Curriculum Vitae
Professor Kenneth L. Brown

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Education

Oral Roberts University	Chemistry	B.S., 1993
Oklahoma State University	Chemistry	Ph.D., 1999

Positions Held

Research Assistant, Dowell Schlumberger, 1994-1995.
Analytical Chemist, Lab One Analytical, 1993-1994.
Professor of Chemistry, Hope College, 2015-Present.
Associate Professor of Chemistry, Hope College, 2006-2015.
Assistant Professor of Chemistry, Hope College, 2002-2006.
Assistant Professor of Chemistry (Term), Hope College, 1999-2002
Teaching Assistant, Department of Chemistry, Oklahoma State University, 1995-1999.

Courses Taught (15 different courses)

General Chemistry I, General Chemistry Laboratory I, General Chemistry II, General Chemistry Laboratory II, Analytical Chemistry, Analytical Chemistry Laboratory, Chemical Aspects of Ethnobotany, GEMS: Atmospheres and Environmental Change, First Year Seminar (Big Things in Small Packages), Accelerated General Chemistry, Accelerated General Chemistry Laboratory, GEMS: Chemistry of the Environment (Classroom and Laboratory), GEMS: Abrupt Climate Change, Day1 Watershed and First Year Seminar, and Advanced Lab Techniques: Separations.

New Courses Developed and Taught

Big Things in Small Packages as a First Year Seminar
Chemical Aspects of Ethnobotany
Advanced Lab Techniques: Separations

Active Research Areas:

- Electrochemistry: preparation and characterization of chemically modified electrodes; using electrochemical impedance spectroscopy to understand charge-transfer properties in polymer thin films; preparation of glucose biosensors on new paper-based platforms; development of electrochromic surfaces.

- Neuroscience in collaboration with Professor Leah Chase: using electrochemistry and LC-MS techniques to understand the biochemical transformation of homocysteine to homocysteic acid; understanding the role of homocysteine and homocysteic in bipolar mental disorders.

- Environmental Justice: Research with the Universities of Purdue, Notre Dame, Valparaiso in global health, and air, soil, and water quality; an emphasis in environmental justice cases in the state of Indiana, specifically, Northern Lake County, IN. Developed and framed a new organization (Northern Lake County Environmental Partnership) in the state of Indiana; https://facebook.com/northern.lake.environment.

- Phytochemistry in collaboration with Professor Jianhua Li: using analytical chemistry to understand phylogentics of plant species.

Publications (*Undergraduate Student co-authors: 40 undergraduate co-authors)

21. K.L. Brown. "Electrochemical Detection of Hydrazine Using Ruthenium bis(1,10-Phenanthroline)(4-Methyl-4'vinyl-2,2'-Bipyridine) Polymer Films in Flow Injection Analysis." J. Phys. Chem. Res. **2021**, 3(3): 01-06.

20. K.L. Brown, O. Banks*, and B. Kraay*. "Preparation and Cyclic Voltammetric Characterization of Three-Dimensional Macroporous Electrodes." *Int. J. Chem. Stud.,* **2021**: 9(2): 01-05.

19. K.L. Brown, R. Danforth*, E. Bleitz*, Y. Hwang*, and D. Rens*. "Cyclic Voltammetric and Spectroelectrochemical Studies of Tris(5-amino-1,10-Phenanthroline)Iron(II) Polymer Films," *Int. J. Electrochem. Sci*., 15, **2020** 10707 – 10721.

18. Polik, W.F., Stewart, J.L., Brown, K.L. (2020). Electrochemistry: Galvanic Cells and the Nernst Equation. https://www.ionicviper.org/lab-experiment/electrochemistry-galvanic-cells-and-nernst-equation. ViPer, **2020**.

17. K.L. Brown, Book Chapter in Voltammetry, "Electrochemical Preparation and Characterization of Chemically Modified Electrodes," *InTech*, **June 12, 2019.**

16. J. Li, M. Stukel*, P. Bussies*, K. Skinnner*, A.R. Lemmon, E.M. Lemmon, K.L. Brown, A. Bekmetjev. N.G. Swenson. "Maple Phylogeny and Biogeography Inferred from Phylogenomic Data," *Journal of Systematics and Evolution*, **2019**, 57(6), 594-606.

