

Gregory B. Dudley, Ph.D.

111 East Broad Street #535, Falls Church, VA 22046 || 850-294-7302
gregbdudley@gmail.com || gregory.dudley@mail.wvu.edu || gdudley@nsf.gov

Professional Appointments

National Science Foundation, Alexandria, VA

- Program Director, NSF Division of Chemistry 08/2024–present
Chemical Mechanism, Function, and Properties (CMFP) Program
Chemical Catalysis (CAT) Program

West Virginia University, Morgantown, WV

- Eberly Family Distinguished Professor of Chemistry 07/2016–present
- Chair, C. Eugene Bennett Department of Chemistry 07/2016–06/2024

Florida State University, Tallahassee, FL

- Professor of Chemistry and Biochemistry 08/2015–07/2016
- Associate Department Chair 08/2012–07/2016
- Associate Professor of Organic Chemistry 08/2008–07/2015
Raymond Cottrell Family Professor 08/2008–07/2012
- Assistant Professor of Organic Chemistry 08/2002–07/2008

Florida A&M University, Tallahassee, FL

- Graduate Faculty of Pharmacy and Pharmaceutical Sciences 01/2016–07/2016

University of Ottawa, Canada

- Visiting Professor of Organic Chemistry 05/2011

Education

Massachusetts Institute of Technology, Cambridge, MA

- Ph.D. in Organic Chemistry 09/1995–08/2000
- *Research Advisor*: Professor Rick L. Danheiser
- Thesis: *A Total Synthesis of (-)-Ascochlorin*

Florida State University, Tallahassee, FL

- B.A. degree in Chemistry, with Honors - *magna cum laude* 08/1991–05/1995
- *Research Advisor*: Professor Martin A. Schwartz

Professional Development

University of California at Berkeley, CA

- Executive Leadership Academy 07/2024
- Center for Studies in Higher Education
- Goldman School of Public Policy

American Chemical Society, Washington D.C.

- Academic Leadership Training 02/2017
- Cottrell Scholars Collaborative

Sloan-Kettering Institute for Cancer Research, New York, NY

- NIH Postdoctoral Fellow 10/2000–05/2002
- Molecular Pharmacology and Chemistry Program
- *Advisor*: Professor Samuel J. Danishefsky
- Research Topic: *Total Synthesis of Guanacastepene A*

University of Kansas, Lawrence, KS

- NSF Research Experience for Undergraduates (REU) Program 06/1994–08/1994
- *Research Advisor*: Professor Richard S. Givens

Selected Honors and Awards

- Eberly Family Distinguished Professorship, West Virginia University, 2016–present
- *Brown & Williamson* Lecturer, University of Louisville, 2023
- Brodie Research Innovation Award, 2019–2020
- *Syngenta* Lecturer, Groupe D'Etudes de Chemie Organique 57, Ascain, France, 2016
- *Organic Syntheses* Lecturer, University of New Hampshire, 2012
- Raymond Cottrell Family Professor, 2008–2012
- Highlighted in Florida Trend Magazine, “Person to Watch”, 2010
- FSU Developing Scholar Award, 2010
- FSU Undergraduate Teaching Award, 2010
- FSU Innovator Award, 2006, 2007, 2008, 2010, 2012
- Featured in Tallahassee Magazine, “The New Establishment”, 2006
- NIH Postdoctoral Fellowship, 2000–2002
- Bristol-Myers Squibb Predoctoral Fellowship, 1999–2000
- Roche Award for Excellence in Organic Chemistry, 1999
- Boehringer Ingelheim Predoctoral Fellowship, 1997–1998
- MIT Chemistry Outreach Fellowship, 1997

Selected Professional Activities

- Program Director, NSF Division of Chemistry, 2024–present
Responsibilities include leadership and direction in the Chemical Mechanism, Function, and Properties (CMFP) and Catalysis (CAT) programs. Program Directors oversee the NSF merit review process, interact with research principal investigators (PIs), form and facilitate merit review panels, recommend funding decisions, and suggest new funding opportunities.
- Science policy contributor, consultant, and expert witness, 2012–present
Public sector work toward better science-based policies and practices. Consulted on >100 Federal drug cases and testified >40 times related to the regulatory challenges of emerging designer drugs; helped author a public [letter](#) from concerned scientists about fentanyl-related substances; helped draft an *Amicus* [brief](#) for the US Supreme Court in the case of *McFadden v. US*; worked with a non-profit organization and White House counsel on a clemency case; and provided policy recommendations and [testimony](#) for the US Sentencing Commission ([twice](#)), including policies now encoded in the US Sentencing Guidelines.
- Department Chair: Bennett Department of Chemistry, 2016–2024
Responsible for management and leadership direction of the chemistry department in keeping with the mission and vision of WVU. Responsibilities include leading shared governance and strategic planning, personnel, recruiting and retention, curriculum and program development, research and scholarship, facilities, budget and fiscal management, fundraising, etc.
- Eberly Edge working group: Promoting Liberal Arts Education, 2023

Part of a small working group assembled within the Eberly College to advocate for better recognition of the value of the liberal arts in promoting critical thinking, problem-solving, communication, and resiliency for long-term personal and professional success, and to help define and develop “Eberly Edge”, a common vision and core curriculum for the College.

- Eberly College Social Justice Think Tank, Founding Member, 2020–2022
One of the founding members of the Social Justice Think Tank, helping chart a course for the Eberly College in the broad and inclusive area of social justice. The focus of my two-year term was on faculty evaluations: helping create policy to ensure that contributions related to social justice, equity and inclusion, and public engagement are recognized and rewarded.
- WVU Academic Innovation Summit, Facilitator, 2021
Trained facilitator in a Provost Office initiative, coordinated through the WVU Research Office, working with multidisciplinary teams from across campus on specific challenges facing rural Appalachia. Facilitated a team focused on innovations to create a more engaged university; team’s pitch for a Community Engagement Collaborative program was [funded](#).
- WVU Inclusive Hiring Initiative, Facilitator, 2020–2022
Trained facilitator in a Provost Office initiative, coordinated through the WVU ADVANCE Center, to promote equitable and inclusive hiring practices that lead to better representational diversity and a stronger faculty.
- WVU ADVANCE Center, Change Agent Course 2020–2021
Course for academics interested in equity-promoting transformative action within their units and the larger institution. In-person course interrupted by the 2020 pandemic; continued and completed on-line in 2021.
- ACS DOC Executive Committee, Member-at-Large, 2019–2021
Served on the Executive Committee for the American Chemical Society Division of Organic Chemistry, with duties including strategic planning and coordination of ACS DOC activities; selected by national election of ACS DOC members.
- Conference Organizer: Enabling Technology for Reactions and Processes, 2015–2017
Initiated and coordinated an annual workshop for synthetic and physical organic chemists on modern tools and methods for chemical synthesis. This workshop was part of the Telluride Science Research Center (TSRC) summer conference series in Telluride, CO.
- Associate Chair: FSU Chemistry and Biochemistry Department Curriculum, 2012–2016
Responsible for curriculum design, teaching assignments, instructor supervision, course creation and approval, and other duties.
- Faculty Advisor: FSU Chemistry Outreach, 2004–2013
Initiated and served as faculty mentor for a program in which graduate students visit area high schools, interact with students in the chemistry classes, and perform demonstrations
- Faculty Advisor: FSU Alpha Phi Omega, 2007–2013
Served as faculty advisor and mentor for the FSU chapter of Alpha Phi Omega (AΦΩ), the national undergraduate service fraternity
- Faculty Advisor: FSU ChemPreneurs pilot program, 2009
Led a ChemPreneur team, comprising a chemistry graduate student and a business school entrepreneur student, in the development of a business plan based on chemical technology

Classroom Teaching

West Virginia University

- Instructor: Introduction to Chemistry, CHEM 110
Course Description: preparatory chemistry course for aspiring science majors (2021)
- Instructor: Advanced Organic Chemistry 2, CHEM 532
Course Description: graduate course focused on organic synthesis (2022, 2023)

Florida State University

- Instructor: General Chemistry I, CHM 1045C

- Course Description: introductory chemistry course for science majors (2004–2005, 2007)
- Instructor: Survey of Organic Chemistry, CHM 2200
Course Description: one-semester organic chemistry for allied health majors (2011–2013)
- Instructor: Organic Chemistry I, CHM 2210
Course Description: introductory undergraduate organic chemistry course (2010, 2015x2)
- Instructor: Organic Chemistry II, CHM 2211
Course Description: second-semester undergraduate organic chemistry course (2009)
- Instructor: Honors Organic Chemistry I, CHM 2210
Course Description: undergraduate organic chemistry course for honors students (2007–2008)
- Instructor: Honors Organic Chemistry II, CHM 2211
Course Description: undergraduate organic chemistry course for honors students (2008–2009)
- Instructor: Advanced Organic Chemistry — Reactions, CHM 5226
Course Description: graduate course on important organic methodology (2002–2006, 2011)
- Instructor: Synthetic Organic Chemistry, CHM 5250
Course Description: graduate course on organic reactions and synthesis (2014x2)
- Instructor: Chemical Reactivity — Bioorthogonal Chemistry, CHM 5555
Course Description: graduate course on a cutting-edge topic in the chemical sciences (2012)

University of Ottawa

- Instructor: Advanced Topics in Organic Chemistry: Alkynes, CHM 8304J (2011)
Course Description: graduate course on modern alkyne chemistry (2011)

