

Kathleen M. Hess

Education

The University of Chicago, Chicago, Illinois
Ph. D. in Chemistry, March 1991

The University of Chicago, Chicago, Illinois
M. S. in Chemistry, March 1989

DePaul University, Chicago, Illinois
B. S., June 1985

Major: Chemistry (ACS accredited)
Minor: Mathematics

Teaching Experience

Senior Lecturer in Chemistry, Brown University, Providence, Rhode Island;
August 2013 to present

Lecturer in Chemistry, Brown University, Providence, Rhode Island;
August 2006 to July 2013

Courses Taught:

- Chemistry0008E: First Year Seminar, Exploration of the chemistry of renewable energy, Writing Designated Course, Fall 2016 and 2017
Enrollment: 16
- Chemistry 0100 (introductory chemistry) Problem session Instructor, Fall 2011
Enrollment: 15 students
- Chemistry 0330 (general chemistry) Lecture Instructor, Fall 2010, Summer 2010, 2011
Enrollment: 60-15
- Chemistry 0330 (general chemistry) Laboratory Instructor, Fall 2009
Enrollment: 500 students, Teaching assistants: 15-20
Summer 2008- 2011
Enrollment: 20-30
- Chemistry 0330 (general chemistry) Laboratory Co-Instructor, Fall 2006- 2008
Enrollment: 500-600 students, Teaching assistants: 15-20
- Chemistry 0350 (1st semester organic) Lecture & Laboratory Instructor, Summer 2017, Team taught with Dr. Eric Victor with a “flipped” classroom for the lecture.
Enrollment: 41
- Chemistry 0350 (1st semester organic) Lecture Instructor, Summer 2012, Team taught with Sarah Taylor implementing active learning in the ‘lecture’ hours
Enrollment: 56
- Chemistry 0350 (1st semester organic) Laboratory Instructor, Spring 2007- 2017
Enrollment: 400-430 students, Teaching assistants: 14-16
Summer 2008-2012
Enrollment: 60, Teaching assistants 4-6
- Chemistry 0360 (2nd semester organic) Laboratory Instructor, Fall 2007-2008, 2010-2013, 2015-2017
Enrollment: 250-300 students, Teaching assistants: 8-15
- Chemistry 0500 (inorganic chemistry) Laboratory Instructor, Spring 2011-2017
Enrollment: 28-36 students, Teaching Assistants: 3

- Chemistry 2870: Departmental Colloquium Class, Fall 2013
Enrollment: 16 first year graduate students
- Chemistry 1660: Instrumental Analysis with Environmental Applications
Team taught with Dr. David Murray and Professor Yongsong Huang, Spring 2014
Enrollment: 6 students

Related Educational Accomplishments:

- Teaching with Technology Award, Model Course Award, for Chem0500 Inorganic Chemistry and Lab Section spring 2016, with Dr. Eric Victor. Award is co-sponsored by the Office of the Dean of the College and the Department of Computing and Information Systems.
- Developed and implemented curriculum for first year seminar course about the chemistry of renewable energy that included hands-on experiments, class discussions, interdisciplinary guest speakers, and writing assignments. Writing designated course (WRIT).
- Online (paperless) laboratory reports and grading was implemented for both organic laboratories (Chem0350 & 0360) in fall of 2016.
- Developed an animation with the Sheridan Center entitled: *What does recrystallization look like at the molecular level?* Fall 2015, <https://vimeo.com/user16611382>
- Revised the laboratory curriculum for general and organic chemistry to incorporate guided inquiry or investigative experiments and green chemistry methodology. Organic curriculum is annually updated.
- Piloted the use of LabArchives classroom version (electronic notebooks) in the Chem0500 laboratory in spring of 2016 and continued implementation in spring of 2017.
- Coordinated and implemented the electronic delivery of all spectra associated with organic and inorganic laboratories to reduce paper consumption of these courses.
- Purchased and incorporated Vernier LabQuest technology into the chem0330 laboratory course in the Fall of 2009. Custom published the laboratory manual for the use of the LabQuests. Implemented the use and availability of accompanying *LoggerPro* software to the 500 students.
- Conducted a daily pre-laboratory lecture and developed lab quizzes for each course. Developed laboratory reports and answer keys for each experiment for the Organic Laboratory courses.
- Custom published all laboratory manuals for Chem0330, the Chem0350 manual in 2008 & 2009, and the Chem0360 manual in 2008 and 2010.
- Revised the laboratory curriculum for Chem0500 (inorganic chemistry) and incorporated modern instruments. Developed laboratory reports and answer keys for all experiments. Paperless lab reports & grading was implemented in Spring of 2012.
- All course content and grades were available for students using the classroom online manger, MyCourses.brown.edu (2006-spring of 2011) or Canvas.brown.edu (fall 2012 to present)

