

## Personal Information

Name: **Charles David Weaver**

Office Address: 459B Preston Research Building  
Vanderbilt University School of Medicine  
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Office Phone: 615-936-6461

Date of Birth: May 29, 1967

Place of Birth: Knoxville, TN

Home Address: 3012 Bridlewood Trail  
Franklin, TN 37067

Personal Phone: 615-509-3288

Marital Status: Married, Susan Elise Hale

Children: Julia Grace Hale Weaver, January 28, 2002



## Education

University of Tennessee, Knoxville, TN, Bachelor of Science, 1985-1989

University of Tennessee, Knoxville, TN, Doctor of Philosophy, 1989-1994, Structural and Functional Characterization of the Nodulin 26 Ion Channel and the Calmodulin-like Domain Protein Kinase from Soybean Root Nodules

Vanderbilt University, Nashville, TN, Post-doctoral Fellow, Todd Verdoorn (mentor), 1994-1997

## Academic Appointments

Research Assistant Professor, Department of Pharmacology, Vanderbilt University, 2004-2005

Research Associate Professor, Department of Pharmacology, Vanderbilt University, 2005-2011

Assistant Professor, Department of Pharmacology, Vanderbilt University, 2011-2017

Adjunct Assistant Professor, Neuroscience and Pharmacology, Meharry Medical College, 2015-2017

Associate Professor, Department of Pharmacology, Vanderbilt University, 2017- present

Associate Professor, Department of Chemistry (secondary appointment), Vanderbilt University, 2017- present

Adjunct Associate Professor, Neuroscience and Pharmacology, Meharry Medical College, 2017-present

## Employment

Research Investigator I, Neuroscience Drug Discovery, Bristol-Myers Squibb, 1997-1998

Research Investigator II, Neuroscience Drug Discovery, 1998-1999

Senior Research Investigator I, Lead Discovery, Bristol-Myers Squibb, 1999-2001

Senior Research Investigator II, Lead Discovery, Bristol-Myers Squibb, 2001-2003

President and Founder, WaveFront Biosciences, 2011-present

President and co-CEO, Ion Indicators, 2019- present

### **Professional Organizations**

Society for Laboratory Automation and Screening

American Society for Pharmacology and Experimental Therapeutics

Society for Neuroscience

American Chemical Society

American Association for the Advancement of Science

### **Professional Activities**

#### **Intramural**

Director, Vanderbilt Institute of Chemical Biology High-throughput Screening Facility, 2005-2011

Director, Molecular Pharmacology, Vanderbilt Program in Drug Discovery, 2005-2010

Director, National Institutes of Health Molecular Libraries Screening Center for GPCRs, Ion Channels and Transporters, 2005-2008

Scientific Director, Vanderbilt Institute of Chemical Biology High-throughput Screening Facility, 2011-present

Quantitative Chemical Biology Program Admissions Committee, 2015-present

Vanderbilt University Conflicts Committee, Representative for the Basic Sciences, 2016-present

Vanderbilt University Discovery Grant study section, 2017 - present

Co-director Chemical Biology Interface training grant, 2017-present

Associate Director, Vanderbilt Institute of Chemical Biology, 2017-present

#### **Extramural**

External Advisory Committee, Biochemistry, Cellular and Molecular Biology, University of Tennessee, 1998-2000

Senior Leadership Team, New Leads Biology, Bristol-Myers Squibb Pharmaceutical Research Institute, 2000-2002

Editorial Board, Assay and Drug Development Technologies, 2004-present

External Advisory Group, NIH Psychoactive Drug Screening Program, 2009-2013

External Advisory Group, Velocity 11 (an Agilent company), 2008-2012

External Scientific Advisory Board, Moffitt Cancer Center Drug Discovery, 2010

Ad hoc reviewer, 2005-present: Molecular Pharmacology, ACS Chemical Neuroscience, Journal of Medicinal Chemistry, Society for Biomolecular Screening, Scientific Reports, Neuropharmacology

Ad hoc study sections, National Institutes of Health, 2005-present: Drug Discovery for the Central Nervous System, Male Contraceptive Development Program, Adjuvant Discovery Program, Transformative Research Award, Drug Discovery SBIR Program, High-throughput Screening Special Emphasis Panel