Research Associates

Postdoctoral scholars

Dr. Samantha Ottavia PhD 2023, UNC Chapel Hill (Aube lab)

Graduate Students

Kh Tanvir Ahmed 4th year student from Duquesne University, PA
Nathan Selvaraj 3rd year student from West Virginia University

Undergraduate Students

Jada Berg Research Assistant

Previous Group Members

Former postdoctoral associates:

Dr. Michael P. Frasso, 08/2018–05/2020	Ron R. Ramsubhag, Ph.D. 2017
Dr. Paratchata “Tae” Batsomboon, 06/2017–12/2019	Alec Morrison, Ph.D. 2017
Prof. Gaspar Diaz Muñoz, 01/2012–01/2013	Paratchata “Tae” Batsomboon, Ph.D. 2016
Dr. Jumreang Tummatorn, 12/2009–06/2011	Tung Hoang, Ph.D. 2015
Dr. Philip A. Albiniaak, 08/2006 – 02/2009	Rimantas Slegieris, Ph.D. 2015
Dr. Jeannie H. Jeong, 08/2007 – 12/2008	Michael R. Rosana, Ph.D. 2014
Dr. Sreenivas Katukojvala, 08/2005–07/2006	Marilda P. Lisboa, Ph.D. 2013
Dr. Kevin Wing C. Poon, 01/2004 – 06/2006	Jingyue Yang, Ph.D. 2011
Dr. Shin Kamijo, 01/2004 – 03/2006	Sami F. Tlais, Ph.D. 2011
Dr. Timothy F. Briggs, 10/2003 – 10/2005	David M. Jones, Ph.D. 2009
Dr. Hubert T.-C. Lam, 01/2003 – 09/2005	Douglas A. Engel, Ph.D. 2009
	Mariya V. Kozyska, Ph.D. 2008
	Susana S. Lopez, M.S. 2009
	Daniella M. Barker, M.S. 2009
	Dena R. Hodges, M.S. 2008
	Ernest O. Nwoye, M.S. 2008
	Samuel G. Salamone, M.S. 2005

Former graduate students:

Amir Tavakoli, PhD 2023
Bobby Gaston, Ph.D. 2023
Alexa C. Martin, Ph.D. 2022
Harvey F. Fulo, Ph.D. 2021

Selected former undergraduate students:

Marisa Organiscak, B.S. 2023
Alex Ziegelmeier, B.S. 2020
Chelsea Massaro, B.S. Honors 2016
Apiwat Wangweerawong, B.S. Honors 2011
Cecelia C. O'Leary, B.S. Honors 2010
Sarah E. House, B.S. Honors 2005
James D. Sunderhaus, B.S. Honors 2003
Andrew Janeczek, B.S. 2016
Christina Dadich, B.S. 2015
Taylor Southworth, B.S. 2013
Colleen Keohane, B.S. 2013
Rojay Gordon, B.S. 2013
Janet Simon, B.S. 2012
Claudia R. Avalos, B.S. 2010
Shawn M. Amisial, B.S. 2007
Jeananne A. Singletary, B.S. 2004

RAP/CHM 1051L (honors first-year) students:
Margaret E. Matthews (2007), Joseph P. Hernandez (2007), Alyson W. West (2008), Edward F. Kuester (2008), James Hoang (2013), Jillian Jones (2013), Samantha

Shornack (2021-2022), Marisa Organiscak (2021-2023), Kayla Baselj (2022-2023), Jada Berg (2022-2023)

Visiting, exchange, and REU students:
Victoria Iacobucci (NIDA intern 2023), Cameron Jacobsen (REU 2023), Jacqueline Pinkerton (REU 2022), Caitlin Thebeault (REU 2021), Chuthamat Duangkamol (RGJ Scholar, 2018-2019), Maria Vidaca (REU 2018), Morgan Vincent (REU 2018), Perez Youmbi (REU 2017), Mélodie Birepinte (2016), Suzan Al-Anwar (2015), Vincent Vedovato (2014), Andrew Royappa (2013), Vitchaphol "Ton" Motaneeyachart (2012), Sanpitcha "Jae" Siangsuebchart (2012), Cristiano Leandro (2012), Teng-wei Wang (2011), Tanit Intaranukulkit (2011), Thitiya "Whan" Patarakosol (2009), Viriya "Joy" Boonmuang (2009), Jumreang Tummatorn (RGJ Scholar, 2007-2008), Maureen K. Reilly (2006)

Student Dissertations and Theses (with type and title)

17. Amir Tavakoli (PhD 2023) "*Enabling technologies for chemical synthesis: I. Selective microwave heating; II. Synthesis and regioselective cyclotrimerizations of tethered 1,6-diynes*"
16. Robert Gaston, Jr (PhD, 2023) "*Synthesis and Pharmacology of Illudalic Acid and Analogous Chemical Structures*"
15. Alexa C. Martin (PhD, 2022) "*Synthesis and Cyclotrimerization of Sulfonyl Enynes.*"
14. Harvey F. Fulo (PhD, 2021) "*Enabling Technologies for Medicinal Chemistry and Synthesis: I. Cannabinoids; II. Illudalic Acid; III. Microwave Chemistry.*"
13. Nicholas Kramer (PhD, 2017) "*Reaction discovery using neopentylene-tethered coupling partners: methodology and applications of dienyne cycloisomerizations.*"
12. Ron Ramsubhag (PhD, 2017) "*Applications of alkynogenic fragmentation products derived from vinylogous acyl triflates.*"
11. Alec Morrison (PhD, 2017) "*Thermal cycloisomerizations of 1,6-enynes for the synthesis of illudinine and other high-value polycyclic aromatic structures.*"
10. Paratchata "Tae" Batsomboon (PhD, 2016) "*Part I: Fragmentation reactions generating acyclic and cyclic alkynes. Part II: A second-generation formal synthesis of palmerolide A.*"
9. Tung Hoang (PhD, 2015) "*Tandem processes involving an alkynogenic fragmentation and applications in sesquiterpene syntheses*"
8. Rimantas Slegieris (PhD, 2015) "*Process improvements in the total chemical synthesis of progesterone, and other synthetic studies*"
7. Michael R. Rosana (PhD, 2014) "*Selective heating of polar solutes in a homogeneous solution: evidence of microwave-specific effects and a method to quantify these effects*"
6. Marilda P. Lisboa (PhD, 2013) "*Formal synthesis of palmerolide A using fragmentation methodology*"
5. Jingyue Yang (PhD, 2011) "*Anionic rearrangement of 2-benzyloxy pyridine derivatives and a synthetic approach to aldingenin B*"

4. Sami F. Tlais (PhD, 2011) “*I. para-Siletanylbenzyl (PSB) protecting group II. Stereocontrol of 5,5-spiroketals in the synthesis of cephalosporolides H, E, and F*”
 3. David M. Jones (PhD, 2009) “*Addition / C–C bond cleavage reactions of vinylogous acyl triflates and their application to natural products synthesis*”
 2. Douglas A. Engel (PhD, 2009) “*Organic synthesis and methodology related to the malaria drug artemisinin*”
 1. Mariya V. Kozytska (PhD, 2008) “*I. Siletanylmethylithium, an ambiphilic siletane. II. Synthetic approach to basiliolide B*”
- Kristen Nerbecki (MS, 2022) “*Tandem Addition/Fragmentation Reactions of Vinylogous Acyl Sulfonates*”
 - Susana S. Lopez (MS, 2009) “*Methodology for the olefination of aldehydes and ketones via the Meyer-Schuster reaction*”
 - Samuel G. Salamone (MS, 2005) “*A ring expansion approach to roseophilin*”
 - Chelsea Massaro (BS, Honors 2016) “*gem-Dimethylcyclopentane-fused pharmacophores*”
 - Apiwat Wangweerawong (BS, Honors 2011) “*Scope of a novel [1,2]-anionic rearrangement of 2-benzyloxypyridine derivatives*”
 - Cecelia C. O’Leary (BS, Honors 2010) “*A novel protocol for the synthesis of aryl Grignard reagents at low heat*”
 - Sarah E. House (BS, Honors 2005) “*para-Siletanylbenzyl: a novel hydroxyl protecting group*”

Publications

Dudley Lab Original Research Publications: (undergraduate co-authors underlined)

- Tavakoli, A.; Selvaraj, N. J.; Dudley, G. B. Synthesis of 4,4-Dimethyl-1,6-Heptadiyne and Derivatives from Dimedone. *manuscript submitted*.
- (100) Tavakoli, A.; Dudley, G. B. Regioselective [2+2+2] Alkyne Cyclotrimerizations to Hexasubstituted Benzenes: Syntheses of Fomajorin D and Fomajorin S. *J. Org. Chem.* **2024**, *89*, 6847–6852.
DOI: 10.1021/acs.joc.4c00224
<https://pubs.acs.org/doi/10.1021/acs.joc.4c00224>
- (99) Hansen, D. T.; Rueb, N. J.; Levinzon, N. D.; Cheatham, III, T. E.; Gaston, Jr., R.; Ahmed, K. T.; Osburn-Staker, S.; Cox, J. E. Dudley, G. B.; Barrios, A. M. The Mechanism of Covalent Inhibition of LAR Phosphatase by Illudalic Acid. *Bioorg. Med. Chem. Lett.* **2024**, *104*, 129740.
DOI: 10.1016/j.bmcl.2024.129740
<https://www.sciencedirect.com/science/article/pii/S0960894X24001422>
- (98) Ahmed, K. T.; Martin, A. C.; Wabler, G. O.; Nerbecki, K. S.; Dudley, G. B. Tandem Fragmentation / Olefination for Production of Neopentylene-Tethered 1,6-Enynes from Dimedone. *Org. Synth.* **2024**, *101*, 124–149.
DOI: 10.15227/orgsyn.101.0124
<https://www.orgsyn.org/demo.aspx?prep=v101p0124>
- (97) Wang, H.; Gaston, R., Jr.; Ahmed, K. T.; Dudley, G. B.; Barrios, A. M. Derivatives of the fungal natural product illudalic acid inhibit the activity of protein histidine phosphatase PHPT1. *ChemMedChem* **2023**, *18*, e202300187.
DOI: 10.1002/cmdc.202300187
<https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/cmdc.202300187>
Highlighted in [ChemistryViews.org](https://www.chemistryviews.org) as a Very Important Paper (VIP)

