DEPAUW UNIVERSITY
Est. 1837

Bryan A. Hanson, Ph.D.

Professor of Chemistry & Biochemistry

Department of Chemistry & Biochemistry
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Education & Positions Held

Fisher Fellow	Fall Semester 2009
Professor of Chemistry, DePauw University	August 2000 to present
Julian Professor of Chemistry in Honor of Jack Cook (endowed chair)	August 2001 to June 2006
Visiting Scholar, Purdue University Dept. of Chemistry (Raftery Lab)	September 2007 to December 2007
Associate Professor of Chemistry, DePauw University	August 1992 to August 2000
Assistant Professor of Chemistry, DePauw University	September 1986 to August 1992
Postdoctoral Associate w/James D. White, Oregon State University	September 1984 to August 1986
Ph.D., Chemistry, University of California Los Angeles, California	September 1984 Ph.D. thesis (Director: Wayne J. Thompson): Studies Directed Toward the Synthesis of Paxilline Analogs: Synthesis of 2,3 Disubstituted Indoles and Vicinal Quaternary Carbon Moieties.
B.S., Biochemistry (with honors), California State University Los Angeles, California	October 1981 Bachelor's Thesis (Director: Stanley H. Pine): Titanium-Mediated Methylenation Reactions. Kinetic Studies as a Mechanistic Probe.

Professional Activities

Publications:

"Alternative Strategies in Response to Saline Stress in Two Varieties of *Portulaca oleracea* (Purslane)" Kristina R. Mulry, Bryan A. Hanson, & Dana A. Dudle *PLoS ONE* 10(9): e0138723. doi:10.1371/journal.pone.0138723 (2015).

"Toxic Plants: A Chemist's Perspective" in Volume 2: Clinical Toxicology, part of the series *Molecular, Clinical and Environmental Toxicology*, edited by Andreas Luch, Birkhäuser, Basel, Switzerland, 2009.

"Application of ^{31}P NMR Spectroscopy and Chemical Derivitization for Metabolite Profiling of Lipophilic Compounds in Human Serum" M. DeSilva, S. Narasimhamurthy, G. A. Nagana Gowda, K. Rosa-Pérez, Bryan A. Hanson, & M. Dan Raftery. *Magnetic Resonance in Chemistry* 47, S74-S80 (2009).

"The Prescribing Habits and Materia Medica of Dr. William D. Hutchings" Ashley Paschal, Justin McNabney and Bryan Hanson. *Pharmacy in History 47(3)*, 94-111, (2005).

Understanding Medicinal Plants: Their Chemistry and Therapeutic Action Haworth Herbal Press, July 2005.

"Conformational Analysis of the Pyrrolizidine Alkaloid Senecionine Using Molecular Mechanics" Bryan A. Hanson* and James D. White. *Journal of the American Chemical Society*, *110*, 6314 (1988).

"An Inexpensive, Foolproof Apparatus for Flash Chromatography" Bryan A. Hanson and Wayne. J. Thompson. *The Journal of Chemical Education*, *61*, 645 (1984).

***R* Software Packages Published:**

ChemoSpec: Exploratory Chemometrics for Spectroscopy, Bryan A. Hanson
github.com/bryanhanson/ChemoSpec

unmixR: Hyperspectral Unmixing with *R*, Anton Belov, Conor McManus, Claudia Beleites, Bryan A. Hanson and Simon Fuller
gitlab.com/chemometrics/unmixR

HiveR: Hive Plots in 2D and 3D, Bryan A. Hanson
github.com/bryanhanson/HiveR

exCon: Interactive Exploration of Contour Data
github.com/bryanhanson/exCon

SpecHelpers: Spectroscopy Related Utilities github.com/bryanhanson/SpecHelpers

LindenmayeR: Functions to Explore L-Systems (Lindenmayer Systems)
github.com/bryanhanson/LindenmayeR

Handy Stuff: Stuff that is, well, Handy. Bryan A. Hanson
github.com/bryanhanson/HandyStuff

FuncMap: Hive plots of *R* package function calls, Bryan A. Hanson
github.com/bryanhanson/FuncMap

hyperChemoBridge: Functions for converting between hyperSpec and ChemoSpec (Spectra) objects
github.com/Chathurga/HyperChemoBridge

Presentations:

"Development of Chemometric Tools for 2D NMR Data Sets" Poster at PANIC (Practical Applications of NMR in Industry Conference), La Jolla (San Diego) California, March 2018.