### **Awards and Recognition**

Fred Roddy Scholarship, 1987

Phi Beta Kappa Honor Society, 1988

Ed Hawkins Memorial Scholarship, 1988

Top graduate in the College of Liberal Arts (Natural Sciences), 1989

Chancellor's Citation for Academic Excellence, 1989

Hilton Smith Graduate Fellowship, 1989

Alexander Hollaender Graduate Fellowship, 1991-1992

Chancellor's Citation for Professional Promise, 1994

Bristol-Myers Squibb Pharmaceutical Research Institute President's Award, 2000

Bristol-Myers Squibb Pharmaceutical Research Institute Pill Head Award for Scientific Innovation, 2000

Bristol-Myers Squibb Pharmaceutical Research Collaboration Award, 2004

Best Poster in Session, Society for Biomolecular Screening Annual Meeting "Screening for Potassium Channel Modulators Using FLIPR-based Thallium Flux", 2004

Best Poster in Session, Society for Biomolecular Screening Annual Meeting "Discovery of Novel Allosteric Modulators of Metabotropic Glutamate Receptor 8 (mGluR8) using GIRK-mediated Thallium Flux Modulation in High Throughput Screening", 2008

Vanderbilt Chancellor's Faculty Fellow, 2018

### **Teaching Activities**

#### **Undergraduate**

Chemistry Capstone Course, Lecturer, 2006

Research Experience for Undergraduates (REU) Program, Lecturer and mentor, 2007-present

#### **Graduate**

Modern Drug Discovery, Co-director, 2007-2010, Lecturer, 2007-present, 3-5 hours contact time/year

Biomedical Engineering Laboratory Automation, Lecturer, 2011 – 2015, 2 hours contact time/year

Foundations of Chemical Biology, Lecturer, 2013-2014, 2 hours contact time/year

HTS and Drug Discovery, University of Kentucky, Lecturer, 2013, 1 hour contact time

Receptors, Lecturer 2014-2015, 2 hours contact time/year

Survey of Chemical, Physical, and Biophysical Techniques and Their Applications, 2014-present, 2 hours contact time/year

Chemical Biology Interface Training Grant, Co-director, 2016-present

Short course in High-throughput Screening and Drug Discovery, Leipzig University, Co-director and Lecturer, 2016, 6 hours contact time

Nuro 8345, 2018, 1 hour contact time

### **Research Supervision**

#### **Post-graduate**

Krystian Kozek, Pharmacology (MSTP),

Kristopher Abney, Pharmacology (Meharry Medical College)

Francis Prael, Pharmacology (IGP)

Susan Ramos Hunter, (primary co-mentor Gary Sulikowski, Department of Chemistry) – presently post-doctoral fellow at Pacific Northwest National Laboratories

Mario Schubert, visiting student, (primary mentor Annette Beck-Sickinger, University of Leipzig)

Brittany Spitznagel (Pharm.D.), Pharmacology (direct admit)

#### **Post-doctoral**

Suzanne Brady, ITTD Program, (co-mentor with Dan Beauchamp, Department of Surgery), Project Manager, Bend Research, Bend, OR

Krystian Kaufmann, Pharmacology, Senior Engineer, Vimeo, New York, NY

Jan Stichel, visiting fellow, (primary mentor Annette Beck-Sickinger, University of Leipzig)

Brendan Dutter, Pharmacology

#### **Thesis Committees**

Jana Shirey (Pharmacology), Jeremy Wilburn (Chemistry), Ralph Mueller (Chemistry), Sameer Sharma (Chemical and Physical Biology), Rebecca Sandlin (Chemistry), Craig Goodwin (Biochemistry), Greg Sliwoski (Pharmacology, master's degree), Rene Raphemot (Pharmacology), Mario Schubert (Leipzig University, master's degree), Kevin Kumar (Neuroscience), Susan Ramos-Hunter (Chemistry), Derrick Cumberbatch (Biology), Alexis Wong (Chemistry), Kyle Horning (Neuroscience), Aparna Shekar (Pharmacology), Mike Litt (Molecular Physiology and Biophysics), Caleigh Azumaya (Molecular Physiology and Biophysics), Clayton Wandishin (CPB), Shan Parikh

(Pharmacology), Rachel Fischer (Pharmacology) Rachel Crouch (Pharmacology), Danyea Heckard (Meharry), Eric Figueroa (Pharmacology), Mabel Seto (Pharmacology), Chris Hoffmann (Pharmacology), Matt Wleklinski

