

## Owen Michael McDougal, Ph.D.

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### **EDUCATION**

- 1998 Ph.D. Organic Chemistry, University of Utah, Salt Lake City, UT. Ph.D. Dissertation: *Conus Peptides Investigated by Nuclear Magnetic Resonance Spectroscopic Methods*. Advisor: C. Dale Poulter.
- 1992 B.S. Chemistry/Spanish minor, State University of New York College (SUNY) Oswego, NY.
- 1990 A.S. Chemistry, SUNY Morrisville, NY.

### **PROFESSIONAL POSITIONS**

#### **Leadership Experience**

- 2016-present Chair, Department of Chemistry and Biochemistry, Boise State University. **Position Roles and Responsibilities:** The Department Chair provides oversight of 38 full time employees, manages an operational and research budget in excess of \$3.8 million dollars, shepherds a curriculum serving over 3,000 students per semester, provides leadership, strategic planning and plan execution, makes hiring, coaching, training, and firing decisions, provides oversight of coordinators and managers, conflict resolution, negotiation with the administration to secure assets to grow the undergraduate and Masters programs in chemistry, and serves as the point of contact for interdisciplinary Ph.D. programs in Biomolecular Sciences, Materials Science, and Computer Science. Signature programs include 5-year strategic plan, mission statement and vision document, employee of the month program, and nomination campaign for exceptional employees.
- 2016 Project Kaleidoscope (PKAL) Summer Leadership Institute, Bishop Claggett Center, Adamstown, MD. Training was aimed at establishing a network of STEM professionals in leadership positions. Each participant received a mentor to provide long-term coaching in leadership decision making. My mentor is Dr. Yvonne Harris, Vice President for Research at James Madison University; we teleconference monthly.
- 2015-2016 Associate Chair, Department of Chemistry and Biochemistry, Boise State University. My role as the associate chair was to complement the work effort of the department chair to resolve student and personnel issues, address budget matters, evaluate personnel performance, prioritize space allocation, and plan for future growth of the program. **Position Roles and Responsibilities:** I set out to establish analytical services for area industry to vet the viability of outside the box funding mechanisms that may support the department into the future. I assumed lead responsibilities as the department liaison between industry and university to resolve issues of contracts, work for hire, instrumentation performance, budgets, reporting, presentations, fund raising, and sustainability.

