

CURRICULUM VITAE

C. MICHAEL GREENLIEF

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Education:

B.S. in Chemistry with Honors, Emporia State University, Emporia, KS (1983)
Ph.D. in Chemistry, University of Texas at Austin (1987)
Postdoctoral Research Associate, IBM T. J. Watson Research Center (1987–1989)

Professional History:

Director, Charles W. Gehrke Proteomics Center, University of Missouri (2008–present; Co-Director 2001–2008)
Director, MU NMR Facility, University of Missouri (2007–present)
Director, Department of Chemistry Mass Spectrometry Facility, University of Missouri (1997–present)
Faculty member, Interdisciplinary Neuroscience Program, University of Missouri (2018 – present)
Office of Research Faculty Fellow, University of Missouri (2004–2008)
Associate Professor, Department of Chemistry, University of Missouri (1994–present)
Assistant Professor, Department of Chemistry, University of Missouri (1989–1994)
Postdoctoral Research Associate, International Business Machines (1987–1989)
Research Assistant, University of Texas at Austin (1983–1987)
Visiting Summer Researcher, Sandia National Laboratories (1986)
Teaching Assistant, University of Texas at Austin (1985)
Laboratory Assistant, Emporia State University (1979–1983)

Technical Specialties:

Biological mass spectrometry, quantitative proteomics, separation of complex mixtures, directed metabolite analysis

Membership in Professional Societies:

American Chemical Society
University of Missouri Local Section; Division of Analytical Chemistry; Division of Colloid and Surface Chemistry, Division of Physical Chemistry
American Society for Mass Spectrometry
Sigma Xi
Society for the Advancement of Chicanos and Native Americans in Science
Society for Neuroscience

Awards and Honors:

Fuldner Faculty Fellow, University of Missouri-Columbia (2020)
2016 E. Ann Nalley Midwest Award for Volunteer Service (American Chemical Society)

MU Teaching Development Leave (Fall 2003)
MU Faculty Research Leave (1998-99)
Big 12 Faculty Fellowship (1997)
MU–Provost’s Outstanding Junior Faculty Teaching Award (1994)
NSF–Young Investigator Award (1993)
IBM Research Division Award (1992)
Outstanding Recent Alumni Award, Emporia State University (1991)
Materials Research Society Graduate Student Award (1986)
American Vacuum Society National Student Scholarship (1986)
Robert A. Welch Pre-doctoral Fellowship (1986)
American Vacuum Society Scholarship Recipient, New Mexico Chapter (1985, 1986)
Outstanding Student in Analytical Chemistry, Emporia State University (1983)
Outstanding Senior Chemistry Major, Emporia State University (1982–1983)
Woodruff Scholar, Emporia State University (1979–1982)

Teaching Activities (Formal Courses – both old [prior to Fall, 2004] and new course numbers are referenced here):

*(*Courses which are no longer offered or in which the content has been altered significantly)*

Chem 1100 (Atoms and Molecules) – Winter 2005
Chem 12* (General Chemistry 2) – Winter 1993
Chem 1320 [Chem 32*] (First Semester General Chemistry) – Winter 1994; Fall 1994;
Winter 1995; Fall 2000; Winter 2001, Spring 2015
Chem 3200 [Chem 221*] (Quantitative Methods of Analysis) – Winter 2002; Fall 2004; Fall
2005; Fall 2011
Chem 223* (Quantitative Chemical Analysis) – Winter 1996; Fall 1997
Chem 231* (Physical Chemistry I) – Fall 1990
Chem 3330 [Chem 233*] (Physical Chemistry II) – Winter 1990; Winter 1991; Winter 1992;
Spring 2017
Chem 4340* [Chem 3340*, Chem 234*] (Physical Chemistry Laboratory) – Winter 2004;
Winter 2005; Winter 2006; Spring 2008; Spring 2009; Spring 2010; Spring 2011; Spring
2013; Spring 2014; Spring 2016; Spring 2018; Spring 2019; Spring 2020; Spring 2021
Chem 3700 [Chem 270*] (Undergraduate Seminar in Chemistry; writing intensive course) –
Winter 1997; Winter 1998; Winter 2000; Winter 2003; Winter 2007
Chem 300 (Problems in Chemistry) – Winter 1996; Fall 2002
Chem 301* (Topics in Chemistry: Computers for Chemists) – Fall 1991; Fall 1992
Chem 301* (Topics in Chemistry: Instrumental Analysis) – Fall 2001
Chem 4200 [Chem 312] (Instrumental Methods of Analysis) – Fall 2001; Fall 2002; Fall
2004; Fall 2009; Fall 2016, Fall 2017
Chem 331* (Intermediate Physical Chemistry I) – Fall 1990
Chem 333* (Intermediate Physical Chemistry II) – Winter 1990; Winter 1991; Winter 1992
Chem 401* (Topics: Surface Analysis and Characterization) – Fall 1993
Chem 401* (Topics: Mass Spectrometry) – Fall 1995; Fall 2001
Chem 430* (Advanced Physical Chemistry) – Fall 1999
Chem 7200 (Instrumental Methods of Analysis) – Fall 2004; Fall 2009; Fall 2016; Fall 2017
Chem 8087 (Seminar in Chemistry) – Spring 2018
Chem 8230 (Separations and Chromatography) – Fall 2021

Chem 8240 (Mass Spectrometry) – Fall 2015; Fall 2018; Fall 2020
Chem 8250 (Analytical Spectroscopy) – Fall 2007; Fall 2008; Fall 2010
Chem 8270 [Chem 425*] (Advanced Analytical Chemistry) – Fall 1991; Winter 2005; Fall 2006; Spring 2010; Fall 2012; Fall 2013; Fall 2014
Biol Eng 8370 (Materials Characterization Techniques) – Guest Lecturer, Fall 2014; Fall 2015; Fall 2016; Fall 2017; Fall 2108; Fall 2019