## Research Program

### Completed

1. Calcium Flux Properties of Glutamate Receptor Subtypes. 1 F32 NS09788-01 (CD Weaver, PI) 1994-1996. Role: PI, 12 calendar months.
2. Ionotropic Glutamate Receptors in Pancreatic Islets of Langerhans. Juvenile Diabetes Foundation International Fellowship 396164 (CD Weaver, PI) 1996-1997. Role: PI, 12 calendar months.
3. Allosteric potentiators of mGluR5 as a novel approach for the treatment of Schizophrenia. NARSAD (PJ Conn, PI) \$185,184. 2004-2005. Role: co-investigator, 1.2 calendar months.
4. Allosteric potentiators of mGluR5 as a novel approach for the treatment of Schizophrenia. SMRI Research Grants Program (P.J. Conn, PI) \$195,651. 2004-2006. Role: co-investigator, 1.2 calendar months.
5. Development of a High Throughput Assay for Allosteric Potentiators of mGluR4. NIH R21 (PJ Conn, PI) \$150,000. 2004-2006. Role: co-investigator, 1.2 calendar months.
6. Screening of a Large Chemical Library for Inhibitors of PI3K Signaling. NCI 5P50 CA098131-02 (C Artega, PI). \$50,000. 2005-2006. Role: co-investigator, 1.2 calendar months.
7. A Direct Assay for HTS of G<sub>i/o</sub>-linked GPCRs: mGluR7 as the Prototype. NINDS R21 NS053536 (C Niswender, PI) \$150,000. 2005-2006. Role: co-investigator, 0.6 calendar months.
8. Identification of Novel Modulators of Cl-dependent Transport Processes via HTS. NIH/NINDS R21 NS053658 (E Delpire, PI) \$148,750. 2005-2006. Role: co-investigator, 1.2 calendar months.
9. A Chemical Genetic Screen for Modifiers of Presynaptic Choline Transport. Alzheimer's Association ZEN-04-1001 (R Blakely, PI) \$337,500. 2004-2006. Role: co-Investigator, 0.6 calendar months.
10. Muscarinic receptor activators as novel antipsychotic agents. NIH/NIMH RO1 MH073676 (PJ Conn, PI) \$637,500. 2004-2006. Role: co-investigator, 1.2 calendar months.
11. mGluR4 Potentiators as a Treatment for Parkinson's disease Supports an HTS effort to discovery novel activators of mGluR4. NIH/NINDS R21 NS051342 (PJ Conn, PI) \$229,167. 2005-2006. Role: co-investigator, 1.2 calendar months.
12. Measurement of GPCR-Mediated thallium flux through GIRK. NIH/NIMH R03 MH076398 (C Niswender, PI) 2005-2006. \$3000. Role: co-Investigator, 0.3 calendar months, no salary
13. An MLSCN Screening Center for GPCRs, Ion Channels, and Transporters. NIH/NIMH U54 MH074427 (CD Weaver, PI) \$4,511,802. 2005-2008. Role: PI, 3 calendar months.
14. Identification of Novel Modulators of ROMK K<sup>+</sup> Channel Activity. NIH/NINDS R21 NS057041-01 (J Denton, PI) \$150,000. 2006-2007. Role: co-investigator, 0.3 calendar months.
15. mGluR4 Potentiators as a Treatment for Parkinson's disease. NIH/NINDS R21 NS051342 (PJ Conn, PI) \$229,167. 2006-2007. Role: co-investigator, 1.2 calendar months.
16. Therapeutic Discovery for Obesity. Culpepper Foundation 4043516372 (K Niswender, PI) \$100,000. 2006-2009. Role: co-investigator, 0.6 calendar months.
17. Lipid Peroxidation and Antioxidant Mechanisms. NIH/EHS (N Porter, PI) \$1,041,817. 2007-2008. Role: core director, 0.6 calendar months.
18. GLP-1 PAMs for the treatment of Diabetes and Obesity. VICB Pilot Program (CD Weaver, PI) \$50,000. 2007. Role: PI, no salary.
19. Muscarinic Receptor Activators as Antipsychotic Agents. NIH/NIMH RO1 MH073676-02 (PJ Conn, PI) \$1,062,500. 2006-2010. Role: co-investigator, 1.2 calendar months.