"Using R to Make Sense of NMR Data Sets" invited talk at PANIC (Practical Applications of NMR in Industry Conference), Hilton Head South Carolina, February 2017.

"A new N-FINDR algorithm and the `unmixR` package for spectral unmixing" C. Belietes, C. McManus, B. A. Hanson, C. Krafft, J. Popp. Poster presented by Claudia Beleites at the Robert-Koch-Institut in Berlin, October 2015.

"unmixR: Hyperspectral Unmixing in *R*" Conor McManus, Simon Fuller, Claudia Beleites, Bryan A. Hanson. Poster at useR! 2014, University of California at Los Angeles, June 30-July 3, 2014.

"Preliminary Metabolomic Investigation of Saline-Stressed *Portulaca oleracea* using ^{1}H NMR", Paulina J. Haight, John S. Harwood, Bryan A. Hanson. Poster at 246^{th} American Chemical Society National Meeting, Indianapolis, September 8-12 2013.

"HiveR: 2 and 3D Hive Plots of Networks" Invited talk at the 8^{th} International *useR!* Conference, Nashville Tennessee, June 12-15, 2012.

"HiveR: 2 and 3D Hive Plots of Networks" Poster at the 8^{th} International *useR!* Conference, Nashville Tennessee, June 12-15, 2012.

"Implementation of ANOVA-PCA in R for Multivariate Exploration" Poster at the 8th International *useR!* Conference, Nashville Tennessee, June 12-15, 2012.

"The Effect of Climate Change on the Medicinal Plant Purslane (*Portulaca oleracea*)" Elizabeth Botts, Matthew Keinsley, Courtney Brimmer, Tanner Miller, Kelly Summers, Dana Dudle & Bryan Hanson. Poster at the 52^{nd} Annual Meeting of the Society for Economic Botany, July 10 - 13, 2011, Missouri Botanical Garden.

"What the Heck is *R*?" Presentation to ITAP students at DePauw University. April 11th 2011.

"A Metabolomics Approach to Medicinal Plants and Climate Change: Adventures at the Intersection of Chemistry and Ecology" Bryan A. Hanson*, Dana Dudle, Elizabeth Botts, Matt Keinsley, Courtney Brimmer, Tanner Miller, Kelly Summers. Seminar presentation at Kenyon College, 4 Nov. 2010.

"ChemoSpec: an *R* Package for the Chemometric Analysis of Spectroscopic Data" *useR!* 2010, Annual R Users Meeting, National Institute of Standards and Technology, Gaithersburg Maryland, July 2010.

"Medicinal Plants & Climate Change: Brought to you by the letter R" Faculty Research Colloquium, DePauw University, February 12^{th} 2010.

"The Calabar Bean: Percy L. Julian & the Synthesis of Physostigmine. An Interesting Twist on African Ethnobotany in the Americas" Presented at the 50^{th} Annual Meeting of the Society for Economic Botany, May 31- June 4, 2009, College of Charleston.

"Chemical and Other Excursions Among Medicinal Plants" Talk presented to the Wabash Valley Section of the American Chemical Society, October 15^{th}, 2008, Indiana State University.

"Assessing *Serenoa repens* (Arecaceae) Quality at the Retail Level Using Spectroscopic and Chemometric Methods" Bryan A. Hanson, Tao Ye, M. Daniel Raftery. Presented at the 49^{th} Annual Meeting of the Society for Economic Botany, June 1-5, 2008, Duke University.

"A Chemist's View of Medicinal Plants" Presentation at the 16^{th} Annual Hobbit Gardens Herb Festival Sept. 9^{th}, 2007.

"The Materia Medica of Dr. William D. Hutchings" Presentation to the John Shaw Billings Society at the Indiana Medical History Museum, September 2006.

"The Materia Medica and Prescribing Habits of Dr. William D. Hutchings" Ashley Paschal, Justin McNabney and Bryan Hanson. 120^{th} Annual Meeting Indiana Academy of Science, October 28-29 2004, Hanover Indiana.

"A Chemist's Perspective on 19^{th} Century Medicine" presentation to the Historic Madision Indiana docents. August 2003.