Teaching Activities (Informal Courses and Development of Materials):

Chem 2950 [Chem 150*] (Undergraduate Research) – Winter 1993; Fall 1993; Winter 1998; Fall 1998; Fall 2012; Spring 2013; Summer 2013; Fall 2013, Spring 2014; Fall 2014; Spring 2015; Summer 2016; Fall 2016; Spring 2017; Spring 2021
Chem 4950 [Chem 250*] (Senior Research in Chemistry) – Fall 1994; Winter 1995; Fall 1997; Winter 1998; Fall 2002; Winter 2003; Fall 2016; Spring 2017, Spring 2018
Chem 490 (Graduate Research in Chemistry) – 1990 through Summer 2004
Chem 8090 (Dissertation Research in Chemistry) – Fall 2004 to present
Chem 9090 (Post-Candidacy Dissertation Research) – Fall 2004 to present

Development and extensive revision of Physical Chemistry Laboratory – Fall 2003
Development of a new mass spectrometry experiment including building of the high vacuum system for Instrumental Methods of Analysis Laboratory – Spring 2010
Design, development, and construction of an all-metal, high vacuum system for the Knudsen Effusion experiment in Physical Chemistry Laboratory – Spring 2010
Computer interface and automation of Heats of Combustion experiment for Physical Chemistry Laboratory – Spring 2013
Redesign and construction of combined mass spectrometry/Knudsen effusion equipment for Instrumental Analysis and Physical Chemistry laboratory courses – Summer 2013
Design and development of a new gel electrophoresis lab for Instrumental Analysis – Fall 2016
Design and development of a new protein/peptide-based mass spectrometry experiment for Instrumental Methods of Analysis – Fall 2016
Design and development of a new solution calorimetry experiment for Physical Chemistry Laboratory – Spring 2018
Online Course Design Basics Workshop (Course completed Spring 2020)
Online Teaching Certification Seminar: Excellence in Online Teaching (Course completed Fall 2020)

Mentor for undergraduate students in the McNair Scholars and EXPRESS programs – 1991 to present
Mentor for Hanzhi Wu, visiting scholar from Hong Kong Baptist University, November 2012 – May 2013
Mentor for undergraduate students in the Arts and Science Discovery Fellows Program – 2015 – 2017
Mentor for undergraduates in the Arts and Science Undergraduate Research Mentorship Program – 2017

Dissertations and Theses directed:

D. A. Klug, MS (1992); W. Du, MS (1994); L. Chen, MS (1995); P. Prayongpan, MS (2001); D. Stripe, MS (2001); Y. Yuan, MS (2002); X. Li, MS (2004); H. Adusumilli, MS (2007); J. Liu, MS (2012); D. Ahire, MS. (2019)

L.A. Keeling, Ph.D. (1995); J. Chen, Ph.D. (1996); L.M. Nelen, Ph.D. (2000); J.R. Beck, Ph.D. (2001); S.W. Lee, Ph.D. (2001); N.D. Leigh, Ph.D. (2001); P. Prayongpan, Ph.D. (2004); L. Wan, Ph.D. (2007); Y. Li, Ph.D. (2015); J. Wang, Ph.D. (2016); M. Johnson, Ph.D. (2016); B. Yang, Ph.D. (2019); M.K. Appenteng (2021)

Current graduate students:

P. Bruner, Ph.D. (expected 8/2021); X. Wei, Ph.D. (expected 5/2022); X. Li, Ph.D. (expected 12/2021); N. Perera, Ph.D. (expected 5/2023); C. Ray, Ph.D. (expected 12/2023); K. Nyarko, Ph.D. (expected 12/2024); S. Mensah (expected 5/2025)

Service to the Department of Chemistry:

Undergraduate Committee (1989–1990)

Meetings with prospective chemistry majors and their parents (2001–present)

Graduate Recruiting Committee (1990–1994)

Author of Analytical Division Brochure (1992)

Author of Departmental Brochure (1992)

Various graduate student recruiting visits to other campuses (1989–present)

Graduate Committee (1994–1997, 2000–2007)

Long Range Planning Committee (1990–1992)

Faculty Advisor for the Chemistry Graduate Student Association (1990–2000)

Catalyst Society Committee (1992–1995)

Leaders/Development Committee (1996–2004)

L.B. Thomas Chemistry Scholar's Program Committee (1993–present, committee chair 1995)

Chair Advisory Committee (1994–1999)

Inorganic faculty search committee (1995)

Computing committee (1995–1999, 2009–present), committee chair (1998–1999); Faculty advisor for departmental website and departmental software management (2009–2021); development oversight of new departmental website (2014–2015); oversight of departmental website, including transition to Drupal 8 in 2021 with upgrades to the site (2015–present)

Fourth year review committee for Asst. Professor John Kauffman (1995)

Analytical faculty search committee, committee chair (1995–1996, 2001–2002)

Mass spectroscopist search committee, committee chair (1995–1996, 2003)

Houchins Professor search committee (1996–1997)

Promotion and tenure review committee for Asst. Professor Silvia Jurisson (1996)

Personnel Committee (1997–2000, 2007–2009, 2012–2015, 2017–2020), committee chair (1998–2000, 2008–2009, 2014–2015, 2019–2020)

Instrument Committee (1998–1999)

Director, Mass Spectrometry Facility (1997–present)

Third year tenure review committee for Asst. Professor Shon Pulley (1998)