15. K.L. Brown, K.A. Cushman*. "Development of Optimization of a Glucose Biosensor Based on Tris[5-amino-1,10-Phenanthroline]Iron(II) Polymer Films," *Int. J. Chem.*, **2018**, 10 (2), 16-24.

14. J. Li, K.G. Murray, P. Li, and K.L. Brown. "Differential Diversifications of South American and Eastern Asian Disjunct Genera *Bocconia* and *Macleaya* (Papaveraceae)," *Journal of Systematics and Evolution*, **2017**, 56(1), 25-34.

13. E. M. Sanford, M. E. Tori*, T.M. Smeltzer*, C.K. Beaudoin*, B.H. Bowser*, M.E. Anderson, and K.L. Brown. "Cyclic Voltammetric, Chronocoulometric, and Spectroelectro-chemical Studies of Electropolymerized Films Based on (3,4-Ethylenedioxy-thiophene)-Substituted 3,6-Dithiophen-2-yl-2,5-dihydropyrrole[3,4-c]pyrrole-1,4-dione." *Electrochemistry, The Electrochemical Society of Japan*, **2015**, 83(12), 1061-1066.

12. K. Brown, J. Li, K. Wirth*, E. Wilkins*, J. Tufts*, and F. Bahema*. "Determination of Genistein and Protein Content in *Apios Carnea and Apios Fortunei from China, and Apios Americana," Modern Applied Science,* **2015**, 9(1), 109-118.

11. J. Li, J. Jiang, H. Vander Stel*, A. Homkes*, J. Corajod*, K. Brown, and Z. Chen, "Phylogentics and Biogeography of *Apios* (Fabaceae) inferred From Sequences of Nuclear and Plastid Genes," *International Journal of Plant Sciences*, **2014**, 175(7), 764-780.

10. K. Klunder*, F. Heckman, K.L. Brown, and G.F. Peaslee, "A Study of Dissolve Gas Dynamics in Mixed Stream Electrolyzed Water," *Electrochemistry, The Electrochemical Society of Japan,* **2012**, 80(8), 574-577.

9. K.L. Brown, X. Hou*, O. Banks*, K.A. Krueger*, J. Hinson*, G.F. Peaslee, P.A. DeYoung, S.M. Alger*, J. Benzer*, T. Neils, "Characterization of Tris (5-amino-1,10-phenanthroline) Ruthenium(II/III) Polymer Films Using Cyclic Voltammetry and Rutherford Backscattering Spectrometry," *Inter. J. Chem.,* **2011**, 3(4), 12-19.

8. K.L. Brown, and S.B. Gray*, "Cyclic Voltammetric Studies of Electropolymerized Films Based on Ruthenium(II/III) bis(1,10 phenanthroline)(4-methyl-4'vinyl-2,2'-bibyridine)," *Inter. J. Chem*, **2010**, 2, 2, 3-9.

7. T.B. Higgins, K.L. Brown, J.G. Gillmore, J.B. Johnson, G.F. Peaslee, and D.J. Stanford, "Successful Student Transitions from the Community College to the Four-Year College Facilitated by Undergraduate Research," *Council on Undergraduate Research*, **2011**, 31(3), 16-22.

6. K.N. Pearson, K.L. Brown, H.L. Dershem, K.W. Murray, C.C. Barney, and M.N.F. Lee, "Enriching a Culture of Research: Extending Opportunities to a Broader Community," *Council on Undergraduate Research: Broadening Participation in Undergraduate Research*, Edited by M.K. Boyd and J.L. Wesemann, **2009**, 167-178.

5. D.J. Gonthier*, T.J. Sullivan, K.L. Brown, B. Wurtzel*, R. Lawal*, K. VandenOever*, Z. Buchan*, and T.L. Bultman, "Stroma-Forming Endophyte Epichloe Glyceriae Provides Wound-Inducible Herbivore Resistance to it Grass Roots," *Oikos*, **2008**, 117, 629-633.

4. J.S. Pinter*, K.L. Brown, P.A. DeYoung, G.F. Peaslee, "Amperometric Detection of Hydrazine by Cyclic Voltammetry and Flow Injection Analysis Using Ruthenium Modified Glassy Carbon Electrodes," *Talanta*, **2006**, 71, 1219 -1225.

3. K.L. Brown, J.S. Pinter, *, K. Ewing*; T.R. Ruch,*; M. Ambrose* and I. Hesselsweet,* "Amperometric Detection of Glucose Involving Electropolymerized Tetraaminophthalocyanine and Ferrocene Films," *Analytical Letters*, **2005**, 38(5), 769-780.