"Medicinal Plants for Poets: Scientific and Cultural Concepts for Non-Majors" 225^{th} National American Chemical Society Meeting, New Orleans, March 2003. Abstract 161.

"The New Chemistry Curriculum at DePauw University: An Overview" 225^{th} National American Chemical Society Meeting, New Orleans, March 2003. Abstract 648.

"A Chemist's Perspective on 19^{th} Century Medicine" Faculty Forum presentation at DePauw University, September 13^{th}, 2001.

"Designing a Comprehensive Faculty Development Program via a Case Study of the Program at DePauw University" Bryan A. Hanson and four others. 8^{th} National Conference of the Council on Undergraduate Research, Wooster OH, June 2-24, 2000.

"Development of a New Protecting Group for Hydroxylamine" Bryan A. Hanson,* and Richard Pilston. 34^{th} National Organic Symposium, American Chemical Society, Organic Division, Williamsburg, VA, June 11-15, 1995, Poster 104.

"Molecular Mechanics Investigation of Novel DNA Base-Pair Mismatches" Bryan A. Hanson,* Katherine E. Garrett, Kristina L. Thomas, and Cassandra L. Martien. 32^{nd} National Organic Chemistry Symposium, American Chemical Society, Organic Division, Minneapolis, MN, June 16-20, 1991, Poster A-40.

"Molecular Mechanics Investigation of Novel DNA Base-Pair Mismatches" Bryan A. Hanson,* Katherine E. Garrett, Kristina L. Thomas, and Cassandra L. Martien. 1991 Joint Central - Great Lakes Regional Meeting, American Chemical Society, Indianapolis, IN, May 29-31, 1991, Abstract 355.

"Molecular Mechanics Investigation of an RNA Pseudoknot" B. A. Hanson,* G. R. Dieckmann and B. T. Sanderson. 21^{st} Central Regional Meeting, American Chemical Society, Cleveland, OH, May 31-June 2, 1989, Abstract 162.

"Conformational Analysis of the Pyrrolizidine Alkaloid Senecionine Using Molecular Mechanics" Bryan A. Hanson,* and James D. White, 3^{rd} Chemical Congress of North America, June 5-10, 1988, Abstract ORGN 188.

"A Molecular Mechanics Study of the Pyrrolizidine Alkaloid Jacobine" Bryan A. Hanson,* and James D. White, 41^{st} Northwest Regional Meeting, American Chemical Society, June 16-18, 1986. Abstract 191.

Presentations By Students Under My Supervision:

"Preliminary Metabolomic Profiling of Swallowtail Larval Host Plants: Possible Insight into the Evolution of Phenotypic Plasticity" Jessica Boyer* and Bryan Hanson. Presented at the 6^{th} Annual Indiana Local Section American Chemical Society Poster Session, Indianapolis, October 10^{th}, 2005.

"The Materia Medica and Prescribing Habits of Dr. William D. Hutchings" Ashley Paschal*, Justin McNabney and Bryan Hanson. Presented at the 5^{th} Annual Indiana Local Section American Chemical Society Poster Session, DePauw University, October 11^{th}, 2004.

"Chemical and Bioinformatic Approaches to Obtaining the Sequence of Pupal Melanizing Reducing Factor (PMRF)" Peter Hogg* and Bryan Hanson. Presented at the 5^{th} Annual Indiana Local Section American Chemical Society Poster Session, DePauw University, October 11^{th}, 2004.

"Attempted Isolation of Pupal Melanization Reducing Factor (PMRF) in the Spicebush Swallowtail, Papilo glaucus" Kyle Danforth and Bryan Hanson, Fourth Annual Indiana Local Section American Chemical Society Poster Session, Indianapolis, IN October 8^{th} 2003.

"Analysis of the Chemical Constituents Found in the Stonecrop Plants and Apollo Butterflies of the Rocky Mountains" Tyler Green*, Bryan A. Hanson and Dana Garrigan, Indiana Academy of Science, November 3^{rd}, 2000.

"Dr. Hutchings 19^{th} Century Prescriptions: Chemical, Botanical, Pharmacological and Historical Perspectives" Justin McNabney*, Bryan A. Hanson and Michael A. Flannery, Indiana Academy of Science, November 3^{rd}, 2000.