- <https://www.chemistryviews.org/new-inhibitors-based-on-illudalic-acid/>
cover: <https://chemistry-europe.onlinelibrary.wiley.com/doi/full/10.1002/cmdc.202300388>
- (96) Tavakoli, A.; Dudley, G. B. Synthesis of coprinol and several alcyopterosin sesquiterpenes by regioselective [2 + 2 + 2] alkyne cyclotrimerization. *J. Org. Chem.* **2022**, *87*, 14909–14914.
DOI: 10.1021/acs.joc.2c01741
<https://pubs.acs.org/doi/full/10.1021/acs.joc.2c01741>
Org. Chem. Highlights: <https://www.organic-chemistry.org/Highlights/2023/12June.shtm>
- (95) Tavakoli, A.; Dudley, G. B. Synthesis of 4,4-dimethyl-1,6-heptadiyne and other neopentylene-tethered (NPT) 1,6-diynes. *J. Org. Chem.* **2022**, *87*, 5775–5784.
DOI: 10.1021/acs.joc.2c00110
<https://pubs.acs.org/doi/full/10.1021/acs.joc.2c00110>
- (94) Blake, M. R.; Gardner, R. T.; Jin, H.; Staffenson, M.; Rueb, N. J.; Barrios, A. M.; Dudley, G. B.; Cohen, M. S.; Habecker, B. A. Small molecules targeting PTP σ —Trk interactions promote sympathetic nerve regeneration. *ACS Chem. Neurosci.* **2022**, *13*, 688–699.
DOI: 10.1021/acschemneuro.1c00854
<https://pubs.acs.org/doi/full/10.1021/acschemneuro.1c00854>
- (93) Tavakoli, A.; Stiegman, A. E.; Dudley, G. B. Mixed solvent system for selective microwave heating: accelerated thermal reaction kinetics of a microwave-transparent substrate. *Phys. Chem. Chem. Phys.* **2022**, *24*, 2794–2799. (PCCP HOT Article)
DOI: 10.1039/D1CP04883J
<https://pubs.rsc.org/en/content/articlelanding/2022/CP/D1CP04883J>
- (92) Fulo, H. F.; Rueb, N. J.; Gaston, R., Jr.; Batsomboon, P.; Ahmed, K. T.; Barrios, A. M.; Dudley, G. B. Synthesis of illudalic acid and analogous phosphatase inhibitors. *Org. Biomol. Chem.* **2021**, *19*, 10596–10600.
DOI: 10.1039/d1ob02106k
<https://pubs.rsc.org/en/content/articlelanding/2021/ob/d1ob02106k>
- (91) Zhang, L.; Jin, T.; Guo, Y.; Martin, A. C.; Sun, K.; Dudley, G. B.; Yang, J. Synthesis of gem-dimethylcyclopentane-fused arenes with various topologies via TBD-mediated dehydro-Diels-Alder reaction. *J. Org. Chem.* **2021**, *86*, 16716–16724.
DOI: 10.1021/acs.joc.1c01957
<https://pubs.acs.org/doi/abs/10.1021/acs.joc.1c01957>
- (90) Martin, A. C.; Rogers, J. A.; Batsomboon, P.; Morrison, A. E.; Ramsubhag, R.; Popp, B. V.; Dudley, G. B. Benzannulation and hydrocarboxylation methods for the synthesis of a neopentylene-fused analogue of ibuprofen. *ACS Omega* **2021**, *6*, 30108–30114.
DOI: 10.1021/acsomega.1c04943
<https://pubs.acs.org/doi/10.1021/acsomega.1c04943>
- (89) Fulo, H. F.; Shoeib, A.; Cabanlong, C. V.; Williams, A. H.; Zhan, C.-G.; Prather, P. L.; Dudley, G. B. Synthesis, molecular pharmacology, and structure-activity relationships of 3-(indanoyl)indoles as selective cannabinoid type 2 receptor antagonists. *J. Med. Chem.* **2021**, *64*, 6381–6396.
DOI: 10.1021/acs.jmedchem.1c00442
<https://pubs.acs.org/doi/10.1021/acs.jmedchem.1c00442>
• Highlighted in *Synfacts* **2021**, *17*, 0816; DOI: 10.1055/s-0040-1719639
- (88) Tao, Y.; Teng, C.; Musho, T. D.; van de Burgt, L. J.; Lochner, E.; Heller, W. T.; Strouse, G. F.; Dudley, G. B.; Stiegman, A. E. Direct measurement of the selective microwave-induced heating of agglomerates of dipolar molecules: the origin of and parameters

- controlling a microwave specific superheating effect. *J. Phys. Chem. B* **2021**, 125, 2146–2156.
DOI: 10.1021/acs.jpcc.0c10291
<https://pubs.acs.org/doi/10.1021/acs.jpcc.0c10291>
- (87) Tavakoli, A.; Dudley, G. B. Synthesis of 4,4-dimethyl-1,6-heptadiyne and alcyopterosin O. *Org. Lett.* **2020**, 22, 8947–8951.
DOI: 10.1021/acs.orglett.0c03356
<https://pubs.acs.org/doi/full/10.1021/acs.orglett.0c03356>
- (86) Gaston, R., Jr.; Geldenhuys, W. J.; Dudley, G. B. Synthesis of illudinine from dimedone and identification of activity as a monoamine oxidase inhibitor. *J. Org. Chem.* **2020**, 85, 13429–13437. (Featured Article)
DOI: 10.1021/acs.joc.0c01301
<https://pubs.acs.org/doi/10.1021/acs.joc.0c01301>
- (85) Frasso, M. A.; Stiegman, A. E.; Dudley, G. B. Microwave-specific acceleration of a retro-Diels-Alder reaction. *Chem. Commun.* **2020**, 56, 11247–11250.
DOI: 10.1039/d0cc04584e
<https://pubs.rsc.org/en/content/articlelanding/2020/CC/D0CC04584E>
Chemistry World feature article: <https://www.chemistryworld.com/news/retro-diels-alder-study-links-solvent-viscosity-to-reaction-rate-under-microwave-heating/4012425.article>
- (84) Fulo, H. F.; Vincent, M. A.; Stiegman, A. E.; Dudley, G. B. Cooperative application of conventional and microwave heating. *Asian J. Org. Chem.* **2020**, 9, 961–966.
DOI: 10.1002/ajoc.202000157
<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajoc.202000157>
- (83) Frasso, M. A.; Stiegman, A. E.; Dudley, G. B. International perspectives on microwave heating in organic synthesis. *Kagaku to Kogyo (Chemistry and Chemical Industry, ISSN: 0368-5918)* **2020**, 73, 244–245.
(invited contribution to special issue on microwave chemistry)
- (82) McCullough, B. S.; Batsomboon, P.; Hutchinson, K. B.; Dudley, G. B.; Barrios, A. M. Synthesis and PTP inhibitory activity of illudalic acid and its methyl ether, with insights into selectivity for LAR PTP over other tyrosine phosphatases under physiologically relevant conditions. *J. Nat. Prod.* **2019**, 82, 3386–3393.
<https://pubs.acs.org/doi/full/10.1021/acs.jnatprod.9b00663>
- (81) Yang, J.; Guo, Y.; Wang, J.; Dudley, G. B.; Sun, K. DFT study on the reaction mechanism and regioselectivity for the [1,2]-anionic rearrangement of 2-benzyloxy pyridine derivatives. *Tetrahedron* **2019**, 75, 4451–4457.
<https://www.sciencedirect.com/science/article/pii/S0040402019306787>
- (80) Duangkamol, C.; Batsomboon, P.; Stiegman, A. E.; Dudley, G. B. Microwave heating outperforms conventional heating for a thermal reaction that produces a thermally labile product: Observations consistent with selective microwave heating. *Chem.–Asian J.* **2019**, 14, 2594–2597. DOI: 10.1002/asia.201900625
<https://onlinelibrary.wiley.com/doi/abs/10.1002/asia.201900625>
- (79) Yang, J.; Hoang, T. T.; Dudley, G. B. Alkynogenic fragmentation. *Org. Chem. Front.* **2019**, 6, 2560–2569.
<https://pubs.rsc.org/en/content/articlelanding/2019/qo/c9qo00266a/>
- (78) Fulo, H. F.; Albinak, P. A.; Dudley, G. B. Discussion Addendum for Protection of Alcohols using 2-Benzyloxy-1-methylpyridinium Trifluoromethanesulfonate: Methyl (*R*)-(-)-3-Benzyloxy-2-methyl Propanoate. *Org. Synth.* **2019**, 96, 124–136.