Third year tenure review committee for Asst. Professor Donald Riederer (1999)
Third year tenure review committee for Asst. Professor Gary Baker (2014)
Third year tenure review committee for Asst. Professor Mark Lee, committee chair (2015)
Third year tenure review committee for Asst. Professor Sheila Baker (2019)
Promotion and tenure review committee for Asst. Professor Sheryl Tucker (2001)
Promotion and tenure review committee for Assoc. Professor Carol Deakyne, committee chair (2002)
Tenure review committee for Assoc. Professor John Brockman (2020)
Bioanalytical faculty search committee, committee chair (2001–2002, 2004–2005)
Faculty search committee, committee chair (2006–2007)
Webmaster for department website (2006–2007)
Faculty Responsibility Committee (2008)
Oversight of shared departmental research/teaching instrumentation (2008–2016, 2018–present)
Physical Chemistry faculty search committee, committee chair (2017-18)
Medicinal Chemistry faculty search committee (2018-19)

Service to the College of Arts and Science:

Faculty search committee in the Department of Physics and Astronomy (1991, 1999)
Chemistry department chair search committee (1993–1994)
Special Task Force on the AB degree in Computer Science (1995–1996)
Physical and Biological Sciences Cluster Review Panel (1995–1997), committee chair (1997)
Review Committee of the Chemistry Chair (1996–1997, 1999)
Ad Hoc Committee to recommend a candidate for the Herman Schlundt Distinguished Professorship in Chemistry (1998)
Division of Biological Sciences Faculty Search Committee (2009)
College Diversity and Inclusion Committee (2016–2021), Committee Chair (2018-2021)

Service to the University and the Columbia campus:

MU Research Reactor Evaluation Group on Neutron Reflectometry (1991–1992)
Scholars Day participant (1992)
University system review panel for the NSF Presidential Faculty Fellows Program, panel chair (1993)
Site Review Team at UMKC for the UM Research Board (1994)
Provost Committee for Teaching Awards (1995, 1996)
MU Research Council (1995–1998)
Selection Committee for Nominations to the Searle Scholars' Program (1995)
Chemical Engineering Faculty Search Committee (1996–1997)
Office of Research PRIME Fund Committee (2000–2004)
Office of Research *Ad Hoc* Review Committee for the NSF-MRI program (2000, 2001, 2011, 2017)
Director, Charles W. Gehrke Proteomics Center (2008–present, Co-Director 2001–2008);
The Center has over \$3.6M in instrumentation and an annual operating budget of ~\$420K/year.
Office of Research Faculty Fellow (2004–2008)
Review of MU Research Core Facilities Committee, committee chair (2005–2007)

Director of the Center for Arts and Humanities Search Committee (2005)
Graduate Program Review Committee member for the Mechanical and Aerospace Engineering Department (2006–2007)
Program Committee for the Missouri Nanoalliance Meeting at MU (2006)
Director, MU NMR Facility (2007–present) – The Facility has over \$3.8M in instrumentation and an annual operating budget of ~\$250K/year.
Hispanic and Latin American Faculty/Staff Association (1999–present), Historian (2003), Vice President (2004–2006), President (2007–2008), Faculty Representative (2009–2010)
MU Research Advisory Committee (2009–2013)
Judge, Spring 2010–2017 Undergraduate Research and Creative Achievements Forum
Faculty mentor, Mizzou Advance Program (2010)
Led workshop on NSF Broader Impacts for the MU Grant Writers Network (2010)
Mock review panel member for the Office of Research Grant Writing Institute (2011)
Office of Undergraduate Research program review committee (2013)
Organized and led a workshop on Metabolomics for MU Life Sciences Week (2013)
Life Sciences Undergraduate Research Opportunity Program Review Committee (2013–2017, 2019–2020)
Office of Research *Ad Hoc* Review Committee for the NSF-NRT program (2017–2019)
Organized and led a workshop on Proteomics for MU Life Sciences Week (2018)
Office of Research *Ad Hoc* Committee on Major Instrument Proposal Planning (2021)

Professional Service:

American Chemical Society

University of Missouri Local Section: Secretary/Treasurer (1992–93); Treasurer for the 1993 Midwest Regional Meeting; Local Section Representative to the Midwest Region Board (1997 – present); Program Chair for the 2003 Midwest Regional Meeting; General Chair for the 2014 Midwest Regional Meeting
Member of Midwest Region Board of Directors (1997–present): Board secretary 2006, 2011, 2016; Chair-elect 2007, 2012, 2017; Chair 2008, 2013, 2018; Awards Committee 2009–2015, 2017–2018
Member, National Committee on Minority Affairs (2020-2021)
Member, ACS Scholars Selection Committee (2020, 2021)
Reviewer, ACS Bridge Program (2020)
Advisor, American Chemical Society Student Affiliates (1993–1995)
Co-organized a symposium for the 2010 Midwest Regional Meeting of the American Chemical Society entitled “Converging of Experiment & Theory in Chemical Research”
Co-organized a symposium for the 1998 Midwest Regional Meeting of the American Chemical Society entitled “Surface Science: What can we learn from model systems?”
Co-organized and chaired a session on Surface Science at the 1997 Midwest Regional Meeting of the American Chemical Society
Co-organized and chaired a session on Surface Science at the 1996 Midwest Regional Meeting of the American Chemical Society

Session moderator for the Symposium on Surface and Colloid Chemistry of Advanced Materials at the 207th National Meeting of the American Chemical Society, San Diego, CA (1994)

Session Chair for the Molecular Processes at Surfaces Symposium at the National Meeting of the American Chemical Society (1991)

Session Chair for the Symposium on Silicon Hydride Chemistry and Silicon Chemical Vapor Deposition at the National Meeting of the American Chemical Society (1991)

Moderator for the Kendall Award Symposium I at the 199th National Meeting of the American Chemical Society, Boston, MA (1990)

American Society for Mass Spectrometry, member

Society for the Advancement of Chicanos and Native Americans in Science
Program Committee (2007-2020, Chair – Chemistry section 2009)