"Analysis of the Chemical Constituents Found in the Stonecrop Plants and Apollo Butterflies of the Rocky Mountains" Tyler Green*, Bryan A. Hanson and Dana Garrigan, 1st Annual Indiana Local Section American Chemical Society Poster Session, Indianapolis, October 9^{th}, 2000.

"Dr. Hutchings 19^{th} Century Prescriptions: Chemical, Botanical, Pharmacological and Historical Perspectives" Justin McNabney*, Bryan A. Hanson and Michael A. Flannery, 1st Annual Indiana Local Section American Chemical Society Poster Session, Indianapolis, October 9^{th}, 2000.

"The Role of Chemical Attractants in the Pollination of Selected Indiana Orchid Species" Dawn M. Ahlgren*, Bryan A. Hanson and Michael A. Homoya, Indiana Academy of Science, October 31^{st}, 1997.

"Biologically Active Components of *Asarum canadense*" Valerie K. Turan*, Dawn M. Ahlgren, Sara E. Peters, and Bryan A. Hanson, Indiana Academy of Science, October 31^{st}, 1997.

"Insights into the Native American Practice of Smudging Plants" Megan L. Hamilton* and Bryan A. Hanson, Butler Undergraduate Research Conference, April 11^{th}, 1997.

"A Linear Free Energy/Mass Spectroscopy Experiment for the Organic Lab" Rebecca A. Achterhof* and Bryan A. Hanson, Butler Undergraduate Research Conference, April 11^{th}, 1997.

"How to Catch the Scent of an Orchid" Sara E. Peters*, Valerie K. Turan, Michael A. Homoya and Bryan A. Hanson, Indiana Academy of Science, November 8^{th}, 1996.

"The Scent of an Orchid" Valerie K. Turan*, Sara E. Peters, Michael A. Homoya and Bryan A. Hanson, Indiana Academy of Science, November 8^{th}, 1996.

"Native American Smudging: GC-MS Investigation of Smudged Medicinal Plants" Brian E. Hulsebus* and Bryan A. Hanson, Butler University Undergraduate Research Conference, April 12^{th}, 1996.

"Investigations into Medicinal Plants Native to Indiana" Jennifer Emley* and Bryan A. Hanson, Butler University Undergraduate Research Conference, April 7^{th}, 1995.

"Computational Investigation of DNA Base Pair Analogs" Cassandra L. Martien* and Bryan A. Hanson, Butler University Undergraduate Research Conference, April 19^{th}, 1991.

"Inverse Electron Demand Diels-Alder Reactions of Imidazoles" Scott Osborne* and Bryan Hanson, Butler University Undergraduate Research Conference, April 20^{th}, 1990.

"Molecular Mechanics Investigation of Novel DNA Structures" Kristina Thomas* and Bryan Hanson, Butler University Undergraduate Research Conference, April 20^{th}, 1990.

"Molecular Mechanics Investigation of Enforced Base Pair Mismatches in DNA - Preliminary Results" K. E. Garrett* and B. A. Hanson, 21^{st} Central Regional Meeting, American Chemical Society, Cleveland, OH, May 31-June 2, 1989, Abstract 161.

"The Effect of Covalent Cross-Linking on DNA Conformation - A Molecular Mechanics Study" Katherine E. Garrett* and Bryan A. Hanson, Butler University Undergraduate Research Conference, April 21^{st},1989.

Other Student Mentoring

Google Summer of Code 2016: Co-mentored Anton Belov (Russian computer science student) in writing new functions for the unmixR package.

Google Summer of Code 2013: Co-mentored Conor McManus (Irish computer science student) in writing the unmixR package.

Students & Senior Theses Supervised

Student	Further Training/Career
John A. Rigdon '87 Thesis: "A Novel Method for the Synthesis of Alpha-Keto Acids and Esters"	M.S. Chemistry – Eastern Illinois Assistant Quality Control Officer ATEC Associates (water treatment company)
Gregg R. Dieckmann '88 Thesis:	Ph.D. – University of Michigan Professor of Chemistry, University of Texas
Jennifer Turner Stanek '88 Thesis: "Preliminary Studies on the Synthesis of Novel Enzyme Inhibitors"	Director, Pharmacia
Katherine E. Garrett '89 Thesis: "Structural Effects of the Substitution of four Covalent Cross Sections into the B-DNA Dodecamer CGCGAATTCGCG"	M.S. – University of Michigan Currently owns her own science supplies business