- <http://orgsyn.org/Content/pdfs/procedures/v96p0124.pdf>
- (77) Hayes, K.; Batsomboon, P.; Chen, W.-C. Becker, A.; Escherich, S.; Yang, Y.; Robart, A. R.; Dudley, G. B.; Geldenhuys, W. J.; Hazlehurst, L. A. Inhibition of the FAD containing ER oxidoreductin 1 (Ero1) protein by EN-460, a strategy for treatment of multiple myeloma. *Bioorg. Med. Chem.* **2019**, *27*, 1479–1488.
<https://www.sciencedirect.com/science/article/pii/S0968089618318856>
- (76) dos Passos Gomes, G.; Morrison, A. E.; Dudley, G. B.; Alabugin, I. V. Optimizing amine-mediated alkyne-allene isomerization to improve benzannulation cascades: synergy between theory and experiments. *Eur. J. Org. Chem.* **2019**, *2/3*, 512–518.
(Special Issue: Organic Reaction Mechanisms)
<https://onlinelibrary.wiley.com/doi/10.1002/ejoc.201801052>
- (75) El Anwar, S.; Laila, Z.; Ramsubhag, R.; Tlais, S.; Safa, A.; Dudley, G.; Naoufal, D. Synthesis and characterization of click-decahydrodecaborate derivatives by the copper(I) catalyzed [3+2] azide-alkyne cycloaddition reaction. *J. Organomet. Chem.* **2018**, *865*, 89–94.
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<http://pubs.acs.org/doi/abs/10.1021/ol035695y>

Research publications from pre- and post-doctoral studies:

- Mandal, M.; Yun, H.; Dudley, G. B.; Lin, S.; Tan, D. S.; Danishefsky, S. J. Total synthesis of guanacastepene A: a route to enantiomeric control. *J. Org. Chem.* **2005**, *70*, 10619–10637.
<http://pubs.acs.org/doi/full/10.1021/jo051470k>
- Dudley, G. B.; Danishefsky, S. J.; Sukenick, G. On the use of deuterium isotope effects in chemical synthesis. *Tetrahedron Lett.* **2002**, *43*, 5605–5606.
<http://www.sciencedirect.com/science/article/pii/S0040403902011140>
- Lin, S.; Dudley, G. B.; Tan, D. S.; Danishefsky, S. J. A stereoselective route to guanacastepene A via a surprising epoxidation. *Angew. Chem., Int. Ed.* **2002**, *41*, 2185–2188.
<http://onlinelibrary.wiley.com/doi/10.1002/1521-3773%2820020617%2941:12%3C2185::AID-ANIE2185%3E3.0.CO;2-0/full>
- Tan, D. S.; Dudley, G. B.; Danishefsky, S. J. Synthesis of the functionalized tricyclic skeleton of guanacastepene A: a tandem epoxide opening β -elimination–Knoevenagel cyclization. *Angew. Chem., Int. Ed.* **2002**, *41*, 2188–2191.
<http://onlinelibrary.wiley.com/doi/10.1002/1521-3773%2820020617%2941:12%3C2188::AID-ANIE2188%3E3.0.CO;2-J/full>

- Dudley, G. B.; Tan, D. S.; Kim, G.; Tanski, J. M.; Danishefsky, S. J. Remarkable stereoselectivity in the alkylation of a hydroazulenone: progress towards the total synthesis of guanacastepene. *Tetrahedron Lett.* **2001**, *42*, 6789–6791.
<http://www.sciencedirect.com/science/article/pii/S0040403901013429>
- Dudley, G. B.; Danishefsky, S. J. A four-step synthesis of the hydroazulene core of guanacastepene. *Org. Lett.* **2001**, *3*, 2399–2402.
<http://pubs.acs.org/doi/full/10.1021/ol016222z>
- Dudley, G. B.; Takaki, K. S.; Cha, D. C.; Danheiser, R. L. Total synthesis of (–)-ascochlorin via a cyclobutenone-based benzannulation strategy. *Org. Lett.* **2000**, *2*, 3407–3410.
<http://pubs.acs.org/doi/full/10.1021/ol006561c>
- Gee, K. R.; Kueper, L. W., III; Barnes, J.; Dudley, G. B.; Givens, R. S. Desyl esters of amino acid neurotransmitters. Phototriggers for biologically active neurotransmitters. *J. Org. Chem.* **1996**, *61*, 1228–1233.
<http://pubs.acs.org/doi/full/10.1021/jo951635x>

Book Chapters, Reference Works, and Other Manuscripts:

- (VIII) Dudley, G. B. US fentanyl rules are so strict they may prevent life-saving research. Invited Commentary in *New Scientist*; 19 January 2023.
<https://www.newscientist.com/article/2355617-us-fentanyl-rules-are-so-strict-they-may-prevent-life-saving-research/>
- (VII) Hoang, T. T.; Dudley, G. B.; Williams, L. J. Fragmentation Reactions. In *Comprehensive Organic Synthesis*, 2nd Edition; Molander, G., Knochel, P., Eds.; Elsevier: Oxford, 2014; Vol. 6, Chap. 30, 842–860.
- (VI) Dudley, G. B. Silacyclobutane, 1-[4-(bromomethyl)phenyl]-1-methyl- (and alcohol). In *Encyclopedia of Reagents for Organic Synthesis* [Online]; Crich, D., Fuchs, P. L., Charette, A. B., Rovis, T., Eds., John Wiley & Sons: Chichester. DOI: 10.1002/047084289X.rm01526, Article Online Posting Date: May 3, 2013.
<http://onlinelibrary.wiley.com/o/eros/articles/rn01526/frame.html>
- (V) Dudley, G. B. 2-(4-Methoxybenzyloxy)-4-methylquinoline. In *Encyclopedia of Reagents for Organic Synthesis* [Online]; Crich, D., Charette, A. B., Fuchs, P. L., Molander, G. A., Eds., John Wiley & Sons: Chichester. DOI: 10.1002/047084289X.rm01183, Article Online Posting Date: October 15, 2010.
<http://onlinelibrary.wiley.com/o/eros/articles/rn01183/frame.html>
- (IV) Dudley, G. B. 2-Benzyloxy-1-methylpyridinium trifluoromethanesulfonate. In *Encyclopedia of Reagents for Organic Synthesis* [Online]; Paquette, L., Fuchs, P., Crich, D., Molander, G., Eds., John Wiley & Sons: Chichester. DOI: 10.1002/047084289X.rm00906, Article Online Posting Date: September 15, 2008.
<http://onlinelibrary.wiley.com/o/eros/articles/rn00906/frame.html>
- (III) Kozytska, M. V.; Dudley, G. B. Four-membered rings with one silicon, germanium, tin, or lead atom. *Reference Module in Chemistry, Molecular Sciences and Chemical Engineering*, In *Comprehensive Heterocyclic Chemistry III*; Katritzky, A. R., Ramsden, C. A., Scriven, E. F. V., Taylor, R. J. K., Eds., Elsevier: Oxford, 2008; vol 2, pp 513–554.
<http://www.sciencedirect.com/science/article/pii/B978008044992000211X>
- (II) Danheiser, R. L.; Dudley, G. B.; Austin, W. F. Product class 13: alkenylketenes. In *Science of Synthesis: Houben–Weyl Methods of Molecular Transformation*. Bellus, D., Danheiser, R. L., Eds., Thieme: Stuttgart, 2006; Vol. 23, Chapter 13, pp 492–568.
- (I) Austin, W. F.; Kowalczyk, J. J.; Dudley, G. B.; Danheiser, R. L. Product class 7: alkylideneketenes. In *Science of Synthesis: Houben–Weyl Methods of Molecular*

Transformation. Bellus, D., Danheiser, R. L., Eds., Thieme: Stuttgart, 2006; Vol. 23, Chapter 7, pp 245–258.

Patents:

- (iii) Dudley, G. B.; Batsomboon, P.; Gaston, R., Jr.; Fulo, H. F. *Selective Phosphatase Inhibitors Based On Illudalic Acid*. International Patent Application PCT/US2021/043713 (July 29, 2021); US National Phase App. 18/007,296 filed January 27, 2023.
- (ii) Dudley, G. B. Reagent for synthesis of para-methoxybenzyl (PMB) ethers and associated methods. U.S. Patent No. 7,960,553 (2011).

1 patent, licensed from FSU by Sigma–Aldrich Chemical Company.

- (i) Dudley, G. B. Compounds and methods of arylmethylation (benzylation) as protection for alcohol groups during chemical synthesis. U.S. Patents 7,754,909 (2010), 7,915,437 (2011), 8,008,531 (2011), 8,334,414 (2012), 8,580,992 (2013).

5 patents, licensed from FSU by Sigma–Aldrich Chemical Company.