- 2013-present Founding Editor in Chief, American Institute of Mathematical Sciences (AIMS) Molecular Science journal. AIMS Molecular Science is an international Open Access journal devoted to publishing peer-reviewed, high quality, original papers in the field of molecular science. The journal publishes original research articles, reviews, editorials, letters, and conference reports. **Position Roles and Responsibilities:** Identify outstanding scientists to serve as Senior Editors by providing oversight for each division, and assemble teams of Associate Editors with a wide range of knowledge within their division. Timely publication of each edition, peer-review, and a commitment to excellence in publishing are among the main duties of the Founding Editor in Chief.
- 2012 & 2014 Chair Elect, American Chemical Society Snake River Local Section. **Position Roles and Responsibilities:** Organize an annual meeting of the section, arrange for the keynote speaker, coordinate awards for outstanding high school chemistry teachers, and encourage student activities and participation in science events
- 2012-2014 President-Elect 2012, President 2013, and Past-President 2014, American Association for the Advancement of Science Pacific Division. **Position Roles and Responsibilities:** Preside over the annual meeting of the Executive Committee, coordinate with program planners, present the key note address, and preside over both the Executive Committee and Council meetings at the annual scientific conference. Chair of the Executive Director hiring committee (2013). Chair of the President-Elect Nominating committee (2014).
- 2007 & 2012 Program Chair, American Association for the Advancement of Sciences Pacific Division annual meeting, Boise, ID. **Position Roles and Responsibilities:** Worked closely with colleagues from math and sciences, engineering, public policy, and many other academic and administrative departments at Boise State and across the Pacific Northwest to provide a robust collection of symposia, workshops, and public lectures. Solid team building, networking, and communication skills were required to make the meeting a success.
- 2009-2011 Faculty Senate President, Boise State University, Boise, ID. **Position Roles and Responsibilities:** I attended and presented at Idaho State Board of Education (SBOE) meetings, met regularly with the BSU president, provost and VP for Academic Affairs, VP for Finance and Administration (F&A), VP for General Counsel, presented at Dean's Council, networked regularly with Senate Chairs from Univ. of Idaho, Idaho State Univ., and Lewis and Clark State College, met with presidents of professional and classified staff, orchestrated two senate meetings monthly for two years, assembled agendas & meeting materials, finalized minutes, worked with university committee chairs, served as the point of contact and liaison between faculty and the administration and SBOE, conducted a senate retreat to focus on the faculty constitution, core curriculum, prioritize projects, and disseminated senate actions to the faculty at the end of each semester.
- Achievements as Senate President:** **1) Curriculum changes:** lowered the minimum credits required for graduation from 128 to 120, approved a new core curriculum with an emphasis on learning objectives and assessment of outcomes, exploration of a new academic calendar to improve financial model for instruction, evaluation of new approaches to implement technology in teaching and learning; **2) Governance:** rewrote the faculty constitution to include academic freedom and responsibility, presidential succession, new position definitions, clarification of voting rights, and inclusion of a voting representative on the senate by lecturers, research, and clinical faculty, held an open faculty forum, faculty wide vote, worked with the Office of the President to clarify wording in the faculty approved constitution, and coordinated the effort to develop an institutional financial challenge policy and lobbied to modify Idaho SBOE policy to allow universities to manage their own finances; **3) Faculty Compensation:** served as an advocate to enhance faculty compensation, established the Faculty Incentive Pay

Program with the VP for Research, facilitated the Tuition Dependent Assistance Program and access to the Children's Center for faculty and staff with the VP for F&A and the AVP for Human Resources (HR), worked with the AVPHR to explore the viability of forming a health care consortium for higher education employees, worked with the provost to explore faculty salary increases which led to a recommendation by the Financial Affairs committee for a model to internally fund increases independent of the state; and **4) Service and Training:** Presidential Leadership Academy, administrative search committees for the AVPHR, AVP Instructional Technology, and the provost, and administrative meeting participant including the executive budget, Dean's Council, strategic planning, naming of buildings, and selection of honorary doctorate candidates.

### Academic Positions

2014-present Professor of Chemistry, Boise State University, Boise, ID  
2009-2014 Associate Professor of Chemistry, Boise State University, Boise, ID.  
2006-2009 Assistant Professor of Chemistry, Boise State University, Boise, ID.  
2003-2006 Associate Professor of Chemistry, Southern Oregon University, Ashland, OR.  
1998-2003 Assistant Professor of Chemistry, Southern Oregon University, Ashland, OR.

### Graduate and Undergraduate Assistantships

1992-1993 Teaching Assistant, Survey of Chemistry and Organic laboratory, UofU, SLC, UT.  
1991-1992 Research Fellow in Organic Chemistry, SUNY Oswego, Oswego, NY.  
1991 Research Experiences for Undergraduates, University of Utah, Salt Lake City, UT.

### Professional Development

2018 National Public Radio, invited interview for Idaho Matters with Gemma Gaudette, "*Boise State Researcher Studies Acrylamides in Food.*" Program aired May 25, 2018.  
<http://boisestatepublicradio.org/programs/idaho-matters#stream/0>  
2016-present Chairs Council, Department of Chemistry and Biochemistry representative to the College of Arts and Sciences leadership team at Boise State University.  
2016 Project Kaleidoscope (PKAL) Summer Leadership Institute for STEM Faculty, Nominee and participant, Adamstown, MD.  
2014 Opinion letter, Bonner County Public Defender, back calculation of blood alcohol concentration associated with alleged DUI investigation.  
2013-2014 Sabbatical appointment: Chemotaxonomy investigation of New Zealand *Sophora* spp. in collaboration with Dr. Nigel B. Perry, Director of the Institute for Plant and Food Research Ltd., Department of Chemistry, University of Otago, Dunedin, NZ.  
2013-present Founding Editor in Chief: American Institute of Mathematical Sciences (AIMS) Press: *AIMS Molecular Science*, International Open Access Journal devoted to publishing peer-reviewed, high quality, original papers in the field of Molecular Science  
(<http://aimspress.com/home.jsp?journalID=34>).