Society for Neuroscience, member

American Vacuum Society
Session Chair for the Surface Science Division at the 45th National Meeting of the American Vacuum Society for the session entitled “Photochemistry and Deposition.” (1998)

Nominated for the Executive Committee of the Surface Science Division (1998)

U.S. Army Materiel Command, Rapid Production System for High Affinity Reagents
Recognizing Protein Biomarkers – SBIR Phase I and Phase II review panel (2007)

National Science Foundation
National Science Foundation, review panelist (1991)
National Science Foundation, review panelist (2003)
National Science Foundation, review panelist (2007)
National Science Foundation, review panelist (2012–2017)
National Science Foundation, review panelist (2019-2020)
BIO Advisory Panel (2015, 2018, 2019)

National Institutes of Health
ZRG1 BCMB-D Mass Spectrometry Shared Instruments Study Section (2009)
Special Emphasis Panel/Scientific Review Group 2014/01 ZRG1 BCMB-D (30) I – Shared Instrumentation Program (2013)
Special Emphasis Panel/Scientific Review Group 2015/05 ZAT1 SM (35) P – Centers for Advancing Natural Products Innovation and Technology Program (2014)

National Defense Education Program, SMART Fellowship Program review panel (2010, 2011)

National Defense Science and Engineering Graduate Fellowship Program review panel (2012)

Educational Testing Service, Committee of Examiners for the GRE Subject Test in Chemistry (2010–2018), committee chair (2016–2018)

The First International Conference on Elderberry, Columbia, MO, Organizing and Editorial Committees (June 2013) under the auspices of the International Society for Horticultural Science. Associate editor for a special volume 1061 of *Acta Horticulturae* (2015) which contains peer-reviewed papers from the conference.

Manuscript Referee:
ACS Omega; ACS Chemical Neuroscience; Analyst; Antioxidants; Applied Physics Letters; Applied Surface Science; Arabian Journal of Chemistry; Chemical

Communications; Chemical Physics Letters; Chemical Reviews; Chemistry of Materials; Data in Brief; Food and Function; Food Chemistry; Food Research International; Food Science and Human Wellness; Forensic Sciences Research; International Journal of Food Science and Technology, International Journal of Molecular Sciences; Journal of the American Chemical Society; Journal of Applied Physics; Journal of Chemical Physics; Journal of the Electrochemical Society; Journal of Environmental Chemical Engineering; Journal of Food Process Engineering; Journal of Materials Chemistry; Journal of Medicinal Chemistry; Journal of Nanoscience and Nanotechnology; Journal of Neuroimmunology; Journal of Physical Chemistry; Journal of Physical Chemistry Letters; Journal of Physics and Chemistry of Solids; Journal of Vacuum Science and Technology; Langmuir; Life Sciences; Metabolites; Molecules; Neurotoxicity Research; Organometallics; Physical Chemistry Chemical Physics; Physical Review Letters; Plants; The Plant Journal; PLoS Biology; PLoS ONE; PLoS Neglected Tropical Diseases; Proteomics; Rapid Communications in Mass Spectrometry; Scientia Horticulturae; Scientific Reports; Surface and Interface Analysis; Surface Science; Thin Solid Films

Proposal Reviewer (external to the University):

U.S. Army Materiel Command; U.S. Civilian Research and Development Foundation; The Research Corporation; National Institutes of Health; National Science Foundation; Petroleum Research Fund; Kansas NSF EPSCoR Program; Australian Research Council; The British Council – Canada; The Wellcome Trust/DBT India Alliance

External manuscript reviewer for the U.S. Geological Survey (2012)

Guest Editor, *International Journal of Molecular Sciences*, Special Issue on “Biological Systems at the Protein Level” (2019)

Guest Editor, *Molecules*, Special Issue on “Mass Spectrometry-Based Methods for Determining the Bioactive Components from Dietary Botanical Supplements” (2021)

Guest Editor, *International Journal of Molecular Sciences*, Special Issue on “Biological Systems at the Protein Level 2.0” (2021)

Editorial Board, *International Journal of Molecular Sciences* (2019–present)

Editorial Board, *PLoS ONE* (2018–present)

Editorial Board, *Molecules* (2019–present)

Funding History:

University of Missouri–Columbia Research Council, Summer Research Fellowship, 1990

American Chemical Society-Petroleum Research Fund, Type G Grant, 1991–1993, \$18,000

National Science Foundation, “Surface Chemistry of Germanium Organometallics,” 1991–1994, \$224,500

National Science Foundation, Young Investigator Award Program, 1993–1998, \$312,500

University of Missouri Research Board, “Photon and Electron Induced Chemistry at the Gas/Semiconductor Interface, 1994–1995, \$44,700

National Science Foundation, “Development of an *In-Situ* Growth and Analysis Chamber for X-ray Scattering Experiments at the Advanced Photon Source,” Co-PI with Haskell Taub, Paul Miceli, and Edward Conrad (Georgia Institute of Technology), 1995–2001, \$287,300

Department of Energy, “Planning and Design of Beamlines at the Advanced Photon Source,” Co-PI with Haskell Taub and Paul Miceli at MU, in addition to 15 other scientists at 7 other mid-western universities (administered through Iowa State University), 1994–1995, \$187,000