Research and Scholarly Presentations

2023

- 198. 12th Annual Conference of the American Council for Medicinally Active Plants (ACMAP), Charleston, WV
- 197. National Science Foundation, Arlington, VA
- 196. University of Louisville, KY
- 195. Northern Kentucky University, Highland Heights, KY

2022

- 194. ACS Southeast Meeting (SERMACS), San Juan, Puerto Rico (med chem talk)
- 193. ACS Southeast Meeting (SERMACS), San Juan, Puerto Rico (MW chem talk)
- 192. Chemistry and Pharmacology of Drug Abuse (CPDA) Conference, Boston, MA
- 191. Natural Products Gordon Conference
- 190. *US Senate Briefing panel (virtual)*
- 188. International Microwave Power Institute IMPI 54 Symposium, Savannah, GA
- 188. ACS Middle Atlantic Regional Meeting (MARM), New Jersey
- 187. Florida Heterocyclic Conference, Gainesville

2021

- 186. Pacificchem 2021 Conference (virtual)
- 185. ACS Southeast Meeting (SERMACS), Birmingham, AL

2020

- 184. Hamline College, St Paul, MN (virtual)

2019

- 183. ACS Southeast Meeting, Savannah, GA (Microwave Chemistry Symposium)

2018

- 182. Japan Society of Electromagnetic Wave Energy Applications (JEMEA) Symposium, Kitakyushu, Japan
- 181. Keio University, Tokyo, Japan
- 180. EYELA Corp, Tokyo, Japan
- 179. Asia-Pacific Microwave Conf., Kyoto, Japan
- 178. JSPS 188 Committee, Kyoto, Japan
- 177. WVU Health Sciences, Morgantown, WV
- 176. Kasetsart University, Bangkok, Thailand
- 175. IUPAC Green Chem. Conf., Bangkok, Thailand
- 174. *National Fed. Sentencing Seminar, Orlando, FL*
- 173. Yanshan University, Qinhuangdao, China
- 172. East China University of Science and Technology (ECUST), Shanghai

2017

- 171. *US Sentencing Commission panel, Wash. DC*
- 170. ACS Southeast Meeting, Charlotte, NC (Organic Chemistry)
- 169. ACS Southeast Meeting, Charlotte, NC (Chemistry and the Law)
- 168. ACS Southeast Meeting, Charlotte, NC (CEM Microwave Chemistry Symposium)
- 167. ACS Southwest Meeting, Lubbock, TX (Rising Stars in Organic Chemistry)
- 166. ACS Southwest Meeting, Lubbock, TX (Enabling Techniques for Organic Synthesis)
- 165. Youngstown State University, OH
- 164. *National Fed. Sentencing Seminar, Tampa, FL*

163. TSRC Enabling Technology for Reactions and Processes Conference, Telluride, CO
 162. 18th RGJ PhD Congress, Bangkok, Thailand
 161. Chulabhorn Research Institute, Thailand
 160. Chiang Mai University, Thailand
 159. *US Sentencing Commission panel, Wash. DC*
 158. *Middle Florida Federal Defenders, Orlando*
 157. ACS National Meeting (ORGN), San Fran, CA
 156. ACS National Meeting (CHAL), San Fran, CA
 155. ACS National Meeting (ORGN), San Fran, CA
 154. University of Pittsburgh, PA

2016

153. WVU Health Sciences, Morgantown, WV
 152. 57th Groupement d'Etude de Chimie Organique (GECO), Basque Region, Ascaïn, France
 151. TSRC Enabling Technology for Reactions and Processes Conference, Telluride, CO
 150. West Virginia University, Morgantown
 149. Rensselaer Polytechnic Institute, Troy, NY
 148. Mona Symposium on Natural Products and Medicinal Chemistry, Kingston, Jamaica

2015

147. Pacificchem 2015, Honolulu, HI (*organic*)
 146. Pacificchem 2015, Honolulu, HI (*clean energy*)
 145. TSRC Enabling Technology for Reactions and Processes Conference, Telluride, CO
 144. ACS Florida Meeting, Tampa (*chem ed*)
 143. ACS Florida Meeting, Tampa (*organic*)
 142. Georgia State University, Atlanta
 141. University of California, San Francisco
 140. Rigel Pharmaceuticals, San Francisco
 139. Auburn University, AL
 138. Rutgers University, Piscataway, NJ

2014

137. University of Kansas, Lawrence
 136. *North Carolina Federal Defenders, Raleigh*
 135. CEM Corporation, Matthews, NC
 134. University of North Carolina, Greensboro
 133. Wake Forest University, Winston-Salem, NC
 132. University of California, Merced
 131. Utah State University, Logan
 130. Brigham Young University, Provo, UT
 129. Cubist Pharmaceuticals, Lexington, MA
 128. Ensemble Pharmaceuticals, Cambridge, MA
 127. TSRC Accelerating Reaction Discovery Conference, Telluride, CO
 126. Natural Products Gordon Conference
 125. Organic Reactions Gordon Conference
 124. *National Federal Defenders Convention, Cleveland, OH*

123. Florida Heterocyclic Conference, Gainesville
 122. Florida State University, Tallahassee

2013

121. Lebanese University, Beirut
 120. University of New Mexico, Albuquerque
 119. New Mexico State University, Las Cruces
 118. University of South Alabama, Mobile
 117. University of West Florida, Pensacola

2012

116. Max Plank Institute, Potsdam, Germany
 115. University of Hannover, Germany
 114. Technical University, Dortmund, Germany
 113. Louisiana State University, Baton Rouge
 112. Notre Dame University, South Bend, IN
 111. University of Chicago, IL
 110. University of Illinois, Chicago
 109. University of New Hampshire, Durham
 108. Dartmouth College, Hanover, NH
 107. University of the South, Sewanee, TN
 106. University of Tennessee, Knoxville
 105. Middle Tenn State Univ, Murfreesboro, TN
 104. ACS National Meeting, Philadelphia, PA
 103. ACS National Meeting, Philadelphia, PA
 102. ACS Florida Meeting, Tampa
 101. Organic Faculty of Florida Conference
 100. FAMU-FSU Engineering, Tallahassee
 99. FSU Biomedical Sciences Symposium

2011

98. University of Virginia, Charlottesville
 97. Univ of Mary Washington, Fredericksburg, VA
 96. ACS Southeast Meeting, Richmond, VA
 95. NanoFlorida Conference, Miami, FL
 94. University of Houston, TX
 93. University of Texas, San Antonio
 92. University of Minnesota, Twin Cities
 91. University of Minnesota, Duluth
 90. North Dakota State University, Fargo
 89. NSERC-CREATE Program, Ottawa, Canada
 88. University of Ottawa, Canada
 87. Florida Heterocyclic Conference, Gainesville

2010

86. Federal University of Ouro Preto, Brazil
 85. Federal University of Minas Gerais, Brazil
 84. Federal University of Fluminense, Brazil
 83. Federal University of Rio de Janeiro, Brazil
 82. UNICAMP, Campinas, Brazil
 81. University of Sao Paulo, Brazil
 80. Sunrise Rotary Club, Tallahassee, FL

79. Tallahassee Economic Develop. Council, FL

2009

- 78. University of Toledo, Ohio
- 77. Wayne State University, Detroit, MI
- 76. University of California, Berkeley
- 75. Rigel Pharmaceuticals, San Francisco, CA
- 74. FSU College of Medicine, Tallahassee
- 73. Univ of Southern Mississippi, Hattiesburg
- 72. University of South Florida, Tampa
- 71. Natural Products Gordon Conference
- 70. Innovation Park, Tallahassee, FL
- 69. University of Oregon, Eugene
- 68. Oregon State University, Corvallis
- 67. Berry College, Mt Berry, GA

2008

- 66. BioFine Chemical Process Design Conference, Sanibel Island, FL
- 65. ACS Southeast Meeting, Nashville, TN
- 64. University of Vermont, Burlington
- 63. Schering–Plough Research, Cambridge, MA
- 62. Nanyang Technical University, Singapore
- 61. A*Star Institute of Chemical and Engineering Sciences, Singapore
- 60. National University of Singapore
- 59. Chulabhorn Research Institute, Thailand
- 58. Chulalongkorn Univ, Bangkok, Thailand
- 57. Schering–Plough Research, Kenilworth, NJ
- 56. ACS Florida Meeting, Orlando
- 55. U of British Columbia, Vancouver, Canada
- 54. Simon Fraser University, Burnaby, Canada
- 53. University of Washington, Seattle
- 52. Organic Faculty of Florida Conference
- 51. Texas Christian University, Fort Worth
- 50. University of Texas, Arlington
- 49. U of Texas Southwestern Med Center, Dallas

2007

- 48. Florida State University, Tallahassee
- 47. International Conference on the Chemistry of Antibiotics (ICCA-X), Nashville, TN
- 46. ACS Florida Meeting, Orlando
- 45. University of Wisconsin, Milwaukee
- 44. Marquette University, Milwaukee, WI
- 43. ACS National Meeting, Chicago, IL
- 42. University of Pennsylvania, Philadelphia
- 41. University of California, Santa Barbara

40. University of California, San Diego

39. Emory University, Atlanta, GA

38. Tennessee State University, Nashville

2006

- 37. University of Arkansas, Fayetteville
- 36. University of Delaware, Wilmington
- 35. Temple University, Philadelphia, PA
- 34. ACS Southeast Meeting, Augusta, GA
- 33. East Carolina Univ, Greenville, NC
- 32. ACS National Meeting, San Francisco, CA
- 31. Organic Reactions Gordon Conference
- 30. Eli Lilly Pharmaceuticals, Indianapolis, IN
- 29. ACS Florida Meeting, Orlando
- 27. Organic Faculty of Florida Conference
- 27. Univ of North Florida, Jacksonville
- 26. Vanderbilt University, Nashville, TN
- 25. Austin Peay State Univ, Clarksville, TN
- 24. Merck Research, Rahway, NJ
- 23. Univ of North Carolina, Chapel Hill
- 22. GlaxoSmithKline, RTP, NC
- 21. Duke University, Durham, NC