- 2013 Independent contractor, The Saylor Foundation's Free Education Initiative, invited expert peer-reviewer for CHEM204: Bioorganic Chemistry.
- 2013 Expert witness, court testimonial of professional opinion regarding the legality of synthetic cannabinoid AM-2201 in Idaho State legislation, Caldwell, ID.
- 2012 Opinion letters regarding the legality of synthetic cannabinoids JWH-018, AM-2201, XLR-11, UR-144, and AM-694 in Utah State legislation.
- 2012 Expert witness, court testimonial of professional opinion regarding legality of synthetic cannabinoid AM-2201 in spice, Pocatello, ID.
- 2012 Program Chair, American Association for the Advancement of Science, Pacific Division (93<sup>rd</sup> annual), and liaison to the American Chemical Society Northwest Region (67<sup>th</sup> annual), co-located meeting, Boise Centre on the Grove, Boise, ID. Co-chaired a half-day DockoMatic homology modeling and molecular docking workshop.
- 2012 Expert witness, court testimonial of professional opinion regarding legality of synthetic cannabinoid AM-2201 in spice, Boise, ID.
- 2004-2005 Sabbatical appointment: Structure elucidation of alpha-conotoxins by nuclear magnetic resonance spectroscopy in collaboration with Dr. C. Dale Poulter, Department of Chemistry, University of Utah, Salt Lake City, UT.

## **GRANTS & CONTRACTS (\$4,335,494 total; \$1,889,909 as PI)**

- 2018 BUILD Dairy, "Identification of Propionibacteria Inhibitors in Swiss Cheese Milk" PI (\$96,750).
- 2018 Porvair Filtration Group, "Filter Contamination Identification by IR and NMR" Contract (\$476).
- 2018 Scentsy, "Fragrance Analysis from Wax Blocks by GC-MS" Contract (\$4,005).
- 2018 BUILD Dairy, "Spectroscopic Measurement of Denatured Protein in Milk" PI (\$12,700).
- 2018 BHS Specialty Chemical Products, "Tank Clean Certification by NMR" Contract (\$270).
- 2018 Idaho State Department of Agriculture, "Fast, Accurate, and Economical Evaluation of Acrylamide Content in Fried Potato Products" PI (\$121,556).
- 2017 NIH R01, "Using Fortilin Inhibitors to Block Atherosclerosis" Co-PI (\$393,000 out of \$1,000,000).
- 2017 BHS Specialty Chemical Products, "Chemical Product Reverse Engineering" (\$3,950) Gift.
- 2017 BHS Specialty Chemical Products, "Product Analysis and Synthesis" (\$4,178) Contract.
- 2017 Department of Chemistry & Biochemistry, Graduate Program Stimulus, "Development of a Novel Bioassay for Nicotinic Acetylcholine Receptors" PI (\$5,000).
- 2017 J. R. Simplot Company, "NIR Monitoring Protocol for Fryer Oil; Phase II" (\$32,000) Gift.
- 2017 8 Feathers Distillery Inc., "Congener Analysis from Whiskey by GC-MS" (\$1,239) Contract.
- 2017 Oregon State University, "Organosulfide Analysis from Onion and Onion Slurry by UPLC-CAD and GC-MS" (\$2,750) Contract.
- 2016 BHS Specialty Chemical Products, "Innovative Surfactant Strategies: Sustainable Recycling and New Manufacturing; Phase II" (\$40,000) Contract.
- 2016 Acutus Medical, "FT-IR Surface Analysis of Medical Devices" (\$266) Contract.
- 2016 Debbie Cornell, "Flux Analysis by Thermogravimetric Analysis" (\$851) Contract