2. K.L. Brown, J. Shaw*, M. Ambrose* and H.A. Mottola, "Voltammetric, Chrono-coulometric and Spectroelectrochemical Studies of Electropolymerized Films Based on Co(III/II)-and Zn(II)-4, 9, 16, 23-Tetraaminophthalocyanine: Effect of High pH," *Microchemical Journal*, **2002**, 72, 285-298.

1. Brown, K.L. and Mottola, H.A. "Voltammetric, Chronocoulometric, and Spectro-electrochemical Studies of Electropolymerized Films Based on Cu(II/I)-4, 9,16, 23-Tetraaminophthalocyanine," *Langmuir*, **1998**, 14(12), 3411-3417.

Presentations and Invited Talks

21. Chemistry Department Seminar Series, Seminar, "*Is There Not a Cause?" North Lake County Partnership of Community and Academic Leaders to Address Environmental Justice Issues*, Hope College, Holland. (October 1, 2021).

20. *Winter Happening Presentation: Chemical Aspects of Ethnobotany*, Hope College, 2015.

19. *Sabbatical Presentation: Overview of Research Projects*, Hope College, 2015.

18. *Sabbatical Presentation: Overview of Research Projects*, Gentex Corporation, Zeeland, MI, June 26, 2014.

17. *Nuts and Bolts of Crafting the R&D Research Manuscript*, Gentex Corporation, Zeeland, MI, June 20, 2014.

16. *Measurements Based on Impedance: Theory and Application*, Gentex Corporation, Zeeland, MI, April 3, 2014.

15. *R-Hydroquinone Study: R-Hydroquinone, Where Are You?* Gentex Corporation, Zeeland, MI, April 3, 2014.

14. Academic Reality Check: Maintaining Your Passion Through the Professoriate*, The 3rd Annual Michigan Alliance for Graduate Education and the Professoriate and King-Chavez-Park Future Faculty Fellows Conference , Michigan State University, East Lansing, MI,* October 8, 2011.

13. *The Development of New Electrochemical Probes: Three Dimensionally Macroporous Electrodes,* Gentex Corporation, Zeeland, MI, April 20, 2010.

12. *Chemistry Research Opportunities at Hope College*, URC: Oakton Community College, Des Plaines, IL January, 2010.

11. *Chemically Modified Electrodes: Determining Thin Film Thickness*, National Organization for the Professional Advancement of Black Chemist and Chemical Engineers," Atlanta, GA, March 30, 2010.

10. *Research Opportunities at Hope College: From Electrochemistry to Plant Physiology and Beyond*, Grand Rapids Community College, Grand Rapids, MI, September 7, 2008.

9. *Research Opportunities at Hope College: From Electrochemistry to Plant Physiology and Beyond,* Harold Washington College, Chicago, IL, October 12, 2007.
Two Day Course: Mercury, Hope Academy of Senior Professionals, Holland, Michigan, April 21 & 27, 2006.

8. *"Fungi, Alkaloids, and Differential Equations: A Multidisciplinary Undergraduate Program at Hope College*, Council on Undergraduate Research, Depauw University, Greencastle, IN, 2006.

7. *"Developing the Next Generation of Scientific Leaders Through a Dynamic Trio: Mentoring, Research and Education*, PEW Capstone Experiences Workshop, Chicago, IL, March 4, 2006.

6. *Cyclic Voltammetric Studies of Metal(II)-Tetraaminophthalocyanine Polymer Thin Films: Electrochemistry at Hope College*, Calvin College, December 2, 2004.

5. *Cyclic Voltammetric Studies of Metal(II)-Tetraaminophthalocyanine Polymer Thin Films: Electrochemistry at Hope College*, University of Illinois at Urbana, April 18, 2003.

4. *Amperometric Determination of Glucose by Electrodes Modified with Ferrocene and Tetraaminophthalocyanine*, University of Michigan, Michigan Space Grant Consortium: Seventh Annual Conference, Ann Arbor, MI, October 5, 2002.

3. *Voltammetric and Chronocoulometric Characterization of Electropolymerized Copper(II)-4, 9, 16, 23-Tetraaminophthalocyanine Thin Films,* 53rd Southwest Regional American Chemical Society Meeting, Tulsa, OK, October 2, 1997.