Special Lecturer in Chemistry, Providence College, Providence, Rhode Island;
September 2005-June 2006

Courses Taught:

- Organic Laboratory instructor for 1st and 2nd semester organic chemistry. Fall 2005 and Spring 2006

- Lecture instructor for Contemporary Chemistry, Spring 2006
- Lecture instructor for 2nd Semester General Chemistry, Spring 2006

Related Educational Accomplishments:

Assisted in improving existing experiments and laboratory quizzes for the organic chemistry laboratory.

Assistant Professor of Chemistry, Cypress College, North Orange County Community College District, Anaheim, California; January 1997-June 2005

Courses Taught:

Organic Chemistry, 1st and 2nd semester, Lecture and Laboratory, Fall 2000-Spring 2005

- Allied Health Chemistry, Lecture and Laboratory, Fall 2004-Spring 2005
- Introductory Chemistry, Lecture and Laboratory, Fall 2003-Spring 2004
- Liberal Arts Chemistry, Lecture, Fall 2000-Spring 2003
- General Chemistry, 1st and 2nd semester, Lecture and Laboratory, Spring 1997-Spring 2000

Related Educational Accomplishments:

- *Curriculum:* Revised and validated courses on a regular basis. Developed curriculum for liberal arts chemistry course with a laboratory and jointly developed curriculum with the Physics department for a laboratory based teacher preparation course.
- *Safety:* Updated safety standards on a regular basis in the Department.
- *Lab Exams:* Developed hands-on laboratory exams for 1st semester general chemistry and introductory chemistry. Written exams and notebook quizzes developed for organic chemistry.
- *Lead Instructor:* Coordinated laboratory schedules with adjunct faculty members and the stockroom staff.
- *Calculator Based Data Collection system:* Conducted several experiments using the Vernier system.
- *Textbook Reviewer:* Summer 2004: Reviewed Chapter 7 of the sixth edition of Organic Chemistry by Wade (Prentice Hall.)
- *Laboratory Manual Reviewer:* Summer 2004: Completely reviewed the Introductory Chemistry Laboratory Manual by Corwin (Prentice Hall).

Adjunct Professor of Chemistry, Cypress College, North Orange County Community College District, Anaheim, California,
2nd semester of General Chemistry, Lecture and Laboratory, Fall 1995-Fall 1996

Adjunct Professor of Chemistry, Irvine Valley College, South Orange County Community College District, Irvine, California,
1st semester of General Chemistry, Lecture and Laboratory, Fall 1995-Fall 1996

Graduate Teaching Assistant, The University of Chicago, Department of Chemistry, General and Organic Chemistry Laboratories, September 1985-June 1986

Undergraduate Teaching Assistant, DePaul University, Department of Chemistry, General and Organic Chemistry Laboratories, January 1984-June 1985

Management Experience

Director of Graduate Studies for Chemistry, Fall 2013-Spring 2017.

- Advised and mentored graduate students in the chemistry department.
- Coordinated faculty committees for various program requirements for 60-90 graduate students.

Teaching Assistant Supervisor, Brown University, Fall 2006-present

- Coordinated all teaching schedules of graduate students for each laboratory course taught.
- Conducted active training sessions focusing on general laboratory procedures for each course taught.
- Implemented grading rubrics and developed grading exercises to improve the quality and consistency of the grading of laboratory reports.

Chemistry Department Coordinator, Cypress College, Fall 2002-Spring 2005

- Responsible for all Faculty class assignments (full-time and adjunct).
- Managed chemistry stockroom and personal.
- Represented the department at Division meetings and worked extensively with Dean of Science, Engineering & Math on college related projects.

Research Experience

Visiting Scholar, University of California, San Diego, San Diego, California

August 2014-December 2014. Faculty sponsor: Professor Michael Burkart
Investigated crosslinking of P450 proteins with synthetic suicide inhibitors.

Postdoctoral Fellow, University of California, Irvine, Department of Pathology, March 1995-August 1995. Studied biochemical effects on rats in a hyperoxygenated environment.