2005

- 20. Univ of Massachusetts, Amherst
- 19. Smith College, Northampton, MA
- 18. University of Connecticut, Storrs
- 17. University of Houston, TX
- 16. University of Florida, Gainesville
- 15. University of Georgia, Athens
- 14. Gulf Coast Chemistry Conference
- 13. Natural Products Gordon Conference
- 12. University of Alabama, Tuscaloosa
- 11. University of West Florida, Pensacola

2004

- 10. Rutgers University, New Brunswick, NJ
- 9. Barry University, Miami, FL
- 8. Southern University, Baton Rouge, LA
- 7. Kennesaw State University, Kennesaw, GA
- 6. ACS Florida Meeting, Orlando
- 5. Organic Faculty of Florida Conference

2003

- 4. Florida Institute of Technology, Melbourne
- 3. College of Charleston, SC
- 2. Florida International University, Miami
- 1. University of Miami, FL

Financial Support

Current Funding

- 08/01/2022–07/31/2025 *Chemical synthesis of illudalic acid analogs for stimulant use disorder*
Source: National Institutes of Health – National Institute on Drug Abuse
Award (Amount): NIH R15DA056843 (\$380,000 total; \$250,000 direct)
Role: PI (100%)
- 08/01/2022–07/31/2025 *Regioselective [2+2+2] Cyclotrimerizations*
Source: National Science Foundation
Award (Amount): CHE-2154773 (\$525,000 total; \$355,358 direct)
Role: formerly PI (current PI is Brian Popp while I am at NSF)
- 10/01/2023–09/30/2026 *Equipment MRI: Track 3 Acquisition of Helium Recovery Equipment at West Virginia University*
Source: National Science Foundation
Award (Amount): MRI (\$342,989 total; \$325,829 direct)
Role: formerly co-PI (<20%; removed when I joined NSF)

Prior Funding

- 08/2022–07/2024 *Mode of Action and Improving the Efficacy of the Novel Antibiotics Resazomycins*
Source: WV INBRE Major PUI Research Award
Award to West Liberty University (WLU) (Amount): \$351,250 total; \$250,000 direct
WVU budget (Amount): \$25,000 total; \$25,000 direct
Role: Collaborator (100% on WVU budget) (Project PI: Deanna Schmitt, WLU)
- 08/2017–07/2022 *Dielectric Loss Processes and Microwave Effects on Reactions in Homogeneous Solutions*
Source: National Science Foundation
Award (Amount): NSF-CHE 1665029 (\$470,000 total; \$382,432 direct)
WVU subcontract: \$221,750 total; \$154,500 direct
Role: co-PI (50%); PI: Al Stiegman, Florida State University (50%)
- 08/2020–07/2022 *Design and synthesis of phosphatase inhibitors as potential chemotherapeutics for chronic disease*
Source: WV INBRE Chronic Disease Research Program (CDRP)
Award (Amount): \$136,800 total; \$90,000 direct
Role: PI (80%); co-I's: Justin Legleiter (10%) and Aaron Robart (10%)
- 08/2020–12/2021 *Regioselective Nickel-Catalyzed [2+2+2] Cyclotrimerizations*
Source: WVU Program to Stimulate Competitive Research (PSCoR)
Award (Amount): \$22,400 direct
Role: PI (50%); co-PI: Brian Popp (50%)
- 05/2019–12/2020 *Neopentylene-based synthetic building blocks for organic and medicinal chemistry*
Source: Don and Linda Brodie Resource Fund for Innovation, WVU
Award (Amount): \$38,000 direct
Role: PI (50%); co-PI: Brian Popp (50%)
- 07/2018–06/2020 *Experimental therapeutics synthesis collaborative*
Source: The Estate of Dr. William Price Bittinger
Award (Amount): WVU-SOM Foundation (\$96,626 total; \$96,626 direct)
Role: PI; co-PI: Paul Lockman
- 09/2013–09/2018 *Synthesis of high-value alkynes*
Source: National Science Foundation
Award (Amount): NSF-CHE 1300722 (\$450,000 total; \$336,615 direct)
Role: PI (80%); co-PI: Igor Alabugin (20%)

- 07/2011–08/2013 *New fragmentation reactions and strategies for chemical synthesis*
Source: FSU Research Foundation
Award (Amount): FSU-BRIDGE (\$84,814)
Role: PI
- 07/2008–06/2011 *New fragmentation reactions and strategies for chemical synthesis*
Source: National Science Foundation
Award (Amount): NSF-CHE 0749918 (\$378,000 total; \$272,677 direct)
Role: PI
- 05/2011–08/2011 *Microwave-actuated organic reagents*
Source: FSU Committee on Faculty Research Support (COFRS)
Award (Amount): Faculty Summer Awards (\$14,000)
Role: PI
- 04/2010–03/2011 *Developing scholar award*
Source: FSU Council on Research Creativity (CRC)
Award (Amount): Developing Scholars 2010 Award (\$10,000)
Role: PI
- 01/2008–12/2008 *Organic Reagents for Current and Future Markets*
Source: FSU Research Foundation
Award (Amount): GAP award (\$46,400)
Role: PI
- 07/2005–06/2008 *Organic Synthesis and Methodology for Roseophilin, A Pharmacologically Active Natural Product*
Source: James and Ester King Biomedical Research Program, Florida Department of Health
Award (Amount): FBRP-DOH, 016272 (\$450,000 total; \$429,618 direct)
Role: PI
- 01/2004–12/2007 *Ring Expansion Strategies for Preparing Cyclophanes: Concise Syntheses of Roseophilin and Floresolide A*
Source: Research Corporation
Award (Amount): Research Innovation Award, RI1161 (\$35,000)
Role: PI
- 06/2005–08/2007 *An Allene-Centered Pericyclic Reaction Sequence for the Synthesis of the Cyathane Diterpenes*
Source: American Chemical Society, Petroleum Research Fund
Award (Amount): PRF Type G, 42180-G1 (\$35,000)
Role: PI
- 05/2004 *Synthesis of Cytotoxic Cyclophanes: Haouamine A*
Source: Oak Ridge Associated Universities
Award (Amount): Ralph E. Powe Junior Faculty Enhancement Award (\$10,000)
Role: PI
- 05/2003–08/2003 *New Reagents for Organic Synthesis: Strained Silacycles*
Source: FSU Council for Research and Creativity (CRC)
Award (Amount): First Year Assistant Professor Award (\$12,000)
Role: PI

Expert Witness and Legal Consulting

Representative Reports and Contributions:

- *Brief Of Expert Forensic Scientists As Amici Curiae In Support Of Petitioner Stephen McFadden* (Stephen Dominick McFadden v. United States of America)
 - Amicus Brief to the Supreme Court of the United States

- Counsel of Record: Prof. Gerald M. Finkel, Charleston School of Law
<http://sblog.s3.amazonaws.com/wp-content/uploads/2015/03/14-378-tsac-Joseph-Bono.pdf>
- *Opinion testimony before the US Sentencing Commission*
 - Corresponding oral testimony at the public hearing on April 18, 2017 available at:
<https://www.ussc.gov/policymaking/meetings-hearings/public-hearing-april-18-2017>
- *Opinion testimony on synthetic cathinones for the public hearing on October 4, 2017*
 - Oral testimony available at:
<https://www.ussc.gov/policymaking/meetings-hearings/public-hearing-october-4-2017>
- *Panel on Fentanyl-Related Substances* (US Senate Briefing, June 10, 2022)
 - Video available at: <https://www.youtube.com/watch?v=myl6I3vLXb8>
- *Scientific analysis and opinion on the “substantially similar” standard for Prong One of the definition of Controlled Substance Analogues*
- *Summary of scientific opinion on chemical structures*
- *Expert opinion [on] the comparative pharmacology of JWH-018 and XLR-11*
- *4-ANPP and its structural relationship to fentanyl*
- *Affidavit on extraction of DMT from MHRB*
- *Sentencing guideline considerations for synthetic cannabinoids*
- *Expert evaluation / opinion regarding cocaine base isomers*
- *Evaluation of state and federal schedules of controlled substances*
- *Expert evaluation and opinions regarding opiate narcotic drug controlled substances in New York, New Jersey, and/or Federal law*
- *Isomers of cocaine and heroin under Michigan and Federal law*
- *Is dibutylone a “positional isomer” of pentylone?*

Expert witness and testimony experience:

50. United States Federal Court, Southern District of Florida, West Palm Beach, 2024-02-06
Case 9:23-cr-80156-DMM: *Sentencing hearing for a criminal proceeding* (remote)
Defendant: Humberto Jose Forte
Provided critical review, expert opinion, and testimony on chemistry, pharmacology, and sentencing guideline considerations for tapentadol as compared to tramadol and morphine.
49. United States Federal Court, Southern District of New York, 2023-12-06
Case No. 7:22-cr-00665-PMH: *Jury trial for a criminal proceeding*
Defendant: Oldamo Frazer
Provided testimony as an expert in chemistry on methods for chemical analysis of fentanyl and other substances and on similarity comparisons involving chemical structures.
48. United States Federal Court, District of Colorado, 2023-07-24
Case No. 21-cr-597-BAH: *Jury trial for a criminal proceeding*
Defendant: Javier Algreto Vazquez
Provided testimony as an expert in chemistry, chemical structure, and synthesis on methods for producing methamphetamine and other uses for its precursor chemicals.
47. United States Federal Court, District of Colorado, 2023-02-16
Case No. 22-cr-00212-RMR: *Sentencing hearing for a criminal proceeding* (remote)
Defendant: Joseph Eugene Clements
Provided testimony as an expert in chemistry, chemical structure, synthesis, and molecular pharmacology on the controlled substance dimethyltryptamine (DMT) and its extraction from *Mimosa hostilis* root bark (MHRB).