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Students & Senior Theses Supervised, con't

Student	Further Training/Career
Scott E. Osborne '90	Ph.D. – University of Michigan Proctor and Gamble
Kristina L. Thomas Trinkle '90 Thesis: "Analysis of the Structural Effects of Substitution of Covalent Cross Sections into the B-DNA Dodecamer CGCGAATTCGCG"	Chemical Information Specialist Lilly Laboratories
Belinda Michelle Howe Pereira '91	Great Lakes Chemical Company
Cassandra Lynn Martien Coffey '92 Thesis: "Computational Investigation of Novel DNA Mismatched Base Pair Analogs"	Ph.D. – University of Wisconsin
Mary Joyce Reilly Kaufmann '93	M.D. – Case Western Reserve
Michael J. Lalich '94	M.D. – University of Michigan
Christine Martin Cleveland '94	Analytical Chemist Lilly Laboratories
Johari Miller '94 Thesis: "Investigating Correlations of Structural Parameters in B-DNA by Factor Analysis and Other Methods"	Physician, West Lafayette Indiana
Richard Pilston '95 Thesis: "Investigations into the Synthesis of Suicide Inhibitors: The Development of a Novel Protecting Group for Hydroxylamine"	Ph.D – Carnegie Mellon Managing Director, Plexus Consulting
M. Jennifer Emley '96	Environmental Scientist SIECO Inc.
Andy Fraley '96	Chemist: Moderna Therapeutics, Boston Ph.D. – Boston College
Carla Goodnight '97	
Rebecca Achterhof '98	Pediatrician Philadelphia, PA
Megan Hamilton Hartzell '98	Physician
Lindsay Honholt '98	
Brian Eugene Hulsebus '98	M.S. Chemistry – University of Michigan Account Representative, Fisher Scientific
Sara Elizabeth Peters Luckhaupt '98	Physician Centers for Disease Control at the University of Cincinatti
Valerie Turan Politano '98 Thesis: "Biologically Active Components of *Asarum canadense* Rhizomes"	
Teri Kruezman '99	Physician
Clint Sheets '99 Thesis: "Investigations in Smudging"	Physician
Dawn Marie Ahlgren Chapman '00 Thesis: "Optimizing Smudging Experiments"	Ph.D. – University of California at Davis Sensory Scientist The National Food Laboratory

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Students & Senior Theses Supervised, con't

Student	Further Training/Career
Betsy Hambidge Seitz '00	High School Teacher Central Gwinett High School
Sarah (Batterton) Fleming '02	Pediatrician
Tyler Green '02	Radiologist
Justin McNabney '02	District Attorney, Manhattan
Kyle Danforth '05	Head Student Advisor, Univ. of Colorado Denver
Peter Hogg '05	Orthopedist
Ashley Paschal '06	Dentist
Jessica (Boyer) Klabak '08	Dentist
Tanner Miller '11	Resident Physician
Kelly Summers '11	Optometrist
Courtney Brimmer '12	Medical School
Elizabeth Botts '12	Nursing School
Matt Keinsley '13	Emergency Medical Technician
Paulina Haight '13	Medical School – Case Western
Mathew Kukurugya '13	Graduate Student, Cornell University Dept. of Biological and Environmental Engineering
Vincent Guzzetta '14	Laboratory Technician, University of Chicago Medical School
Dana Sprague '13	Chemical Engineering Intern – Aramco Services Co.
Kristina Mulry '14	Medical School – Indiana University
Shannon Jager '17	
Brian Saulnier '18	
Emma Veon '17	
Meghan Khan '18	

Grants and Fellowships:

"Metabolomic Investigation of Purslane" Faculty-Student Summer Research Grant (with Shannon Jager & Brian Saulnier). Internal Grants Committee, Summer 2015.

"Plants vs. Climate Change" Faculty-Student Summer Research Grant (with Kristina Mulry). Faculty Development Committee, Summer 2013.

Fisher Fellow, DePauw University, Fall Semester 2009. Awarded funds to work on an `R` software package for chemometric analysis of spectra.

Senior Personnel with Prof. Wade Hazel on NSF Proposal No: 0217028 Theoretical and Empirical Studies of a Conditional Strategy: Environmentally Cued Pupal Color in Swallowtail Butterflies. 2003-2005.