Senior Chemist, McGaw, Inc., Biological Test Center, July 1993-June 1994, HPLC and extraction method development for pesticide (C-14 labeled) metabolism studies and stability/residue analysis of various organic compounds. Conducted research by Good Laboratory Practices.

National Institutes of Health Postdoctoral Fellow, University of California, Irvine, Department of Chemistry, March 1991-July 1993. Investigated the chemical mechanisms of degradation of biological molecules by oxygen radicals such as hydroxyl, perhydroxyl, and peroxy.

Research Assistant, The University of Chicago, Department of Chemistry. Thesis Advisor: Professor David G. Lynn, March 1986-March 1991, Dissertation: Initiation of signal transduction pathways by phenolics in plants and bacteria.

Technician, G. D. Searle & Co., Skokie, Illinois, Chemical Development Department, Summer 1985. Worked on large-scale preparations of compounds needed for further biological testing.

Undergraduate Research Assistant, DePaul University, Department of Chemistry, September 1983-June 1985. Researched and carried out the six step synthesis of 2,3-diol-bicyclo[2.2.1]heptan-7-one.

Professional Development

Unpacking Diversity and Inclusion-Professional Development Day

Session 1: Understanding and Navigating the Impact of Stereotype Threat

Session 2: Guide to Supporting Trans and Gender-Nonconforming Students at Brown

February 21, 2017

Dean of College Curriculum Development Grants-First Year Seminar: Chem0080E

Exploration of the Chemistry of Renewable Energy, Spring 2016

Promoting Academic Excellence and Broadening Participation in Science, Technology, Engineering and Mathematics (STEM) Disciplines, Brown University, February 23, 2016

Inclusive Pedagogy, Brown University, February 23, 2016

National Science Foundation (NSF) sponsored Chemistry Collaborations, Workshops & Communities of Scholars (cCWCS) workshop: Chemistry and Art, Clark Atlanta University, Atlanta, Georgia, March 11-13, 2016

Title IX Training, Brown University, Fall 2015

Veteran Student Training, Brown University, Fall 2015

Question, Persuade, and Refer (QPR), Suicide Prevention Training, Brown University, Fall 2015

Science Education for New Civic Engagements and Responsibilities (SENCER) Summer Institute, Worcester Polytechnic Institute, Worcester, Massachusetts, July 20-August 3, 2015

Brown-Penn Association of American Universities Science, Technology, Engineering and Math Teaching Retreat, Brown University, Providence, RI, June 24-25, 2015

Facilitating Learning Online (FLO), Online course offered by Brown's School of Professional Studies, Brown University, Providence, RI, January 12-February 6, 2015.

National Science Foundation (NSF) sponsored Chemistry Collaborations, Workshops & Communities of Scholars (cCWCS) workshop: Renewable Energy, Beloit College, Beloit, Wisconsin, Summer 2014

NSF sponsored cCWCS workshop: Implementing iPads in the Chemistry Curriculum, Atlanta, GA, January 2013.

Certificate IV: The Teaching Consultant Program, The Harriet W. Sheridan Center for Teaching and Learning, Brown University, AY 2012-2013.

Junior Faculty Teaching Fellow of The Harriet W. Sheridan Center for Teaching and Learning, Brown University, AY 2011-12

Certificate I: Sheridan Teaching Seminar: Reflective Teaching, The Harriet W. Sheridan Center for Teaching and Learning, Brown University, AY 2011-12

NSF sponsored Workshop: Research-based Lab Curriculum: The Center for Authentic Science Practice in Education Model of Research, University of Illinois at Chicago, Chicago, Illinois, Summer 2008

Process Oriented Guided Inquiry Learning (POGIL) Laboratory Workshop, Washington College, Summer 2007

NSF Workshop: Teaching Guided-Inquiry Organic Chemistry Labs Workshop, University of California, Irvine, Summer 2007

Cypress College New Faculty Seminar Series, Mentor, Fall 2004 and Spring 2005

Cypress College On-line Training Course, Summer 2004

Professional Activities

Freshmen Advisor, Brown University, Fall 2006- present
4-6 students each academic year

Sophomore Advisor, Brown University, Fall 2007-present
4-5 students each academic year

Chemistry Department STEM Day for local high school students, breakout session participant & coordinator, January 24, 2017

Rhode Island Science Fair Judge, March 18, 2017

Brown University Resources Committee, Lecturer Representative, Fall 2015-Fall 2016 (2 academic years)