2. *Synthesis and Electropolymerization of Metal(II)-Tetraaminophthalocyanine*, Eighth Annual Graduate Student Research Symposium, Oklahoma State University, Stillwater, OK, March 17, 1997.

1. *Electropolymerization of Cu(II)-and Co(II)-4, 9, 16, 23-Tetraaminophthalocyanine: Potential Rate Modifiers in Chemiluminescence-Based Sensors*, 41st Annual American Chemical Society Pentasectional Meeting, Phillips Research Center, Bartlesville, OK, October 5, 1996.

Media Appearances and Interviews

"Green efforts being adopted by Burns Harbor," Detroit Public Television-Great Lakes Now. (October 19, 2021).

"Water Sampling Event June 5th," Regionally Speaking, "Morning Edition" with Chris Nolte. (May 24, 2021).
"Environmental Crisis in Northwest Indiana," Nuestra Comunidad NWI. (January 23, 2021).

Grants, Fellowships, and Awards (Funded: Internal: $36,100; External: $2,207,852)

Global Health Research Grant

March 2022-September 2022; $5,000

PI: *"Northern Lake County, Indiana: Environmental Contamination and Environmental Justice Issues*." Sponsored by Hope College Global Health Program

National Institutes of Health

(September 1, 2022 - August 31, 2027; $179,507.00.

PI: "*Northern Lake County Environmental Partnership*," **Pending.**

Acquisition of an Electrochemical Workstation

PI: Gentex Corporation. (2017), -$30,000

NSF-Phase I Centers for Chemical Innovation

Co-PI: *Center for Sustainable Ammonia Production with University of Michigan*; (2017-2021); $1,800,000; not funded.

National Science Foundation-Research Experience for Undergraduates

(2013-2016)-$275,000**.**

PI: *REU Site: Achieving the Next Level: Research Experiences for Underserved Populations.*

Hope College-Howard Hughes Medical Institute Faculty Development Grants for Research

(2013-2014)-$8,000.

Co-PI: *Biological and phytochemical investigations of Apios, a promising new root crop with great nutritional and medicinal value.*

Hope College-Howard Hughes Medical Institute Faculty Development Grants for Research

(2013-2014)-$15,000.

Co-PI: *Probing Interfaces: A Collaboration between Academics and Industry on Electrode Surfaces for Biomedical Devices.*

National Science Foundation-Collaborative Research at Undergraduate Institutions

(2011-2015)- $355,544.

Co-PI: *Mutualism Theory Using Endophytic Fungi and Their Host Grass*.

National Science Foundation-Research Experience for Undergraduates

(2009-2012)-$344,333.

PI: *REU Site: Professional Excellence and Development in Science Through Undergraduate Research.*

Jacob E. Nynehuis Faculty Development Grant

(2010-2011)-$8,100.

PI: *Development of Electrochemical Sensors Using Three-Dimensional Ordered Macroporous Electrodes and Disposable Electrodes.*

National Science Foundation-Research Site for Educators in Chemistry
(2006-2007)-$11,500.
PI: *Collaborative Research with a Hope College Research Team in the Development of Amperometric Sensors*.

National Science Foundation-Collaborative Research at Undergraduate Institutions
(2004-2008)-$816,773.
Co-PI: *A Multidisciplinary Test of Mutualistic Benefits Fungal Endophytes Provide Their Host Plants*.

National Science Foundation-Major Research Instrumentation
(2003-2005)-$719,035.
Co-PI: *Acquisition of a Nuclear Microprobe System for Interdisciplinary Research and the Integration of Research and Undergraduate Education at Hope College.*

NASA Michigan Space Grant
(2001-2002)-$5,000.
PI: *Carbon Dioxide and Glucose Sensing Based on Luminol Chemiluminescence and Electropolymerized Metal(II)-Tetraaminophthalocyanine*

NASA Graduate Fellowship, Oklahoma State University, (1995).

Dean of Natural Science and Applied Sciences Division Mentoring, Advising, and Teaching Award, (2010).

Global Shalom Fellow, Hope College, (2014).