Summer Stipend for Course Renewal: "Chemistry 120: Structure and Properties of Organic Molecules" $2,500 Faculty Development Committee, DePauw University, May 2001.

"Geographic and Genetic Variation in Chemical Defenses of Yellow Stonecrop and Apollo Butterflies" Joint project with Dana Garrigan $3,000 Faculty Development Committee, DePauw University, May 1999.

"A Glimpse into 19^{th} Century Indiana Medicine: The Prescribing Habits of Dr. William D. Hutchings, 1876-1903." $1,500 Indiana Historical Society, March 1999 (Co-principal investigator).

"Sedum vs. Parnasius" Joint project with Dana Garrigan, $843.81, Faculty Development Committee, DePauw University, October 1998.

"Chemical Ecology of Indiana's Orchids" $741.50 Indiana Academy of Science, 1996.

"Chemical Ecology of Indiana's Orchids" $333.20 DePauw Faculty Development Committee, 1996.

"Separations and Structure Throughout the Chemistry Curriculum" $27,816 NSF ILI Program, 1995 (Co-Principal Investigator).

"Instructional Excellence: FT-NMR Across the Curriculum" $90,000 William M. Keck Foundation, 1990 (Principal Investigator).

Summer Research Fellowship, $4,000 Petroleum Research Fund, Sponsored by Professor Ken Lipkowitz, IUPUI, Summer 1990.

"Course Renewal: Organic Chemistry, Biochemistry and Spectroscopy" $2,500, Faculty Development Committee, DePauw University.

Conferences Attended:

Practical Applications of NMR in Industry Conference (PANIC) La Jolla (San Diego) California, March 2018.

Practical Applications of NMR in Industry Conference (PANIC) Hilton Head South Carolina, February 2017.

18^{th} Biennial Lilly Grantee Symposium, Indianapolis, March 2016.

17^{th} Biennial Lilly Grantee Symposium, Indianapolis, March 7, 2014.

useR! 2014, University of California at Los Angele, June 30-July 3, 2014.

16^{th} Biennial Lilly Grantee Symposium, Indianapolis, March 10 2014.

246^{th} American Chemical Society National Meeting, Indianapolis, September 8-12 2013.

8^{th} Annual International *userR!* Meeting, Vanderbilt University, June 12-15 2012.

52^{nd} Annual Meeting of the Society for Economic Botany, July 10 - 13, 2011, Missouri Botanical Garden.

useR! 2010, Annual *R* Users Meeting, National Institute of Standards and Technology, Gaithersburg Maryland, July 2010.

50^{th} Annual Meeting of the Society for Economic Botany, May 31- June 4, 2009, College of Charleston.

49^{th} Annual Meeting of the Society for Economic Botany, June 1-5, 2008, Duke University.

Realizing Nature's Potential: The Once and Future King of Drug Discovery, Missouri Botanical Garden, November 10-11, 2006.

Structural Bioinformatics Workshop, DePauw University, January 11-14, 2005. Local Organizer.

International Congress on Natural Products Research, Phoenix, AZ, July 31-August 4, 2004 (45^{th} Annual Meeting of the American Society of Pharmacognosy).

Hands-on Teaching of Bioinformatics, Midwest Instructional Technology Center, Hope College MI, May 13-15, 2004.

44^{th} Annual Meeting, American Society of Pharmacognosy, Chapel Hill NC, July 12-16, 2003.

National Organic Symposium, Bloomington IN June 8-12, 2003.

225^{th} National American Chemical Society Meeting, New Orleans, March 2003.

Indiana Genomics Proteomics Symposium, Indianapolis IN November 15^{th}, 2002.

42^{nd} Annual Meeting of the American Society of Pharmacognosy, Oaxaca, Mexico, July 14-18, 2001.

Midwest Association of Chemistry Teachers in Liberal Arts Colleges (MACTLAC), Upland Indiana, October 20-21, 2000.

8^{th} National Conference of the Council on Undergraduate Research, Wooster OH, June 2-24, 2000.

36^{th} National Organic Symposium, American Chemical Society, Organic Division, Madison, WI, June 13-17, 1999.

217^{th} American Chemical Society National Meeting, Anaheim, CA, March 21-25, 1999.