- International Business Machines, Instrumentation Award, 1995, \$60,000
- Monsanto Company, Instrumentation Award, 1995, \$154,000
- Department of Energy, “Midwest Universities Collaborative Access Team (μ CAT) Beamlines on the Advanced Photon Source,” Co-PI with Haskell Taub and Paul Miceli at MU, in addition to 15 other scientists at 7 other mid-western universities, 1995–1998, \$2,800,000
- Visiting Industrial Scholar Program, Oak Ridge Associated Universities, 1997, \$600
- Big 12 Faculty Fellowship Program, 1997, \$2,500
- University of Missouri Research Board, “Upgrade of Chemistry Department Mass Spectrometry Facilities,” lead PI with Dmitri Zagorevski, 1997–1998, \$16,667
- Research Leave, University of Missouri-Columbia Research Council, “Cycloaddition Reactions at Semiconductor Interfaces–Research Leave Support,” 1998–1999, \$2,260
- Department of Energy, “Operation of the MUCAT Undulator Beamline at the Advanced Photon Source,” (administered through Iowa State University/Ames Laboratory) A. I. Goldman–lead PI, Co-PI with Haskell Taub and Paul Miceli at MU, in addition to 16 other scientists at 9 other universities, 1998–2000, \$450,000
- University of Missouri–Columbia Research Council, “Acquisition of a PC–based data system for a mass spectrometer,” 1999–2000, \$4,000
- Department of Energy, “Operation of the MUCAT Undulator Beamline at the Advanced Photon Source,” (administered through Iowa State University/Ames Laboratory) A. I. Goldman–lead PI, Co-PI with Haskell Taub and Paul Miceli at MU, in addition to 16 other scientists at 9 other universities, 2000–2002, \$460,000
- University of Missouri, “2000 Life Sciences Mission Enhancement Proposal: Proteomics,” Co-author, 2002–2005, \$1,567,000
- University of Missouri Research Board, “Mass Spectrometry of Reactive Intermediates,” lead-PI with Dmitri Zagorevski, 2001, \$20,500
- Monsanto Company, “Development of Proteomics Center and Plant Biology Research Projects,” Doug Randall and John Walker co-PIs, Stephen Alexander, Tom Quinn, and Mike Greenlief co-I, 2001–2008, \$5,000,000
- University of Missouri-Columbia/Monsanto Major Projects Grants, “Proteomics of Symbiotic Development,” Co-PI with Gary Stacy, David Emerich, Toni Kazic, and Jay Thelen, 2002–2004, \$236,603
- State of Missouri Life Sciences Trust Fund, “Development of Quantitative Proteomics-Building Missouri’s Research Capacity,” John Walker, Scott Peck, Jay Thelen, Brian Mooney, and Mike Greenlief were contributors to this part of the proposal. Marc Linit is the lead PI on the \$3.3M overall proposal, 2008–2010, the proteomics budget was ~ \$800,000
- National Institutes of Health - Dietary Supplement Research Centers: Botanicals (P50), “MU Center for Botanical Interaction Studies,” Dennis Lubahn, lead PI; co-I with 20 others, Greenlief was the Interactions Core scientific leader (Core budget was ~\$110K/year in direct costs), 2010–2016, \$7,567,253
- Battelle Energy Alliance, “A Research Program for Fission Product/Dust Transport and Adsorption/Desorption in HTGRs,” S. Loyalka, lead PI, co-I with 7 others, 2011–2015, \$1,157,367
- University of Missouri Research Board, “Surface Studies of Carbon Dioxide Reduction,” lead PI with T.R. Marrero co-I, 2012–2014, \$33,000
- Chancellor’s Excellence Fund. “Upgrading MU’s NMR Infrastructure,” M. Greenlief, J. Hazelbauer, and M. McIntosh, co-PIs, 2013-2014, \$750,000

- Mizzou Advantage, “Effect of Elderberry Juice on Cognition & Inflammation in Patients with Mild Cognitive Impairment,” David Beversdorf, lead PI, co-I with 5 others, (Proteomics budget: \$15,000), 2014–2018, \$50,000
- USDA – MDA Specialty Crop Block Grant, “Determining and Mitigating the Potential Occurrence of Cyanide in Elderberries,” Andrew Thomas and Michael Greenlief co-PIs, 2016–2018, \$29,775
- National Science Foundation, “MRI: Acquisition of a High-Resolution Mass Spectrometer/UPLC System,” C.M. Greenlief, lead PI with 4 other co-PIs, 2017–2019, \$476,424
- USDA – MDA Specialty Crop Block Grant, “Development of Elderberry Flowers as a Viable Specialty Crop,” Andrew Thomas and Michael Greenlief co-PIs, 2018 – 2020, \$22,460
- USDA – National Institute of Food and Agriculture, “Moving Elderberry into Mainstream Production and Processing,” Andrew Thomas, lead PI; Greenlief co-PI, Greenlief is the Food Science and Health scientific leader (budget ~\$235K/year in direct costs), 2021–2025, \$5,345,223.

Publications – current H-index: 33 (Google Scholar, June 2021)

97. Colleen L. Ray, James A. Gawenis, and C. Michael Greenlief, “A new method for olive oil authenticity screening using multivariate analysis of proton NMR spectra,” manuscript in preparation.
96. Grace Y. Sun, Xue Geng, Tao Teng, Bo Yang, Michael K. Appenteng, C. Michael Greenlief, and James C. Lee, “Dynamic role of phospholipases A2 in health and diseases in the central nervous system,” manuscript in preparation for *Cells*.
95. Shanyan Chen, Heather Siedhoff, Hua Zhang, Pei Liu, Ashley Balderrama, Runtong Li, Catherine Johnson, C. Michael Greenlief, Bastijn Koopmans, Timothy Hoffman, Jiankun Cui, Ralph G. DePalma, De-Pei Li, Zezong Gu, “Low-intensity blast induces acute glutamatergic hyperexcitability in mouse hippocampus leading to long-term learning deficits and altered expression of proteins involved in synaptic plasticity and serine protease inhibitors,” *Neurobiology of Disease* (submitted 08/2021).
94. Xing Wei, Renee D. JiJi, Anahita Zare, Bryan Lada, Xiyang Li and C. Michael Greenlief, “Deep-UV Resonance Raman Spectroscopy of Hydrated and Dehydrated Model α -Helical Transmembrane Peptides in Liposomes,” *Journal of Raman Spectroscopy* (revised 08/2021).
93. Colleen L. Ray, James A. Gawenis, and C. Michael Greenlief, “NMR internal standard shifts due to cyclodextrin inclusion complexes,” *Magnetic Resonance in Chemistry*, 1-6, (2021), doi.org/10.1002/mrc.5180.
92. Michael K. Appenteng, Ritter Krueger, Mitch C. Johnson, Harrison Ingold, Richard Bell, Andrew L. Thomas, and C. Michael Greenlief, “Cyanogenic glycoside analysis in American elderberry,” (invited article) *Molecules*, **26**, 1384 (2021), doi.org/10.3390/molecules26051384.