20. Screening for chronotherapeutics applied to hypersomnia and other sleep disorders. NIH/NINDS R21 NS054991 (C Johnson, PI) \$229,167. 2007-2010. Role: co-investigator, 0.24 calendar months.
21. NCI-SPORE in GI Cancer. NIH/NCI P50 CA095103 (R Coffey Jr, PI) \$7,561,330. 2007-2012. Role: Core Director, 0.86 calendar months.
22. Novel strategies for treatment of Fragile X syndrome. Seaside Therapeutics VUMC33842 (PJ Conn, PI) \$2,931,597. 2007-2012. Role: co-Investigator, 0.96 calendar months.
23. Discovery of novel allosteric modulators of mGluR4 for treatment of Parkinson's disease. Michael J. Fox Foundation, LEAPS Award, P. Jeffrey (PJ Conn, PI) \$4,446,175. 2007-2011. Role: co-Investigator, co-director molecular pharmacology, 2.4 calendar months.
24. Partial antagonists of mGluR5 for treatment of cocaine addiction. NIH/NIDA R01 DA023947 (C Lindsley, PI) \$1,394,995. 2008-2013. Role: co-investigator, 0.6 calendar months.
25. Selective M1 mAChR allosteric modulators for the treatment of schizophrenia. NIH/NIMH R01 MH082867 (C Lindsley, PI) \$1,125,000. 2008-2013. Role: co-investigator, 0.6 calendar months.
26. CBC-Vanderbilt Chemical Diversity Center-Task One. SAIC-Federick 29SZ129T01 (G Sulikowski, PI) \$35,693. 2009-2011. Role: co-investigator, 0.12 calendar months.
27. Johnson and Johnson industry-sponsored contract. Johnson and Johnson VUMC34998 (PJ Conn, PI) \$3,257,329. 2009-2011. Role: co-investigator, 0.2 calendar months.
28. The Vanderbilt Molecular Target and Discovery Center. NIH/NCI 5RC2 CA148375-02 (LJ Marnett, PI) \$4,394,928. 2009 – 2011. Role: core director, 1.35 calendar months.
29. Vanderbilt NCDDDG for Discovery of Novel Treatments for Schizophrenia U01 MH087965 (Conn PJ, PI) \$2,500,000. 2009-2014. Role: co-PI, director of molecular pharmacology, 3.36 calendar months.
30. Chemical Probes for astroglial potassium channel Kir4.1. NIH 1R21 NS073097-01 (J Denton, PI) \$229,167. 2010-2011. Role: co-investigator, 0.6 calendar months.
31. Discovery of novel modulators of NPY4 receptor. VICB Pilot Program (CD Weaver and Jens Meiler, co-PIs) \$40,000. 2011. Role: co-PI, no salary.
32. Identification of novel small molecule inhibitors selective against a major drug resistance mutation in lung cancer. V. Foundation (W Pao, PI) \$545,454. 2009-2012. Role: co-investigator, 0.6 calendar months.
33. An HTS-compatible Assay to Probe Muscarinic Receptor Modulation of the M-current. NIH/NINDS R21 NS74074 (CD Weaver, PI) \$229,167. 2011-2012. Role: PI, 1.2 calendar months.
34. HTS discovery of chemicals that induce kidney failure in the malarial vector *Anopheles gambiae*. Foundation for the National Institutes of Health GRT00024873 (J Denton) \$527,990. 2011-2012. Role: co-investigator, .60 calendar months.
35. Development of Subtype-specific Positive and Negative Modulators of the GIRK family of Potassium Channels. NIH/NIMH R03 MH076398 (CD Weaver, PI) \$3,000. Role: PI, no salary.
36. Small Molecule Modulators of the Y4 Receptor for Treatment of Obesity. Vanderbilt Diabetes Research and Training Center (J Meiler and CD Weaver, co-PI) \$50,000. 2011-2012. Role: co-PI, no salary.
37. GLP-1 receptor modulators for diabetes and obesity. American Diabetes Association ADA 1-10-BS-134 (K Niswender, PI) \$180,000. 2011-2012. Role: co-investigator, 0.6 calendar months.
38. High-throughput discovery of chemicals that induce kidney failure in the malarial vector *Anopheles gambiae*. VUMC# 38718, OSU Subcontract (J Denton) \$270,636. 2011-2013. Role: co-investigator, 0.6 calendar months.