A. Paul Schaap Fellow, Hope College, (Present-2014).

<u>Collaborations Since 1999 (*Current Collaborations):</u>
Professor Thomas Bultman (Hope College)
Professor Debbie Swarthout (Hope College)
*Professor Graham Peaslee (Notre Dame)
Professor Jianhua Li (Hope College)
Professor Greg Murray (Hope College)
*Professor Leah Chase (Hope College)
*Professor Elizabeth Sanford (Hope College)
Professor Thomas Neils (Grand Rapids Community College)
Gentex Corporation
Professor Phil Buhlman (University of Minnesota)
*Professor Ellen Wells (Purdue University)
*Professor Julie Peller (Valparaiso University)
*Professor Chris Iceman (Valparaiso University)
*Professor Jodi Allen (Purdue University-NW)
*Green Spaces, Brown Faces
*Professor Natalia Gonzalez-Pech (Hope College)
*Professor Anita Esquerra-Zwiers (Hope College)

Service to Hope College and the Department of Chemistry

- Admissions Representative for minority recruiting to Grand Rapids (2000).
- Admissions Representative for minority recruiting to Kalamazoo (2002).
- Delegate for Annual Sigma Xi National Meeting in Galveston, Texas (2002).
- Presentation at the Martin Luther King Jr. Celebration (2000, 2002, and 2003).
- Committee Member on Critical Issues Symposium: Brown vs. Board of Education (2004).
- Ad Hoc Committee member on the Permanent Arts Collection (2004).
- Coordinator for Science Day panel on interdisciplinary research and education (2004).
- President's Advisory Board Committee member (2004).
- Chemistry Club Faculty Advisor (2004-2005).
- Chemistry Department Seminar Coordinator (2004-2005).
- Chair of Sigma Xi Nominating Committee for the North Central Region (2004).
- PEW Representative for the Natural and Applied Sciences Division (2004-2007).
- Ad Hoc Committee Member on The Comprehensive Plan to Improve Minority Participation at Hope College (2004-2006).
- Interim Sigma Xi President, Hope College Chapter (2007-Present).
- Secretary of Hope College Chapter of Sigma Xi (2002-2003).
- Vice-President of Hope College Chapter of Sigma Xi (2003-2004).
- President of Hope College Chapter of Sigma Xi (2004-2007).
- Coordinator for Sigma Xi Student Research Awards (2004-Present).
- Committee member and secretary for the Global Task Force to review the mission statement of Hope College and general education requirements (2010).
- Coordinator for the *Hope 6* panel of faculty and students to discuss the *Jena 6* case (2008).
- Mentor for a student in Hope College's PROJECT TEACH initiative (2010).
- Committee member for HHMI; reviewed proposals for HHMI.
- Scholarship Committee Member for Barry M. Goldwater Scholarship (2010-2015).
- Klesis Mentor (2014-2016).
- Mediation Team for the Appeals and Grievances Committee (2011).
- Coordinator for the Undergraduate Research Collaborative for the City Colleges of Chicago (2007-2011).
- Honorary Degrees Committee (2014-2015).
- Participated in the Women of Color Celebration-Master of Ceremony (2013, 2015).
- Coordinator for Chemistry Department Summer Research (2008-2013, 2015).
- Coordinator for Grand Rapids Community College Visitation Day for summer research (2009-2014).
- American Chemistry Society Examinations Institute Committee Appointment for developing the Analytical Chemistry exam (2010- 2013).
- Chemistry Department Chair (2016-2018).
- Religious Life Committee (2018-Present).
- Chemistry Department Search Committee Chair (2018, 2016).

- Search Committee Member (seven search committee appointments: 2019-2016; Engineering, Chemistry x 3, Neuroscience, GES, and Assessment).
- Hope College Recruiting Senior Representative at the Southeastern Regional Education Board (2010-Present).
- Provost Search Committee Member (2021-2022).
- Cultural Intelligence Workshop Trainee (2021).

Service to the Holland Community

- Vice President of CORE City Christian Development Association (2003-2005).
- Science Director for Learning Enhancement Achievement Program (2003-2005).
- Presentation and Chemistry Demonstrations at Eagle Crest Charter Academy (2006).
- Volunteer and Visiting Minister and Chaplain at RestHaven Nursing Home (2003-2013).
- Outreach Coordinator for Harvestime Fellowship Church (2003-2008).
- Keynote Speaker for LEAP Fundraiser (2000).
- Keynote Speaker for Community Action House/EPIC Graduation (2015).
- Presentation and Chemistry Demonstrations at Juneteenth Celebration (2015).
- Presentation for Community Action House/EPIC group (2015).