91. Grace Y. Sun, Michael K. Appenteng, Runting Li, Taeseon Woo, Bo Yang, Chao Qin, Meixia Pan, Magdalena Cieřlik, Jiankun Cui, Kevin L. Fritsche, Zezong Gu, Matthew Will, David Beversdorf, Agata Adamczyk, Xianlin Han, and C. Michael Greenlief, "Docosahexaenoic acid (DHA) supplementation alters phospholipid species and lipid peroxidation products in adult mouse brain, heart, and plasma," *NeuroMolecular Medicine*, **23**, 118-129, (2021), doi.org/10.1007/s12017-020-08616-0.
90. Bo Yang, Runting Li, Pei N. Liu, Xue Geng, Brian P. Mooney, Chen Chen, Jianlin Cheng, Kevin L. Fritsche, David Q. Beversdorf, James C. Lee, Grace Y. Sun and C. Michael Greenlief, "Quantitative proteomics reveals docosahexaenoic acid-mediated neuroprotective effects in lipopolysaccharide-stimulated microglial cells," *Journal of Proteome Research*, **19**, 2236-2246 (2020), doi.org/10.1021/acs.jproteome.9b00792.
89. Garrett Ungerer, Jiankun Cui, Tina Ndam, Mikeala Bekemeier, Hailong Song, Runting Li, Heather R. Siedhoff, Bo Yang, Michael K. Appenteng, C. Michael Greenlief, Dennis K. Miller, Grace Y. Sun, William R. Folk, and Zezong Gu, "*Harpagophytum procumbens* extract ameliorates allodynia and modulates oxidative and antioxidant stress pathways in a rat model of spinal cord injury," *NeuroMolecular Medicine*, **22**, 278-292 (2020), doi.org/10.1007/s12017-019-08585-z.
88. Hailong Song, Jiankun Cui, Valeri V. Mossine, C. Michael Greenlief, Kevin Fritsche, Grace Y. Sun, and Zezong Gu, "Bioactive components from garlic on brain resiliency against neuroinflammation and neurodegeneration (Review)," *Experimental and Therapeutic Medicine*, **19**, 1554-1559 (2020), doi.org/10.3892/etm.2019.8389.
87. Xue Geng, Bo Yang, Runting Li, Tao Teng, Mary Jo Ladu, Grace Y. Sun, C. Michael Greenlief, and James C. Lee, "Effects of Docosahexaenoic Acid and its Peroxidation Product on Amyloid- β Peptide-Stimulated Microglia," *Molecular Neurobiology*, **57**, 1085-1098 (2020), doi.org/10.1007/s12035-019-01805-4.
86. Danh C. Vu, Jihyun Park, Van K. Ho, Lloyd W. Sumner, Zhentian Lei, C. Michael Greenlief, Brian Mooney, Mark V. Coggeshall, and Chung-Ho Lin, "Identifying Health-promoting Bioactive Phenolics in Black Walnut Using a Cloud-based Metabolomics Platform," *Journal of Food Measurement and Characterization*, **14**, 770-777 (2020), doi.org/10.1007/s11694-019-00325-y.
85. Bo Yang, Kevin L. Fritsche, David Q. Beversdorf, Zezong Gu, James C. Lee, William R. Folk, C. Michael Greenlief, and Grace Y. Sun, "Yin-Yang mechanisms regulating lipid peroxidation of docosahexaenoic acid and arachidonic acid in the central nervous system," *Frontiers in Neurology*, **10**, 642 (2019), doi.org/10.3389/fneur.2019.00642.
84. Bo Yang, Andrew L. Thomas, and C. Michael Greenlief, "Comparative proteomic analysis unveils critical pathways underlying the role of nitrogen fertilizer treatment in American elderberry," *Proteomes*, **7**, 10 (2019), doi.org/10.3390/proteomes7010010.

83. Bo Yang, Runting Li, Taeseon Woo, Jimmy D. Browning, Jr., Hailong Song, Zezong Gu, Jiankun Cui, James C. Lee, Kevin L. Fritsche, David Q. Beversdorf, Grace Y. Sun and C. Michael Greenlief, "Maternal dietary docosahexaenoic acid alters lipid peroxidation products and (n-3)/(n-6) fatty acid balance in offspring mice," *Metabolites*, **9**, 40 (2019), doi.org/10.3390/metabo9030040.
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Selected Presentations (since 2016)