39. Vanderbilt Specialized Chemistry Center for Accelerated Probe Development. NIH/NIMH U54 MH084659 (C Lindsley, PI) \$9,618,765. 2008-2014. Role: co-investigator, 0.6 calendar months.
40. Cancer Center Support Grant. NIH/NCI P30 CA068485 (J Pietenpol, PI) \$375,000. 2010-2015. Role: core director, 0.6 calendar months.
41. Ensemble Docking Interrogates Structural Determinants of Ligand-Protein Interactions. NSF CHE-1305874 (J Meiler, PI) 2013-2015. \$308,337. Role: co-investigator, 0.46 calendar months.
42. Small Molecule Probes to Investigate Structure and Function of Y Receptors. NIH/NIDDK R01 DK097376 (J. Meiler, D. Weaver, co-PIs) \$737,331. 2013-2016. Role: Co-PI, 1 calendar month.
43. Screening for allosteric modulators of the protease activated receptor 4. NIH/NIHLB R01NS082198 (H Hamm, PI) \$656,250. 2013-2016. Role: co-investigator, 2.4 calendar months.
44. A High-throughput Screen to Discover Novel Modulators of the GIRK2/3 Potassium Channel. NIH/NIMH R21 MH099363 (D Weaver, PI) \$229,167. 2014-2016. Role: PI, 3 calendar months.
45. Identifying molecules that modulate auxiliary factors of AMPA receptors. NIH/NIMH R21 MH102546 (T Nakagawa, PI) \$229,167. 2014-2016. Role: co-investigator, 0.24 calendar months.

#### Active

1. Development of an *in vivo*, brain-penetrant GIRK1/2 Potassium Channel Activator. NIH/NIMH 1R01MH107399-01 (CD Weaver, PI; C Hopkins and K Wickman, co-PIs) \$1255928. 2015-2017. Role: Co-PI (contact PI), 3 calendar months.
2. Development of the First Cell Type and Subcellular Domain-selective Fluorescent Thallium Sensors for Basic and Drug Discovery Research of Potassium Channels. Vanderbilt Discovery Grant (CD Weaver, G Sulikowski co-PIs) \$100,000. 2016-2017. Role: contact PI, no salary.

#### Publications and Presentations

##### Peer-reviewed Publications

1. Roberts DM, Oh SH, Besl L, Weaver CD and Stacey G. (1990) Attenuation of calmodulin-dependent NAD kinase by posttranslational calmodulin methylation. *Current Topics in Plant Biochemistry and Physiology*. 9:67-84.
2. Roberts DM and Weaver CD (1990) How plants respond to stimuli. *New Biologist*. 2:678-683. PMID: 2282367
3. Weaver CD, Crombie B, Stacey G, and Roberts DM (1991) Calcium-dependent phosphorylation of symbiosome membrane proteins from nitrogen-fixing root nodules: evidence for the phosphorylation of nodulin 26. *Plant Physiol*. 95:222-227. PMID: 16667955
4. Ouyang LJ, Whelan J, Weaver CD, Roberts DM, and Day DA. (1991) Protein phosphorylation stimulates the rate of malate uptake across the peribacteroid membrane of soybean nodules. *FEBS Lett*. 293:188-190. PMID: 1959659
5. Weaver CD and Roberts DM. (1992) Determination of the site of phosphorylation of nodulin 26 by the calcium-dependent protein kinase from soybean nodules. *Biochemistry*. 31:8954-8959. PMID: 1390682
6. Nichols R, Weaver CD, Eisenstein E, Huang TH, Huang FY, and Howell EE. (1993) Titration of histidine 62 in R67 dihydrofolate reductase is linked to a tetramer  $\rightleftharpoons$  2 dimer equilibrium. *Biochemistry*. 32:1695-1706. PMID: 8439535