Indiana Academy of Science, $114th$ Annual Meeting, Indianapolis, IN, October 30^{th}, 1998 (also October 31^{st}, 1997; November 8^{th}, 1996; November 3^{rd}, 1995).

35^{th} National Organic Symposium, American Chemical Society, Organic Division, San Antonio, TX, June 22-26, 1997.

Butler University Undergraduate Research Conference, April 11^{th}, 1997 (also April 12^{th}, 1996; April 7^{th}, 1995; April 19^{th}, 1991; April 20^{th}, 1990; April 21^{st}, 1989).

34^{th} National Organic Symposium, American Chemical Society, Organic Division, Williamsburg, VA, June 11-15, 1995.

33^{rd} National Organic Chemistry Symposium, American Chemical Society, Organic Division, Bozeman, MT, June 13-17, 1993.

High Performance Computing and Grand Challenges in Structural Biology, Florida State University, Tallahassee, FL, January 24-27, 1992.

32^{nd} National Organic Chemistry Symposium, American Chemical Society, Organic Division, Minneapolis, MN, June 16-20, 1991.

1991 Joint Central - Great Lakes Regional Meeting, American Chemical Society, Indianapolis, IN, May 29-31, 1991.

21^{st} Central Regional Meeting, American Chemical Society, Cleveland, OH, May 31-June 2, 1989.

Science Education at the Crossroads, Indiana Academy of Science, December 3^{rd}, 1988.

3^{rd} Chemical Congress of North America, June 5-10, 1988.

41^{st} Northwest Regional Meeting, American Chemical Society, June 16-18, 1986.

Workshops & Courses:

Advanced NMR Users Workshop, JEOL Inc, August 2016.

Introduction to Linear Models and Matrix Algebra, Harvard online MOOC (HarvardX), April 2015.

Statistical Learning, Stanford online MOOC, April 2015.

Taxonomy of California Plants (Bio 531), San Diego State University, Spring 2008. Part of sabbatical.

NSF Day, Butler University, October 5th 2007 (overview of NSF programs).

Tropical Dendrology (offered by The Tropical Science Center) June 25 - July 7, 2007. Various locations in Costa Rica. Funded by DePauw Faculty Development Committee.

Presenting Data and Information (The Tufte Course), October 5^{th} 2006. Indianapolis, IN. Funded by DePauw Faculty Development Committee.

Wetland Flora (plant identification workshop) Institute for Botanical Training, June 6-9, 2006. Indianapolis, IN. Funded by DePauw Faculty Development Committee.

Midwest Upland Flora (plant identification workshop) Institute for Botanical Training, May 16-19, 2006. Indianpolis, IN. Funded by DePauw Faculty Development Committee.

Toxicology: Principles and Practice, presented by the American Chemical Society, December 5-6, 2000, Washington DC. Funded by DePauw Faculty Development Committee.

Chemical Mechanisms in Toxicology, presented by the American Chemical Society, December 7-8, 2000, Washington DC. Funded by DePauw Faculty Development Committee.

Pharmacology for Chemists, presented by the American Chemical Society, March 21-23, 1996, New Orleans, LA. Funded by DePauw Faculty Development Committee.

Human Languages:

English: Native speaker
Spanish: strong reading, writing, listening and speaking skills

Computer Languages:

Proficient: *R*, LaTeX, html, *JavaScript*
Decent: *Objective-C* Some knowledge: *java*, *FORTRAN*, *Swift*

Professional memberships:

Americal Botanical Council
American Chemical Society
American Society for Pharmacognosy
Indiana Section, American Chemical Society
Indiana Native Plant and Wildflower Society
Society for Economic Botany

Miscellaneous:

Reviewer, *PLOS Computational Biology*, 2017 –
Associate Editor, *Economic Botany*, 2010 –
Reviewer, *Economic Botany*, 2009 –
Reviewer, *Journal of Statistical Software*, 2012 –
Reviewer, University of Chicago Press (book proposal), 2013
Reviewer, French National Research Agency, 2012
Reviewer, W. M. Norton (new organic text), 2011
Reviewer, *African Journal of Agricultural Research*, 2011
Reviewer, North Carolina Biotechnology Center, 2009
Reviewer, *Chemical Reviews*, 2010 – 2012
Reviewer, *Biochemistry*, 1991 – 1998
Reviewer, Petroleum Research Foundation, 1992, 1997
Review Panelist, National Science Foundation Instrumentation for Laboratory Improvement Program, Washington D.C., February 1993, January 1994, January 1997.
Review Panelist, National Science Foundation Major Research Instrumentation, Washington D.C., May 2001, October 2009. Chair, Chemistry Section, Indiana Academy of Science, 1996, 1998
Vice-Chair, Chemistry Section, Indiana Academy of Science, 1995, 1997
Presiding Officer, Division of Organic Chemistry, Indianapolis American Chemical Society Meeting, May 1991