36. 2021 Neuroscience Meeting, Chicago, IL, November 2021, “Low-intensity blast exposure results in glutamatergic hyperexcitability and long-term learning behavior deficits in mice,” Heather Siedhoff, Shanyan Chen, Hua Zhang, Pei Liu, Ashley Balderrama, Runting Li, Catherine Johnson, C. Michael Greenlief, Bastijn Koopmans, Timothy Hoffman, Ralph G. DePalma, De-Pei Li, Jiankun Cui, Zezong Gu.
35. 2021 ASMS Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA, November 2021, “Region-resolved quantitative proteome profiling of an open-field blast-induced neurotrauma model in upright-positioned mice,” Marcus Jackson, Jiankun Cui, Shanyan Chen, Pei Liu, Ashley Balderrama, Catherine Johnson, C. Michael Greenlief, Ibolja Cernak, Ralph G. DePalma, Zezong Gu.
34. 55th Midwest Regional Meeting of the American Chemical Society, Springfield, MO, October 2021, “Influence of Soil Nitrogen Fertility on Fruit Characteristics of Cultivated American Elderberry Andrew L. Thomas, Patrick L. Byers, John D. Avery, Jr., Martin Kaps, Diann M. Thomas, Megan Westwood, Giselle Campos, C. Michael Greenlief, and Richard Biagioni.
33. Fall 2021 National Meeting of the American Chemical Society, Atlanta, GA, August 2021, “Determination of polyphenols in American elderberry pomace sample using HPLC-MS/MS,” Nihari Perera and C. Michael Greenlief.
32. Spring 2021 National Meeting of the American Chemical Society, April 2021, “Determination of nicotine in toenails as a biomarker for secondhand smoke by LC-MS,” Xiyang Li and C. Michael Greenlief.
31. Pittcon Conference and Expo, Chicago, IL, March 2020, “Adulteration detection and analysis with NMR and rapid UHPLC-MS,” James Gawenis, Colleen Ray, and C. Michael Greenlief.
30. 46th Annual Conference and K-12 STEM Week of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers, St. Louis, MO, November 2019, “Effects of dietary docosahexaenoic acid on lipid peroxidation products in adult male mice,” Michael K. Appenteng, Bo Yang, Runting Li, Taeseon Woo, Briana Kille, Kevin L. Fritsche, Jiankun Cui, Zezong Gu, Matthew Will, David Beversdorf, Grace Y. Sun, and C. Michael Greenlief.
29. 2019 Neuroscience Meeting, Chicago, IL, October 2019, “Effects of Docosahexaenoic Acid and its Peroxidation Product on Amyloid- β Peptide-Stimulated Microglia,” Xue Geng, Bo Yang, Runting Li, Tao Teng, Mary Jo Ladu, Grace Y. Sun, C. Michael Greenlief, James C. Lee.
28. 2019 Neuroscience Meeting, Chicago, IL, October 2019, “Anxiety and exploratory behaviors in heterozygous SERT knockout mice exposed to enriched vs. standard housing,” Briana. M Kille, Taeseon Woo, Ezra Solidum, Jiankun Cui, C. Michael Greenlief, Candice King, and David Q. Beversdorf.

27. 2019 Neuroscience Meeting, Chicago, IL, October 2019, “Quantitative proteomics reveals docosahexaenoic acid-mediated neuroprotective effects in lipopolysaccharide-stimulated microglial cells,” C. Michael Greenlief, Bo Yang, Runting Li, Xue Geng, Brian P. Mooney, Kevin L. Fritsche, David Q. Beversdorf, James C. Lee and Grace Y. Sun.
26. 2019 Neuroscience Meeting, Chicago, IL, October 2019, “Effects of dietary DHA on lipid peroxidation products in the brain and other body organs,” Michael K. Appenteng, Bo Yang, Runting Li, Taeseon Woo, Briana Kille, Kevin L. Fritsche, Jiankun Cui, Zezong Gu, Matthew Will, David Beversdorf, Grace Y. Sun, and C. Michael Greenlief.
25. 54th Midwest Regional Meeting of the American Chemical Society, Wichita, KS, October 2019, “Proteomics analysis reveals docosahexaenoic acid-mediated protective effects in lipopolysaccharide-stimulated microglial cells,” C. Michael Greenlief, Bo Yang, Runting Li, Xue Geng, James C. Lee, Brian P. Mooney, Kevin L. Fritsche, David Q. Beversdorf, and Grace Y. Sun.
24. 18th Human Proteome Organization World Congress, Adelaide, Australia, September 2019, “Quantitative proteomics reveals docosahexaenoic acid-mediated neuroprotective effects in lipopolysaccharide-stimulated microglial cells,” Bo Yang, Brian P. Mooney, Michael Greenlief, Runting Li, Xue Geng, Kevin L. Fritsche, David Q. Beversdorf, James C. Lee, and Grace Y. Sun.
23. 46th Apimondia International Apicultural Congress, Montreal, Canada, September 2019, “New technologies and business/university collaborations in the detection of honey fraud,” James Gawenis, Colleen Ray, C. Michael Greenlief, and Lara Gawenis.
22. 2019 Fall National Meeting of the American Chemical Society, San Diego, CA, August 2019, “Raman spectroscopy of H-bonding along TM α -helices with water,” Xing Wei, Renee D. JiJi, and C. Michael Greenlief.
21. 2019 ASMS Conference on Mass Spectrometry and Allied Topics, Atlanta, GA, June 2019, “Docosahexaenoic acid attenuates metabolic dysfunctions induced by lipopolysaccharide in BV-2 microglial cells,” Bo Yang, Runting Li, Brian P. Mooney, Kevin L. Fritsche, David Q. Beversdorf, Grace Y. Sun and C. Michael Greenlief.
20. 2019 ASMS Conference on Mass Spectrometry and Allied Topics, Atlanta, GA, June 2019, “Multiplex TMT based protein quantification on timsTOF Pro with parallel accumulation and serial fragmentation method,” Pei Liu, Brian Mooney, Michael Sussman, and Michael Greenlief.
19. 2019 ASMS Conference on Mass Spectrometry and Allied Topics, Atlanta, GA, June 2019, “User Experiences and Results from the tims-TOF Pro in a University Core Lab,” Bruker Breakfast Seminars, C. Michael Greenlief.
18. 2018 Neuroscience Meeting, San Diego, CA, November 2018, “Effects of docosahexaenoic acid and its peroxidation product on $A\beta$ -stimulated microglia,” Xue Geng, Bo Yang, Runting, Teng Tao, Grace Y. Sun, C. Michael Greenlief and James C. Lee.