7. Weaver CD, Shomer NH, Louis CF, and Roberts DM. (1994) Nodulin 26, a nodule-specific symbiosome membrane protein from soybean, is an ion channel. *J. Biol. Chem.* 269:17858-17862. PMID: 7517934
8. Lee JW, Zhang Y, Weaver CD, Shomer NH, Louis CF, and Roberts DM. (1995) Phosphorylation of reconstituted, recombinant nodulin 26 by calmodulin-like domain protein kinase affects voltage-sensitive channel activity in planar lipid bilayers. *J. Biol. Chem.* 270:27051-27057. PMID: 7592955
9. Weaver CD, Yao TL, Powers AC, and Verdoorn TA. (1996) Differential expression of glutamate receptor subtypes in rat pancreatic islets. *J. Biol. Chem.* 271:12977-12984. PMID: 8662728
10. Weaver CD, Gundersen V, and Verdoorn TA. (1998) Glucose modulates high-affinity glutamate transport activity in rat pancreatic islets of Langerhans. *J. Biol. Chem.* 273:1647-1653. PMID: 9430708
11. Weaver CD, Partridge JG, Yao TL, Moates JM, Magnuson MA, and Verdoorn TA. (1998) Activation of glycine and glutamate receptors increases intracellular calcium in cells derived from the endocrine pancreas. *Mol Pharmacol.* 54: 639-646. PMID: 9765506
12. Wu YJ, Boissard C, Digavalli S, Greco C, Gribkoff VK, Harden DG, He H, Kang SH, Kinney G, Knox R, Lehtinen-Oboma S, Natale J, Newton AE, Polson C, Sinz MW, Starrett JE, Sun LQ, Tertysnikova S, Thompson MP, Weaver CD, Wong HS, Zhang L, and Dworetzky SI. (2003)(S)-N-[1-(3-Morpholin-4-yl-phenyl)-ethyl]-3-phenyl-acrylamide: an Orally Bioavailable KCNQ2 Opener with Activity in the Cortical Spreading Depression Model. *J. Med. Chem.* 46(15):3197-200. PMID: 12852750
13. Wu YJ, Davis CD, He H, Sun Q, Zoeckler M, Digavalli SV, Newton AE, Dworetzky S, Yeola S, Philip T, Knox RJ, Fitzpatrick W, Weaver CD, Harden D, Tertysnikova S, Polson C, Lentz K, Sin MW. (2003) Fluorine Substitution Can Block CYP3A4 Metabolism Dependent Inhibition: Identification of (S)-N-[1-(4-Fluoro-3-morpholin-4-yl-phenyl)-ethyl]-3-(4-fluoro-phenyl)-acrylamide as an Orally Bioavailable KCNQ2 Opener Devoid of CYP3A4-Metabolism Dependent Inhibition. *J. Med. Chem.* 46(18):3778-81. PMID: 12930139
14. Faria TN, Timoszyk JK, Stouch, TR, Balvinder SV, Amidon GL, Weaver CD, Wall DA, Smith RL. (2004) A Novel High Throughput Pept1 Transporter Assay Differentiates Between Substrates and Antagonists. *Mol. Pharm.* 1(1):67-76. PMID: 15832502
15. Wu YJ, Boissard CG, Chen J, Fitzpatrick W, Gao Q, Gribkoff VK, Harden DG, He H, Knox RJ, Natale J, Pieschl RL, Starrett JE Jr, Sun LQ, Thompson M, Weaver D, Wu D, Dworetzky SI. (2004)(S)-N-[1-(4-cyclopropylmethyl-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl)-ethyl]-3-(2-fluoro-phenyl)-acrylamide is a potent and efficacious KCNQ2 opener which inhibits induced hyperexcitability of rat hippocampal neurons. *Bioorg. Med. Chem. Lett.* 14(8):1991-5. PMID: 15050644
16. Wu YJ, Sun LQ, He H, Chen J, Starrett JE Jr, Dextraze P, Daris JP, Boissard CG, Pieschl RL, Gribkoff VK, Natale J, Knox RJ, Harden DG, Thompson MW, Fitzpatrick W, Weaver D, Wu D, Gao Q, Dworetzky SI (2004) Synthesis and KCNQ2 opener activity of N-(1-benzo[1,3]dioxol-5-yl-ethyl, N-[1-(2,3-dihydro-benzofuran-5-yl)-ethyl], and N-[1-(2,3-dihydro-1H-indol-5-yl)-ethyl acrylamides. *Bioorg. Med. Chem. Lett.* 14(17):4533-7. PMID: 15357987
17. Weaver CD, Harden D, Dworetzky SI, Robertson B, Knox RJ. (2004) A Thallium-sensitive, Fluorescence-based Assay for Detecting and Characterizing Potassium Channel Modulators in Mammalian Cells. *J. Biomol. Screen.* 9(8):671-677. PMID: 15634793
18. Tertysnikova S, Knox RJ, Plym MJ, Neelands T, Thalody G, Greco C, Harden D, Signor L, Weaver CD, Myers R, Lodge NJ. (2005) BL-1249, A novel bladder-selective potassium channel opener: in vitro and in vivo characterization. *J. Pharmacol. Exp. Ther.* 313(1):250-9. PMID: 15608074