- 2016 NIH Center of Biomedical Research Excellence, pilot grant, “Molecular Probes to Understand the Matrix Biology of Hedgehog Pathway Signaling and Basal Cell Carcinoma” (\$20,000) PI.
- 2015 Department of Homeland Security, Chemical Forensics Program, “Conotoxin Chemical Forensics” (Grant: \$290,000; McDougal portion: \$101,164) PNNL Contract.
- 2015 Emory University and the Center for Disease Control, supply budget to investigate an incidence of *Veratrum* alkaloid poisoning (\$971) Gift.
- 2015 BSU Office of Sponsored Projects and College of Arts and Sciences, Economic Development Initiative, subsidy for a chemistry analytical services laboratory pilot program (\$112,000) PI.
- 2015 Nitro Labs, “Vape Analysis by GC-MS” (\$1,891) Contract.
- 2015 Bodybuilding.com, “Nutraceutical Analysis by Analytical Methods” (\$5,125) Contract.
- 2015 BHS Specialty Chemical Products, “Product Evaluation” (\$6,460) Contract.
- 2014 NIH Center of Biomedical Research Excellence, Method Development grant, “Evaluation of *Veratrum californicum* Alkaloids for Hedgehog Pathway Signal Inhibition and Potential for use as Cancer Drugs” (\$32,037) PI.
- 2014 Idaho State Department of Agriculture, Specialty Crop Block grant, “Food Safety Protocol: Improving Potato Processing” (\$155,735) PI.
- 2014 J. R. Simplot Company, “Near Infrared Monitoring Protocol for Fryer Oil” (\$20,000) Gift.
- 2014 Department of Homeland Security, Chemical Forensics Program, “Conotoxin Chemical Forensics” (Grant: \$290,000; McDougal portion: \$98,019) PNL Contract.
- 2014 Idaho Global Entrepreneurial Mission Grant, “Innovative Surfactant Strategies: Sustainable Recycling and New Manufacturing” (\$265,000) PI.
- 2013 BSU College of Arts and Sciences, international travel grant to present research results at CSIRO, Melbourne Australia (\$2,400) PI.
- 2013 Mountain States Tumor Medical Research Institute, “Sustainably Harvesting Bioactive Medicinal Alkaloids from Idaho *Veratrum californicum*” (\$7,500) PI.
- 2012 Mountain States Tumor Medical Research Institute, “Processing of Medicinal Alkaloids from Idaho *Veratrum californicum*” (\$7,500) PI.
- 2012 BSU Office of Sponsored Projects, Economic Development Initiative, funding for a postdoctoral researcher to work with BHS Specialty Chemical Products (\$61,650) PI.
- 2011 Higher Education Research Council, “Academic Liaison with Industry: Going from Big D Little r to Big D Big R is Good for Idaho” (\$49,600) PI.
- 2011 BSU Office of Sponsored Programs, research assistantship (\$25,000) PI.
- 2011 Sawtooth Biologics Corporation, funds were provided to pursue bioactive alkaloids from *Veratrum californicum*, a.k.a. corn lily (\$2,000) PI.
- 2011 BHS Marketing LLC, “Dissecting Detergents and Cleansers to Reformulate New Green Products” (\$20,900) Contract.
- 2010 QinetiQ North America, “<sup>31</sup>P ssNMR Analysis of Treated Fabrics” (\$50,000) Contract.
- 2010 Boise Technology Inc. Year IV, “NMR Characterization of Chemical Composition in a Mixed Phase System” (\$45,904) Contract.
- 2010 BSU, Designing for Learning Success, “Expanding Organic Chemistry at BSU” (\$20,000) PI.

