontiers in Chemical Research Lecture Series. Texas A&M University, College Station, Texas (10/7/15)

2016

167. Metalloregulation: Mechanisms of Transcription Factors that Switch between Repression and Activation by Altering DNA Topology in the Department of Biochemistry, University of Wisconsin-Madison (2/1/2016)
168. The Periodic Table of Life: Inorganic Chemistry in Drug Discovery and Developmental Biology Olivet Nazarene University, Kankakee, Illinois (4/5/16)
169. Elements of Health and Disease: Inorganic Fluxes and Metal Receptors That Control of Cell Fate Decisions Department of Chemistry, UMass, Amherst (9/22/16)
170. Zinc sparks and the control of the mammalian egg-to-embryo transition Department of Nutrition, University of Wisconsin, Madison (10/13/16)

171. Metal Ion Signals Controlling the Egg-to-Embryo Transition in Mouse, Worm and Frog: Quantitative Visualization of Zinc Fluxes, Oscillations and Sparks Howard Hughes Medical Institute, Janelia Farm Campus, Ashburn, VA (10/20/16)

2017

172. Profiling the Elements of Health and Disease: Metal Fluxes in Control of Cell Fate Decisions, J. Craig Venter Institute, La Jolla, CA (4/6/17)

2018

173. Inorganic Chemistry in Cell Cycle Control: Quantitative Mapping of Subcellular Transition Metal Fluxes Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA (5/4/2018)
174. Physicochemical Signatures of Tumorigenicity: The Breast Cancer Metallome Wake Forest School of Medicine, Winston-Salem, NC (12/12/18)

2022

175. Inorganic Chemistry Regulating Life Processes: Emerging Roles for Quantitative Element-specific Microscopy, Cornell University (3/28/22)
176. Inorganic Chemistry Regulating Life Processes: Emerging Roles for Quantitative Element-specific Microscopy, University of Houston, Houston Texas (3/29/22)