19. L'Heureux A, Martel A, He H, Chen J, Sun LQ, Starrett JE, Natale J, Dworetzky SI, Knox RJ, Harden DG, Weaver CD, Thompson MW, Wu YJ. (2005) (S,E)-N-[1-(3-heteroarylphenyl)ethyl]-3-(2-fluorophenyl)acrylamides: synthesis and KCNQ2 potassium channel opener activity. *Bioorg. Med. Chem. Lett.* 15(2):363-6. PMID: 15603955
20. Lindsley CW, Weaver D, Jones C, Marnett L, Conn PJ. (2007) Preclinical drug discovery research and training at Vanderbilt. *ACS Chem. Biol.* 2(1):17-20. PMID: 17243778
21. Shirey JS, Xiang Z, Orton D, Brady AE, Myers-Johnson KA, Williams R, Ayala JE, Rodriguez AL, Wess J, Weaver CD, Niswender CM, Conn PJ. (2007) Discovery of novel selective allosteric potentiators of the M4 mAChR suggests a role in modulating excitatory but not inhibitory synaptic transmission in the hippocampus. *Nature Chemical Biology. Nat. Chem. Biol.* 4(1):42-50. PMID: 18059262
22. Lewis LM, Sheffler D, Williams R, Bridges TA, Brogan JT, Kennedy JP, Mulder MJ, Williams L, Nalywajko NT, Niswender C, Weaver CD, Conn PJ, Lindsley CW. (2008) Synthesis and SAR of selective muscarinic acetylcholine receptor subtype 1 (M1 mAChR) antagonists *Bioorg. Med. Chem. Lett.* 1;18(3):885-90. PMID: 18178088
23. Niswender CM, Myers KA, Lou Q, Ayala J, Kim C, Conn PJ, Weaver CD. (2008) Development of a Novel and Direct Assay for High-Throughput Screening of Gi/o-linked GPCRs using Thallium Flux Through GIRK Channels. *Mol. Pharmacol.* 73(4):1213-24. PMID: 18171729
24. Kennedy JP, Williams L, Bridges TM, Daniels RN, Weaver D, Lindsley CW. (2008) Application of Combinatorial Chemistry Science on Modern Drug Discovery. *J. Comb. Chem.* 10(3):345-54. PMID: 18220367
25. Niswender CM, Johnson KA, Weaver CD, Jones CK, Luo Q, Rodriguez AL, Marlo JE, de Paulis T, Thompson AD, Days EL, Nalywajko T, Austin CA, Williams MB, Ayala JE, Williams R, Lindsley CW, Conn PJ. (2008) Discovery, characterization, and antiparkinsonian effect of novel positive allosteric modulators of metabotropic glutamate receptor 4. *Mol. Pharmacol.* 74(5):1345-88. PMID: 18664603
26. Gentles RG, Hu S, Huang Y, Grant-Young K, Poss MA, Andres C, Fiedler T, Knox R, Lodge N, Weaver CD, Harden DG. (2008) Preliminary SAR studies on non-apamin-displacing 4-(aminomethylaryl)pyrazolopyrimidine K(Ca) channel blockers. *Bioorg. Med. Chem. Lett.* 18(20):5694-7 PMID: 18824351
27. Gentles RG, Grant-Young K, Hu S, Huang Y, Poss MA, Andres C, Fiedler T, Knox R, Lodge N, Weaver CD, Harden DG. (2008) Initial SAR studies on apamin-displacing 2-aminothiazole blockers of calcium-activated small conductance potassium channels. *Bioorg. Med. Chem. Lett.* 18(19):5316-9. PMID: 18774291
28. Aldrich LN, Lebois EP, Lewis LM, Nalywajko NT, Niswender CM, Weaver CD, Conn PJ, Lindsley CW. (2009) MAOS Is for the general synthesis and lead optimization of 3,6-disubstituted-[1,2,4]triazolo[4,3-b]pyridazines. *Tetrahedron Lett.* 50(2):212-215. PMID: 22090663
29. Marlo JE, Niswender CM, Days EL, Bridges TM, Xiang Y, Rodriguez AL, Shirey JK, Brady AE, Nalywajko T, Luo Q, Austin CA, Williams MB, Kim K, Williams R, Orton D, Brown HA, Lindsley CW, Weaver CD, Conn PJ. (2009) Discovery and characterization of novel allosteric potentiators of M1 muscarinic receptors reveals multiple modes of activity. *Mol. Pharmacol.* 75(3):577-88. PMID: 19047481
30. Delpire EJ, Days E, Lewis M, Mi D, Lindsley C, Weaver CD. (2009) Small Molecule Screen Identifies Novel Inhibitors of the Neuronal K-Cl cotransporter KCC2. *Proc. Natl. Acad. Sci. USA.* 106(13):5383-8. PMID: 19279215
31. Sheffler DJ, Williams R, Bridges TM, Xiang Z, Kane AS, Byun NE, Jadhav S, Mock MM, Zheng F, Lewis LM, Jones CK, Niswender CM, Weaver CD, Lindsley CW, and Conn PJ. (2009) Novel Selective Muscarinic Acetylcholine Receptor Subtype 1 (M1 mAChR) Antagonist Reduces