- 2010 USAMRAA Defense Threat Reduction Agency contract number W81XWH-07-1-0004, “The DNA Safeguard Project” (Grant: \$1,069,525; McDougal portion: \$103,200) Co-PI.
- 2009 NSF MRI Grant No. 0923535: “LC-MS Acquisition at Boise State” (\$676,964) Co-PI.
- 2009 Idaho State Board of Education Technology Incentive Grant Program, “Modernizing Freshman Laboratories Using State-of-the-Art Instrumentation” (\$55,700) PI.
- 2009 MSTMRI grant number 6PR3382000170, “Design, Synthesis, and Biological Testing of Novel and Selective Antagonists of nAChRs.” (\$7,500) PI.
- 2009 NIH Grant #P20 RR016454 from the INBRE Program of the National Center for Research Resources (Grant: \$16,000,000; McDougal portion: \$100,000 est.) Co-PI.
- 2009 Boise Technology Inc. Year III, “NMR Characterization of Chemical Composition in a Mixed Phase System” (\$35,000) Collaborative Contract.
- 2008 USAMRAA Defense Threat Reduction Agency contract number W81XWH-07-1-0004, “The DNA Safeguard Project” (Grant: \$1,069,525; McDougal portion: \$116,728) Co-PI.
- 2008 Pacific Northwest National Laboratory-Environmental Molecular Sciences Laboratory (PNNL-EMSL), “Metabolomics and Proteomics of Bacterial Signaling” (est. \$15,000) PI.
- 2008 Boise Technology Inc. Year II, “NMR Characterization of Chemical Composition in a Mixed Phase System” (\$26,500) Collaborative Contract.
- 2008 MSTMRI, “In Search of a Cure for Parkinson’s: A SAR Study” (\$5,000) PI.
- 2008 Idaho State Board of Education Technology Incentive Grant Program, “Going Green: Environmental, Economic, Efficient Organic Chemistry Lab Curriculum” (\$99,700) PI.
- 2007 Merck/AAAS Undergraduate Research Program (\$60,000) Co-PI.
- 2007 Research Corporation grant number 6PR3381000172, “The Design, Synthesis, and Biological Testing of Novel and Selective Antagonists of Neuronal nAChRs” (\$56,000) PI.
- 2007 College of Arts and Science Travel Award, “NMR at the Interface,” poster presentation, Experimental Nuclear Magnetic Resonance Conference, Asilomar, CA (\$400) PI.
- 2007 College of Arts and Sciences Civic Engagement Grant Program, “Establishing Community Engagement in the Chemistry Curriculum” (\$15,000) PI.
- 2007 Boise Technology Inc., Year I, “NMR Characterization of Chemical Composition in a Mixed Phase System” (\$24,000) Collaborative Contract.
- 2007 MSTMRI, “Electrostatic Topography Mapping of Novel and Selective Antagonists of Neuronal Nicotinic Acetylcholine Receptors” (\$5,000) PI.
- 2006 NSF CRIF-MU/RUI Grant Number 0639251: “Acquisition of a 500-MHz Nuclear Magnetic Resonance Spectrometer at Boise State University” (\$500,000) Co-PI.
- 2006 Office of Research Administration (BSU), Travel Award (\$500).
- 2005 Professional Development Grant (SOU): “Keeping Current with Modern Technology in Organic Spectroscopy” (\$6,017) PI.
- 2003 NSF Workshop: “NMR Fundamentals & Applications,” Washington State Univ. (\$2,500) PI.
- 2003 Professional Development Grant (SOU): “Incorporating a New 400 MHz NMR Spectrometer into the Chemistry Curriculum” (\$3,880) PI.
- 2003 SOU Technology Resource Grant: “A New Printer for Chemistry” (\$1,300) PI.