46. United States Federal Court, Northern District of Ohio, Cleveland, 2022-12-21
Case 1:22-cr-00050-BYP: *Sentencing hearing for a criminal proceeding* (remote)
Defendant: Peter Dill Lowe
Provided expert testimony on fentanyl, fentanyl analogues, and 4-ANPP.
45. United States Federal Court, Eastern District of Michigan, Detroit, 2022-08-09
Case 2:20-cr-20449-PDB-APP: *Evidentiary hearing for a criminal proceeding*
Defendant: Robert Lee Taylor
Provided expert testimony on chemistry terminology related to isomers of cocaine.
44. United States Federal Court, Western District of Michigan, Grand Rapids, 2022-07-08
Case 1:21-cr-00034-PLM: *Sentencing hearing for a criminal proceeding* (remote)
Defendant: Delando Johnson
Provided expert testimony on chemistry terminology related to isomers of cocaine.
43. United States Federal Court, Western District of Michigan, Grand Rapids, 2022-05-12
Case 1:21-cr-00042-JTN: *Evidentiary hearing for a criminal proceeding* (remote)
Defendant: Idris Quintell Wilkes
Provided expert testimony on chemistry terminology related to isomers of cocaine.
42. United States Federal Court, Western District of Michigan, Grand Rapids, 2022-02-04
Case 1:21-cr-00118-PLM: *Evidentiary hearing for a criminal proceeding* (remote)
Defendant: James Robinson
Provided expert testimony on chemistry terminology related to isomers of cocaine.
41. State of Florida 13th Judicial Circuit, Hillsborough County, 2021-03-04
Case No. 18-CF-007123-B: *Motion Hearing* (remote)
Defendant: Donya Kareem Hussein
Provided expert testimony and opinion on chemical composition of marijuana and synthetic marijuana as they may relate to detection by drug-sniffing dogs.
40. United States Federal Court, District of Nevada, Las Vegas, 2020-01-10
Case 2:15-cr-00285-APG-GWF: *Sentencing hearing for a criminal proceeding*
Defendant: Burton Ritchie
Provided expert testimony and opinion on the chemical structure and sentencing guideline considerations for synthetic cannabinoid substances including XLR-11.
39. United States Federal Court, Middle District of Florida, Tampa, 2019-08-27
Case 8:13-cr-00269-JDW-CPT: *Sentencing hearing for a criminal proceeding*
Defendant: Mobashar Z. Tahir
Provided expert testimony and opinion on the chemical structures of synthetic cannabinoids including JWH-018, UR-144, and XLR-11 for considerations relevant to regulatory controls of controlled substances and controlled substance analogues.
38. United States Federal Court, Northern District of New York, Albany, 2019-08-20
Case 1:18-cr-00150-GLS: *Sentencing hearing for a criminal proceeding*
Defendant: Mansoor A. Ghaleb
Provided expert testimony and opinion on the chemistry, pharmacology, and sentencing guideline considerations for synthetic cannabinoids including AMB-FUBINACA (aka FUB-AMB) compared to actual marijuana and THC.
37. United States Federal Court, District of Nevada, Las Vegas, 2019-06-26
Case 2:15-cr-00285-APG-GWF: *Criminal trial by jury*

Defendant: Burton Ritchie

Provided expert testimony and opinion on the chemical structure of synthetic cannabinoid substances including XLR-11, which was alleged to be a Controlled Substance Analogue of JWH-018.

36. United States Federal Court, Southern District of Florida, Miami, 2018-12-12
Case 1:17-CR-20904-Ungaro/O'Sullivan: *Sentencing hearing for a criminal proceeding*
Defendant: Danny Rodriguez
Provided expert testimony and opinion on the chemistry and pharmacology of synthetic cannabinoids including ADB-FUBINACA as compared to actual marijuana and THC.
35. United States Federal Court, Northern District of Georgia, Gainesville, 2018-10-10
Case 2:16-CR-032-03-RWS: *Sentencing hearing for a criminal proceeding*
Defendant: Lora Pace
Provided expert testimony and opinion on the preparation, composition, molecular structure and pharmacology, and effects on the central nervous system of the synthetic cannabinoids XLR-11, AB-CHMINACA, and FUB-AMB as ingredients of "synthetic marijuana" (aka smokeable synthetic cannabinoids) as compared to actual marijuana and THC.
34. United States Federal Court, Middle District of Florida, Jacksonville, 2018-09-28
Case 3:17-cr-00086-TJC-JRK: *Evidentiary Daubert-type hearing for a criminal proceeding*
Defendant: Kevin Clark
Provided expert testimony and opinion on the chemical structure, molecular pharmacology, and stimulant effects of MPHP as related to other stimulants including pyrovalerone, α -PVP, cocaine, and methamphetamine in connection to criminal indictment under the Controlled Substance Analogue Enforcement Act.
33. United States Federal Court, Eastern District of California, Fresno, 2018-06-28
15-cr-101-DAD: *Criminal trial by jury*
Defendant: Douglas Jason Way
Provided expert testimony and opinion on the chemical structure of synthetic cannabinoid substances including XLR-11, which was alleged to be a Controlled Substance Analogue of JWH-018.
32. United States Federal Court, Northern District of Texas, Dallas, 2018-06-18
Case 3:14-cr-00298-M: *Daubert hearing for expert witnesses in a criminal proceeding*
Defendant: Gas Pipe, Inc.
Provided expert testimony and opinion on the synthetic cannabinoid substances AM-2201, XLR-11, JWH-250, and PB-22, which were alleged to be Controlled Substance Analogues of JWH-018; 5F-PB-22 and THJ-2201, which were alleged to be Controlled Substance Analogues of AM-2201; and FUB-PB-22, which was alleged to be a Controlled Substance Analogue of 5F-PB-22.
31. United States Federal Court, Middle District of Florida, Orlando, 2018-01-24
6:17-CR-165-Orl-40KRS-Byron: *Criminal trial by jury*
Defendant: Jeremy Achey
Provided expert testimony and opinion on the chemical structure of synthetic substances including 4-AcO-DMT and tetrahydrofuranlyl fentanyl, which were alleged to be Controlled Substance Analogues of psilocin and fentanyl, respectively.
30. United States Federal Court, Northern District of Texas, Dallas, 2017-12-21
Case 3:16-CR-00419-Fitzwater: *Sentencing hearing for a criminal proceeding*
Defendant: Gabrielle Armstrong

Provided expert testimony and opinion on the chemical structure of *N*-ethylpentylone (a structural analogue of pentylone) and its putative pharmacological effects (based on the structure-activity relationship in medicinal chemistry) relative to substances referenced in the Sentencing Guidelines for the purposes of sentencing considerations.

29. United States Sentencing Commission, Washington, DC, 2017-10-04
Review of Sentencing Guidelines: *Public hearing on synthetic cathinones*
Provided invited written opinion report and oral testimony on revisions to the Guidelines being considered in light of emerging synthetic cathinone drugs of abuse. Testimony included recommendations for specific and categorical coverage of cathinone drugs. Written report and video of panel testimony and discussion (Panel 3) available at the link provided below:
<https://www.ussc.gov/policymaking/meetings-hearings/public-hearing-october-4-2017>
28. United States Sentencing Commission, Washington, DC, 2017-04-18
Review of Sentencing Guidelines: *Public hearing on synthetic drugs*
Provided invited written opinion report and oral testimony on revisions to the Guidelines being considered in light of emerging synthetic drugs of abuse. Testimony included recommendations for improving the consistency and clarity of the Guidelines and for the addition of new synthetic cannabinoid and cathinone substances. Written report and video of panel testimony and discussion (Panel 5) available at the link provided below:
<http://www.ussc.gov/policymaking/meetings-hearings/public-hearing-april-18-2017>
27. United States Federal Court, Northern District of West Virginia, Clarksburg, 2017-03-27
Case 1:16-cr-00065-IMK-JES: *Daubert hearing for experts in a criminal proceeding*
Defendant: Graziano
Prepared expert testimony and opinion on the chemical structures of synthetic substances including UR-144, XLR-11, AB-FUBINACA, STS-135, and FUB-PB-22, which were alleged to be Controlled Substance Analogues (*plea agreement reached prior to hearing*).
26. United States Federal Court, District of Kansas, Topeka, 2017-03-07
Case 5:14-cr-40005-DDC: *Criminal trial by jury*
Defendant: Craig Broombaugh
Provided expert testimony and opinion on the chemical structure of synthetic cannabinoid, cathinone, and amphetamine substances including JWH-122, AM-2201, JWH-210, MAM-2201, JWH-081, RCS-4, JWH-250, UR-144, XLR-11, MePPP, MXE, 5-MeO-DALT, pentedrone, 4-FMC, and 4-FA, which were alleged to be Controlled Substance Analogues.
25. United States Federal Court, Southern District of Florida, West Palm Beach, 2017-01-31
Case 2:16-14002-CR-Rosenberg: *Sentencing hearing for a criminal proceeding*
Defendant: Julius Reason
Provided expert testimony and opinion on the chemical structures of ethylone and dibutylone, the putative pharmacological effects of ethylone, and their respective similarities and differences with respect to substances referenced in the Sentencing Guidelines for the purposes of sentencing considerations.
24. United States Federal Court, Eastern District of Virginia, Norfolk, 2017-01-19
Case 4:15-cr-0018-Jackson: *Criminal trial by jury (re-trial after hung jury in October)*
Defendant: Burton Ritchie
Provided expert testimony and opinion on the chemical structure of synthetic cannabinoid substances including UR-144 and XLR-11, which were alleged to be Controlled Substance Analogues of JWH-018.