Teaching Activities:

Fisher Fellowship, Fall Semester 2009
On Sabbatical, May 2014 to August 2015 (Project: Software for Chemometrics, Medicinal Plant Guide)
On Sabbatical, May 2007 to August 2008 (Project: Plant Metabolomics)
On Sabbatical, May 2000 to January 2001 (Project: Understanding Medicinal Plants)
On Sabbatical, May 1994 to January 1995 (Project: Medicinal Plants of Indiana)

Courses taught:

Current Courses	
Structure and Properties of Organic Molecules	Organic Mechanisms and Reactions
Structure & Function of Biomolecules	Enzyme Mechanisms
Stoichiometric Calculations	
Discontinued Courses	
Principles of Chemistry I, II	Modern NMR Methods
Intro. to Organic Chemistry	Intermediate Organic Chemistry
Biochemistry	Spectroscopy
Medicinal Plants	Metabolism
Medicinal Plants for Poets	
Winter Term Courses	
Medicinal Plants and Tropical Ecology (trip to Peruvian Amazon)	Medicinal Plants and Traditional Healing in Costa Rica
Bio- and Cultural Diversity of Costa Rica	Biomolecular Recognition
Programming Applications	Molecular Modeling
Internship sponsor, multiple years	WT Core
Bio- & Cultural Diversity in Costa Rica	
Other	
Adjunct Faculty, Natural Products Chemistry for the Budding Ethnobiologist, part of the Organization for Tropical Studies Ethnobiology Course. Las Cruces Biological Research Station/Wilson Botanical Gardens, Costa Rica. July 2004; July 2005, July 2006, July 2007.	Options instructor: 1987, 1989, 1991-1995 W and Q certified Developed new biochemistry course with laboratory (1986-1988) Honorable Mention, Outstanding Professor Award, 1991 Special Recognition, Senior Gift Drive, May 2000

University and Department Service

Plant Walk on behalf of the Putnam County Museum, 2 May 2015
Goldwater Scholarship Representative 2003 - 2007
Petitions Committee August 2006 - May 2007, August 2008 - May 2009
Biochemistry Steering Committee, creation through December 2006; Spring 2009 -
Handbook Revision Task Force, 2002 - 2005
Chair, Dept. of Chemistry, 1 January 2001 - 30 June 2006, mid-Fall 2009 - July 2010
Academic Computing Advisory Committee, 1986-1991
    Chair, Fall 1989-Spring 1991
Faculty Development Committee, Fall 1991 - Spring 1994, Fall 1996-Spring 1999, Fall 2016-
    Chair, 1997-1999, 1993-1994
Resource Allocation Subcommittee ??-1999
Library Advisory Committee (ad hoc to the Provost, 1991-1994)
Library Automation Study Committees (assorted)
Search Committees: Library Director, Science Librarian, Hughes Molecular Biology Fellow,
    Botany (1998), Spanish (2000), Molecular Biology (2002), Microbial & Molecular Biology (2003)
Board of Visitors Panelist, 1991
Student Marshall, 1990-1994
Options Instructor: 1987, 1989, 1991-1995
Co-Organizer, Burkett Lecture Series 1994-present
Organizer, Chemistry Department Seminar Series 2003 - 2008
Instrument Maintenance Technician for IR, NMR, GC-MS instruments
Science Fair Judge, West Central Regional Science Fair, March 2004

Guest Lecturer:

"A Perspective on Medicinal Plants in Developing Cultures" for Jon Macy's Public Health Class, Nov. 1999
"Amazonian Ethnomedicine" for Lakshmi Fjord's Health, Medicine and Culture class, Nov. 2000 and Nov. 2001

Significant Posts Outside the University

President, Greencastle Plan Commission (January 2002 - January 2007)