- Seizures Without Impairing Hippocampal-Dependent Learning. *Mol. Pharmacol.* 76(2):356-68. PMID: 19407080
32. Bridges TM, Marlo JE, Niswender CM, Jones CK, Jadhav SB, Gentry PR, Plumley HC, Weaver CD, Conn PJ, Lindsley CW. (2009) Discovery of the First Highly M5-Preferring Muscarinic Acetylcholine Receptor Ligand, an M5 Positive Allosteric Modulator Derived from a Series of 5-Trifluoromethoxy N-Benzyl Isatins *J. Med. Chem.* 52(11):3445-8. PMID: 19438238
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5. Ion Channel Drug Discovery: Where Luck and the Prepared Mind Meet the Devil and the Details. Amgen, 2003, Thousand Oaks, CA (invited)
6. High-throughput Tool Discovery for Membrane Proteins. Membrane Biology Seminar, 2004, Vanderbilt University, Nashville, TN (invited)
7. Ion Channel and Transporter Screening at Vanderbilt University. University of Mississippi, National Center for Natural Products Research, 2005, Oxford, MS (invited)
8. Ion Channels: Screening Approaches: Past, Present, and Future. Hamamatsu Central Research, 2005, Hamamatsu, Japan
9. The Vanderbilt Screening Facility: Technology-enabled Discovery. University of Missouri, Biochemistry Seminar Series, 2006, Columbia, MO (invited)
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11. The Vanderbilt Program in Drug Discovery: A Hybrid Academic/Industrial Approach. North Eastern Chapter American Chemical Society, 2007, Woburn, MA (invited)
12. In Search of a Selective M1 Antagonist: the improbable dream. Vanderbilt Institute of Chemical Biology seminar series, 2007, Nashville, TN (invited)
13. Kinetic Fluorescence Assays for GPCRs, Ion Channels, and Transporters. Society for Biomolecular Sciences (satellite meeting), St. Louis, MS (invited)
14. The Vanderbilt Screening Facility: Technology-enabled Discovery. Invitrogen/Molecular Probes, 2008, Eugene, OR (invited)
15. Discovery and Development of Centrally Active and Highly Selective M1 Antagonists. International Narcotics Research Conference, 2008, Charleston, SC (invited)
16. Carrying Fire: Bringing Chemical Tool Discovery to the Academy. University of Tennessee Interdisciplinary Graduate Program Retreat, 2008, Knoxville, TN (invited, keynote speaker)
17. Frontiers in Laboratory Automation: The Emergence and Expansion of Academic Screening Centers. Velocity 11 Annual User's Group Meeting, 2008, Barcelona, Spain (invited)
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19. Detecting and Characterizing 7TM Receptor Modulators. World Pharma Congress, 2010, Philadelphia, PA (invited)
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25. How Heavy Metal Changed my Life TEFlabs. 2011, Austin, TX (invited)
26. Cell-based Kinetic Assay Technologies for Drug Discovery and Basic Research: Moving beyond the Industrial Mindset. Vanderbilt University Department of Biomedical Engineering, Seminar Series, 2011, Nashville, TN (invited)
27. Gold is Where You Find It: Discovery and Characterization of the First Small-molecule GIRK Activators. Society of General Physiologist, Woods Hole Oceanographic Institute, 2012, Woods Hole, MA (invited)
28. Excited to Death: Resetting the Clock on Insecticide Resistance. Vanderbilt Institute for Global Health, 2013, Nashville, TN (invited)
29. Gold is Where You Find It: Discovery and Characterization of the First Small-molecule GIRK Activators. University of Kentucky College of Pharmacy Seminar Series, 2013, Lexington, KY (invited)
30. High-throughput Screening for Y4R: An Assumption and an Admission. DRTC Seminar Series, 2014, Nashville, TN (invited)
31. Small Molecule Probes to Investigate the G-protein-activated Inward Rectifying Potassium Channel (GIRK). University of Bonn, Invited Lecture, 2014, Bonn, Germany (invited)
32. Discovery of Allosteric Modulators of G-protein-gated Inward Rectifying Potassium (GIRK) Channels. Vanderbilt University Department of Pharmacology, 2016, Nashville, TN (student-invited seminar)
33. Discovery of Allosteric Modulators of G-protein-gated Inward Rectifying Potassium (GIRK) Channels. NIAAA, Invited Seminar, 2016, Washington DC (invited)
34. Unconventional: Careers in the Pharmaceutical Industry, Academia, and Small Business. NIGMS (PRAT), 2016, Washington DC (trainee-invited career workshop)