23. United States Federal Court, Eastern District of Virginia, Norfolk, 2016-10-14
4:15-cr-0018-Jackson: *Criminal trial by jury*
Defendant: Burton Ritchie
Provided expert testimony and opinion on the chemical structure of synthetic cannabinoid substances including UR-144 and XLR-11, which were alleged to be Controlled Substance Analogues of JWH-018.
22. United States Federal Court, District of New Jersey, 2016-10-13
Case 2:14-cr-00186-KSH: *Sentencing hearing for a criminal proceeding*
Defendant: Pedro Arroyo
Provided expert testimony and opinion on the chemical structure, pharmacological effects, and potency of the controlled substance, methylenedioxyamfetamine (methydone).
21. United States Federal Court, Middle District of Florida, Orlando, 2016-09-14
6:16-cr-00024-GAP-DAB: *Criminal trial by jury*
Defendant: Jason Phifer
Provided expert testimony and opinion on the chemical structures of butylone and ethylone as to whether or not ethylone qualifies as a positional isomer of butylone based on various definitions of the term “positional isomer”.
20. United States Federal Court, Middle District of Florida, Tampa, 2016-07-15
Case 8:15-cr-00410-JDW-TBM: *Sentencing hearing for a criminal proceeding*
Defendant: Omar Zeidan Zeidan
Provided expert testimony and opinion on the preparation, chemical structure, molecular pharmacology, and effects on the central nervous system of the synthetic cannabinoids XLR-11 and AB-FUBINACA as ingredients of so-called “synthetic marijuana” or “Spice” as compared to actual marijuana and THC.
19. United States Federal Court, Southern District of Florida, West Palm Beach, 2016-05-20
Case 2:15-80068-CR-Rosenberg: *Sentencing hearing for a criminal proceeding*
Defendant: Kevin Raphael Bully
Provided expert testimony and opinion on the chemical structures of controlled substances methylenedioxyamfetamine (MDEA, ethylone) and α -pyrrolidinovalerophenone (α -PVP) and their respective similarities and differences with respect to substances referenced in the Guidelines Manual for the purposes of sentencing considerations.
18. United States Federal Court, Middle District of Florida, Tampa, 2016-05-18
Case 8:15-cr-00064-CEH-TBM: *Sentencing hearing for a criminal proceeding*
Defendant: Saher Abdullah
Provided expert testimony and opinion on the preparation, molecular pharmacology, and pharmacological effects of so-called “synthetic marijuana” containing the controlled substance XLR-11 as compared to marijuana and THC.
17. United States Federal Court, District of New Mexico, Santa Fe, 2016-05-10
Case 1:12-cr-001766 MCA: *Daubert hearing for expert witnesses in a criminal proceeding*
Defendant: Hussein Al-Omari
Prepared expert testimony and opinion on the chemical structure and pharmacological effects of synthetic substances including AM-2201, UR-144, 4-MEC, and α -PVP, which were alleged to be Controlled Substance Analogues (*charges dropped prior to hearing*).
16. United States Federal Court, Middle District of Florida, Ft. Myers, 2016-03-28
Case 2:15-cr-00004-SPC-CM: *Sentencing hearing for a criminal proceeding*

- Defendant: Travis Riddle
Provided expert testimony and opinion on the controlled substance dimethyltryptamine (DMT): extraction from natural sources, methods of abuse, and pharmacological effects
15. United States Federal Court, District of Utah, Salt Lake City, 2016-02-29
Case 2:13-cr-00780-CW-DBP: *Daubert hearing for experts in a criminal proceeding*
Defendant: Muhammad Mansoor
Prepared expert testimony and opinion on the chemical structure and pharmacological effects of synthetic substances including AM-2201, JWH-122, MAM-2201, UR-144, XLR-11, and 5-MeO-DALT, which were alleged to be Controlled Substance Analogues (*charges dropped at the start of the hearing*).
 14. United States Federal Court, Southern District of Florida, West Palm Beach, 2015-12-11
Case 2:15-cr-14034-DMM: *Sentencing hearing for a criminal proceeding*
Defendant: Saiful Hossain
Provided expert testimony and opinion on molecular pharmacology and pharmacological effects of so-called “synthetic marijuana” containing the controlled substance XLR-11 as compared to marijuana and THC
 13. State of Florida 15th Judicial Circuit, Palm Beach County, 2015-11-05
Case No. 2013CF009053BMB: *Criminal trial by jury*
Defendant: William Sands
Provided expert testimony and opinion on substances alleged to be synthetic marijuana, and on the forensic detection and analysis of the controlled substance PB-22
 12. United States Federal Court, Southern District of Florida, Miami, 2015-10-23
Case 2:15-20350-CR: *Sentencing hearing for a criminal proceeding*
Defendant: Mario Malespin
Provided expert testimony and opinion on the chemical structure, pharmacological effects, and potency of the controlled substance, methylenedioxyethcathinone (MDEC, ethylone)
 11. United States Federal Court, District of New Mexico, Albuquerque, 2015-07-07
Case 1:13-cr-00571-MCA: *Daubert hearing for expert witnesses in a criminal proceeding*
Defendant: Nathan Coccimiglio
Provided expert testimony and opinion on synthetic cannabinoid substances including AM-2201, AM-694, JWH-250, UR-144, and XLR-11, which were alleged to be Controlled Substance Analogues of JWH-018
 10. United States Federal Court, Middle District of Florida, Tampa, 2015-05-05
Case 8:14-cr-00409-CEH-TBM: *Sentencing hearing for a criminal proceeding*
Defendant: Wagner Cruz
Provided expert testimony and opinion on the chemical structure, pharmacological effects, and potency of the controlled substance, methylenedioxyethcathinone (MDEC, ethylone)
 9. United States Federal Court, Middle District of Florida, Ft. Myers, 2015-04-28
Case 2:14-CR-79-FIM-38DNF: *Sentencing hearing for a criminal proceeding*
Defendant: Ferenc Palfalvi
Provided expert testimony and opinion on the chemical structure, pharmacological effects, and potency of the controlled substance, methylenedioxyethcathinone (MDEC, ethylone)
 8. United States Federal Court, Middle District of Florida, Tampa, 2015-01-27
Case 8:14-cr-00387-VMC-TBM: *Sentencing hearing for a criminal proceeding*
Defendant: Donald Reche Caldwell

- Provided expert testimony and opinion on the chemical structure, pharmacological effects, and potency of the controlled substance, methylenedioxyethcathinone (MDEC, ethylone)
7. United States Federal Court, District of Nevada, Las Vegas, 2014-12-03
Case 2:13-cr-00255-JAD-GWF: *Sentencing hearing for a criminal proceeding*
Defendant: Syvilay Thannavongsa
(telephonic testimony) Provided expert testimony and opinion on the chemical structure of the controlled substance, methylenedioxymethcathinone (MDMC, methylone)
 6. United States Federal Court, Middle District of Florida, Tampa, 2014-11-18
Case 8:13-cr-00421-MSS-TGW: *Sentencing hearing for a criminal proceeding*
Defendant: John McGuire
Provided expert testimony and opinion on the chemical structure of the controlled substance, methylenedioxymethcathinone (MDMC, methylone)
 5. United States Federal Court, Eastern District of New York, Brooklyn, 2014-08-20
Case 13CR00570 (JBW): *Sentencing hearing for a criminal proceeding*
Defendant: Chin Chong
(telephonic testimony) Provided expert testimony and opinion on the chemical structure of the controlled substance, methylenedioxymethcathinone (MDMC, methylone)
 4. United States Federal Court, District of Minnesota, Minneapolis, 2013-09-30
CASE 0:12-cr-00305-DSD-LIB: *Criminal trial by jury*
Defendant: James Robert Carlson
Provided expert testimony and opinion on the chemical structure and pharmacological effects of synthetic cannabinoid substances including AM-2201, UR-144, and XLR-11, which were alleged to be Controlled Substance Analogues of JWH-018
 3. State of Louisiana 22nd Judicial District Court, Parish of St Tammany, 2013-02-06
Case No. 524706/7 D: *Hearing on a motion to quash a criminal indictment*
Defendant: David D'Aquin
Provided expert testimony and opinion on the chemical structure and pharmacological effects of synthetic cannabinoid substances of UR-144 and XLR-11, which were alleged to be Controlled Substance Analogues of JWH-018
 2. United States Federal Court, Eastern District of Wisconsin, Milwaukee, 2013-02-28
Case 2:12-cv-01186-RTR: *Hearing on a petition for return of property*
Petitioner: The Smoke Shop, LLC
Provided expert testimony and opinion on the chemical structure and pharmacological effects of UR-144 and XLR-11, alleged to be Controlled Substance Analogues of JWH-018
 1. United States Federal Court, Middle District of Florida, Orlando, 2012-12-06
6:12-cr-209-Orl-37DAB: *Joint hearing on a motion to dismiss a criminal indictment and a petition for return of property*
Defendants: Ilan Fedida and Timothy Hummel
Attended the hearing and wrote a brief on scientific considerations for the Court