17. 2018 Neuroscience Meeting, San Diego, CA, November 2018, “Effects of maternal docosahexaenoic acid (DHA) supplementation on lipid peroxidation products in offspring mouse,” Taeseon, Woo, Bo Yang, Runting Li, Kevin L. Fritsche, Grace Y. Sun, C. Michael Greenlief and David Q. Beversdorf.
16. 2018 Neuroscience Meeting, San Diego, CA, November 2018, “Quercetin enhances the protective effects of docosahexaenoic acid (DHA): Studies with activated BV-2 microglial cells,” Grace Y. Sun, Runting Li, Bo Yang, James C. Lee, Kevin L. Fritsche, David Q. Beversdorf, Zezong Gu, C. Michael Greenlief.
15. 53rd Midwest Regional Meeting of the American Chemical Society, Ames, IA, October 2018, “Cyanogenic glycoside analysis in American elderberry: Method development and validation,” M.K. Appenteng, R. Krueger, M.C. Johnson, A.L. Thomas, C. Greenlief.
14. 53rd Midwest Regional Meeting of the American Chemical Society, Ames, IA, October 2018, “Which is better frozen storage or heat drying?: Effect of storage method on the compounds in American elderberry (*sambucus nigra* subsp. *canadensis*),” P.H. Bruner, C. Greenlief, A.L. Thomas.
13. UMKC School of Pharmacy, “Unveiling anti-oxidative and anti-inflammatory effects of 4-hydroxyhexenal and 4-hydroxynonenal and their regulation by docosahexaenoic acid,” October 9, 2018, C. Michael Greenlief.
12. American Society for Neurochemistry 2018, Riverside, CA, March 2018, “Effects of maternal docosahexaenoic acid (DHA) supplementation on lipid peroxidation products in offspring mice,” Bo Yang, Runting Li, Hailong Song, Jimmy D. Browning, Kevin L. Fritsche, Zezong Gu, Jiankun Cui, David Q. Beversdorf, Grace Y. Sun, and C. Michael Greenlief.
11. 2017 Neuroscience Meeting, Washington, DC, November 2017, “Anti-oxidative effects of docosahexaenoic acid and its peroxidation products in microglia,” Grace Y. Sun, Runting Li, Bo Yang, C. Michael Greenlief, Kevin L. Fritsche, Jiankun Cui, and David Q. Beversdorf.
10. 44th Annual Conference and K-12 STEM Week of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers, November 2017, Minneapolis, MN, “Cyanogenic Glycosides Analysis in American Elderberry: Picrate Paper and LC MS/MS Method Development and Validation,” Michael K. Appenteng, Mitch C. Johnson, Ritter Krueger, Harrison Ingold, Richard Bell, Andrew Thomas, and C. Michael Greenlief.
9. Neurochemical Conference 2017: Advances in molecular and epigenetic mechanisms in neurodegeneration and neuroinflammation: novel therapeutic approaches, Warsaw, Poland, October 2017, “Docosahexaenoic acid (DHA) and its peroxidation products in microglia,” Grace Y. Sun, Runting Li, Bo Yang, Jiankun Cui, Zezong Gu, C. Michael Greenlief, Kevin L. Fritsche, and David Q. Beversdorf.

8. 52nd Midwest Regional Meeting of the American Chemical Society, Lawrence, KS, October 2017, “Cyanogenic glycosides analysis in American elderberry: picrate paper and LC MS/MS method development and validation,” Michael K. Appenteng, Mitch C. Johnson, Ritter Krueger, Harrison Ingold, Richard Bell, Andrew Thomas, and C. Michael Greenlief.
7. 52nd Midwest Regional Meeting of the American Chemical Society, Lawrence, KS, October 2017, “Untargeted identification of polyphenol secondary metabolites in *Sambucus nigra* (subsp. *canadensis*) flower extracts,” Paul H. Bruner, Michael A. Rotondi, Andrew L. Thomas, and C. Michael Greenlief.
6. 52nd Midwest Regional Meeting of the American Chemical Society, Lawrence, KS, October 2017, “Identification of individual phenolic metabolites in American elderberry pomace extract utilizing high performance liquid chromatography tandem mass spectrometry,” Ritter Krueger, Andrew L. Thomas, and C. Michael Greenlief.
5. Drury University, Springfield, MO, November 2016, “Using Mass Spectrometry to Understand Botanicals,” C. Michael Greenlief.
4. 51st Midwest Regional Meeting of the American Chemical Society, Manhattan, KS, October 2016, “Cyanogenic glycosides analysis in elderberry: picrate paper method and LC MS/MS method development and optimization,” Michael K. Appenteng, Mitch C. Johnson, Richard Bell, Andrew Thomas, and C. Michael Greenlief.
3. 51st Midwest Regional Meeting of the American Chemical Society, Manhattan, KS, October 2016, “Method development and validation for quantitation of FruArg in mice plasma and brain tissue using UPLC-MS/MS,” Mitch C. Johnson, Hailong Song, Jiankun, Valeri Mossine, Zezong Gu, and C. Michael Greenlief.
2. 51st Midwest Regional Meeting of the American Chemical Society, Manhattan, KS, October 2016, “Investigating the differentially expressed proteome in *Sambucus nigra* subsp. *canadensis*,” Bo Yang, Andrew L. Thomas, and C. Michael Greenlief.
1. International Mass Spectrometry Conference, Toronto, Canada, August 2016, “Method Development and Validation for the Quantitation of N- α -(1-deoxy-D-fructos-1-yl)-L-arginine (FruArg) using LC-MS/MS,” Mitch C. Johnson, Hailong Song, Jiankun Cui, Valeri Mossine, Zezong Gu, C. Michael Greenlief.