STEM TEAM (Team Enhanced Advising & Mentoring) participant, Brown University, Fall 2016-present

Faculty sponsor for Undergraduate Teaching and Learning Awards (UTRA) for two undergraduate students, Summer 2016

CATALYST TEAM participant, Brown University Fall 2015

ChemDUG co-advisor, Spring 2016

Trivia Night at the Science Center participant for ADOCH, Spring 2016

Transformative Conversations@Brown Facilitator, Brown University, Spring 2014-2015

Re-imagining the Brown Campus and Community Strategic Planning Committee
Focus Group Participant, Brown University, Fall 2012

Faculty early adopter of Canvas Learning Management System, Brown University, Fall 2012

Workshop Facilitator for Athena Science Challenge for WISE, Fall 2012

Chemical Demonstrations for the Brown Community, Spring 2012-2014 and 2016
Faculty sponsor

Brown Chemistry Curriculum Committee, Co-chair, Fall 2011-2014

Brown Chemistry Department Peer Review Committee, Fall 2012-2015

Faculty Participant in pilot program for using Turnitin.com at Brown, Spring 2012

Faculty Participant for Evaluation of New Course Management System at Brown, Spring 2011

TEAM (Team Enhanced Advising and Mentoring) participant, Brown University, Fall 2010-
Spring 2013

Safety Committee Member, Brown University Department of Chemistry, Fall 2010-present

Department Representative for Language Evaluations of Chemistry Graduate Students, Brown
University, Fall 2008, 2009, 2010, 2012-2013, 2015, and 2016

Faculty Participant for Ethics Training of Chemistry Graduate Students, Brown University,
Spring 2008, 2009, 2010, 2011, 2012, 2014 and 2015

Brown Science Friday Participant, Spring 2010 to Spring 2016

Chemistry Lecturer Hiring Committee, Brown University, Spring 2008 & 2009

Sheridan Center Faculty Co-Liaison, Brown University, Fall 2007-present

Undergraduate Teaching Instrument Coordinator, Brown University, Fall 2007-present

Orange County Section of the American Chemical Society Education Committee, College
Coordinator, 1999-2005

Presentations

Sheridan Center for Teaching and Learning Presentation: *Applying the flipped classroom model
to a STEM course*

Co-presenter with Eric Victor

Brown University, Providence, RI, October 12, 2017

Biennial Conference in Chemical Education, University of Northern Colorado, Greeley, CO, Summer 2016

Technical Symposium Presenter: Once upon an animation: Looking for connections between laboratory stories and scenarios partnered with visualization practice.

Title: Development of an animation and learning assessment for the process of recrystallization

250th National Meeting of the American Chemical Society, Boston, MA, Summer 2015

Division of Chemical Education, Final paper number: CHEM 445

Title: Transforming learning pathways in the undergraduate chemistry laboratories

Chemistry Collaborations, Workshops & Communities of Scholars (cCWCS):

Success Story Invited Speaker at workshop for Teaching Guided Inquiry Organic Laboratories, University of Minnesota, Twin Cities Campus, MN, Summer 2014

Title: Guided-Inquiry in the undergraduate chemistry laboratories: Stop telling and start investigating

Biennial Conference in Chemical Education, Grand Valley State University, Allendale, MI, Summer 2014

Technical Symposium Organizer and Presenter: The Laboratory as a Platform for Professional Development of Graduate Teaching Assistants

Title: Active training sessions for Teaching Assistants to improve teaching in the laboratory

Biennial Conference in Chemical Education, Grand Valley State University, Allendale, MI, Summer 2014

Technical Symposium Presenter: Integrating Library and Information Resources into Chemistry Curricula

Title: Incorporating library literacy into large classrooms through the laboratory

Biennial Conference in Chemical Education, Grand Valley State University, Allendale, MI, Summer 2014

Poster Session participant with Sandra Russo-Rodriguez and Matthew Zimmt

Title: Problem sessions promote learning communities in introductory chemistry

Sheridan Center Invited Lecture: *Teaching Science Laboratories*, presented with John Stein in Neuroscience department, Brown University, Providence, RI, February 21, 2013

Sheridan Center Poster for the 25th Anniversary Celebration, Brown University, Providence, RI, Fall 2012

Collaboration with Sarah Taylor, Matthew Zimmt, Lee Pedersen, Sarah Levy and Andrew Silverman

Title: Enhancing the learning experience for organic chemistry students at Brown

Biennial Conference in Chemical Education, Penn State University, Summer 2012

Technical Symposia Invited presenter: Chemistry Collaborations, Workshops & Communities of Scholars (cCWCS): Developing Scholarly Communities to Transform Undergraduate Education: cCWCS Assorted Chemistry Scholars

Title: Toward a better undergraduate laboratory

Lynnstock: 60th Anniversary Lynn Lab Reunion, Emory University, Atlanta, GA, Celebration in honor of David G. Lynn, Fall 2011

Sheridan Center Invited Lecture: Science Laboratory for Undergraduates, Brown University, Providence, RI, September 17, 2010

204th National Meeting of the American Chemical Society, San Francisco, CA, April 1992

K. M. Hess and T. A. Dix,

Title: Evaluation and application of N-Hydroxy-2-thiopyridone as a non-metal dependent source of the hydroxyl radical.

204th National Meeting of the American Chemical Society, San Francisco, CA, April 1992

K. M. Hess, M. Medina, J. Aikens, and T.A. Dix,

Title: Non-metal dependent DNA cleavage by superoxide/hydroxyl radical generating system.

20th Annual Keystone Symposia, January 1991

K. M. Hess, M. W. Dudley, D. G. Lynn, R. D. Joerger, and A. N. Binns, *J. Cell. Biochem.*, Supplement 15A

Title: Mechanism of phenolic activation of vir expression in A. tumefaciens: Development of specific inhibitors.

Publications

Quantifying the product distribution of a chemical reaction by ¹H NMR spectroscopy: A cooperative learning approach for the undergraduate organic chemistry laboratory. (2017) C. J. Yennie, R. Hopson, K. M. Hess, *Journal of Chemical Education*, 94, 1383-1387. DOI: 10.1021/acs.jchemed.6b00601

Invited Chapter in American Chemical Society Books, “*Integrating Library and Information Literacy into Chemistry Curricula*”, Editors: Kristen Shuyler, Charity Lovitt, and Ye Li.

Chapter entitled: *Incorporating Chemical Information Literacy into Large Organic Chemistry Classes through the Laboratory*

ACS Symposium Series, Volume 1232, Chapter 6, pp 121-141. October 20, 2016.

DOI:10.1021/Bk-2016-1232.Ch006

Kathleen M. Hess and Lee Pedersen

Mechanistic studies of DNA oxidation and nicking by perhydroxyl, peroxy, and hydroxyl radicals. (1993) T. A. Dix, K. M. Hess, M. A. Medina, S. L. Tilly, and R. W. Sullivan. in *Biological Oxidants and Antioxidants: New Developments in Research and Health Effects*, P. Hochstein and E. Cadenas, eds., Hippokrates Verlag.

Evaluation of N-Hydroxy-2-thiopyridone as a nonmetal dependent source of the hydroxyl radical in aqueous systems. (1992) K. M. Hess, and T. A. Dix, *Anal. Biochem.*, 206, 309-314.

Mechanism of activation of Agrobacterium virulence genes: Identification of phenol-binding proteins. (1992) K. Lee, M. W. Dudley, K. M. Hess, D. G. Lynn, R. D. Joerger, and A. N. Binns, *Proc. Nat. Acad. Sci., USA*, 89, 8666-8670.

The initiation of lipid peroxidation. (1992) T. A. Dix, J. Aikens, and K. M. Hess, in *Biological Free Radical Oxidations and Antioxidants*, pp 2-7, Cleup Press, Padova.

Mechanism of phenolic activation of *Agrobacterium* virulence genes: development of a specific inhibitor of bacterial sensor/response systems. (1991) K. M. Hess, M. W. Dudley, D. G. Lynn, R. D. Joerger, and A. N. Binns, *Proc. Nat. Acad. Sci., USA*, **88**, 7854-7858.

Monitoring alterations in the cellular lipid pool by Fast Atom Bombardment Mass Spectrometry: Implications for Byssinosis. (1988) K. M. Hess, S. R. Kalberg, T. M. Logan, D. G. Lynn, W. S. Lynn, J. Reddish, and J. Barclay, *Proceedings of the 12th Cotton Dust Research Conference*, p. 130-134.

Identification and quantitation of alterations in the cellular lipid pool by Fast Atom Bombardment Mass Spectrometry: Implications for Byssinosis. (1987) T. M. Logan, K. M. Hess, W. S. Lynn, J. Barclay, and D. G. Lynn, *Proceedings of the 11th Cotton Dust Research Conference*, p. 66-70.