- 2003 Murdock Charitable Trust: “Organic Spectroscopy Laboratory and Biotechnology Evolution at Southern Oregon University.” (\$213,000) Co-PI.
- 2002 Professional Development Grant (SOU): “Development of a spectroscopic database to be used by undergraduate students to improve their understanding of NMR, IR, and MS.” (\$1,713) PI.
- 2002 Carpenter II Travel Grant: Applied toward travel to the 43rd ENC, Asilomar, CA (\$350) PI.
- 2001 NSF MRI Grant Number 0116245: "Acquisition of a 400 MHz NMR Spectrometer to Broaden Research Experiences for Undergraduates at Southern Oregon University" (\$293,310) PI.
- 2001 Agilent University Relations Grant: “A New GC-MS for Chemistry.” (\$76,910) Co-PI.
- 1999 Carpenter Travel Grant: JEOL NMR System Management course, Peabody, MA (\$350) PI.
- 1999 Professional Development Grant (SOU): “Development of an advanced NMR instrumentation course for undergraduates” (\$2,350) PI.
- 1999 General Education Course Development Grant (SOU): Development of general scientific coursework and laboratory experiments for non-science majors (\$4,000) PI.
- 1998 Scientific Research Grant (SOU): Black tail deer tarsal gland research. (\$1,200) PI.
- 1998 Student Travel Award to the 39<sup>th</sup> Annual ENC, Asilomar, CA (\$700) PI.

## PUBLICATIONS

**Peer-reviewed (45 total; 29 as corresponding author,\* 8 as first author & 95 student co-authors<sup>†</sup>)**

**Owen M. McDougal**, Peter Heenan, Nigel Perry, John van Klink,\* *NZJ Botany*, “Chemotaxonomy of kōwhai: leaf and seed flavonoids of New Zealand *Sophora* species.” DOI:

<https://doi.org/10.1080/0028825X.2018.1472107> (2018).

Matthew King, Thomas Long,<sup>†</sup> Daniel Pfalmer,<sup>†</sup> Timothy Andersen, **Owen M. McDougal**,\* *BMC Bioinformatics*, “SPIDR: Small-molecule Peptide-Influenced Drug Repurposing.” *19(138)*, DOI:

<https://doi.org/10.1186/s12859-018-2153-y> (2018).

Mehruba Anwar,<sup>†</sup> Matthew W. Turner,<sup>†</sup> Natalija Farrell, Wendy B. Zomlefer, **Owen M. McDougal**,\* Brent W. Morgan,\* *Clin. Toxicol.*, “Hikers Poisoned: Identification of Alkaloids in Foraged *Veratrum parviflorum*.” DOI: <https://doi.org/10.1080/15563650.2018.1442007> (2018).

Matthew W. Turner,<sup>†</sup> John R. Cort, **Owen M. McDougal**,\* *Toxins*, “ $\alpha$ -Conotoxin Decontamination Protocol: Evaluating What Works and What Doesn’t.” *9(9)*, 281-291 (2017).

Decha Pinkaew, Abhijnan Chattopadhyay, Matthew D. King, Preedakorn Chunhacha, Zhihe Liu, Heather Stevenson, Yanjie Chen, Patuma Sinthujaroen, **Owen McDougal**, and Ken Fujise,\* *Nature Comm.*, “Fortilin Binds IRE1 $\alpha$  and Prevents ER Stress from Signaling Apoptotic Cell Death.” *8(18)*, DOI: <https://www.nature.com/articles/s41467-017-00029-1> (2017).

Narasimharao Kondamudi, Jacob K. Smith,<sup>†</sup> and **Owen M. McDougal**,\* *Amer. J. Potato Res.*, “Determination of Glycoalkaloids in Potatoes and Potato Products by Microwave Assisted Extraction.” *94(2)*, 153-158 (2017).

Matthew King, Thomas Long,<sup>†</sup> Timothy Andersen, and **Owen M. McDougal**,\* *J. Chem. Inf. Model.*, “Genetic Algorithm Managed Peptide Mutant Screening: Optimizing Peptide Ligands for Targeted Receptor Binding.” *56(12)*, 2378-2387 (2016).

Narasimharao Kondamudi, Matthew W. Turner,<sup>†</sup> **Owen M. McDougal**,\* *Nat. Prod. Comm.*, “Harpagoside Content in Devil’s Claw Extracts.” *11(9)*, 1215-1216 (2016).

- Matthew W. Turner,<sup>†</sup> Roberto Cruz,<sup>†</sup> Jared Mattos,<sup>†</sup> Nic Baughman,<sup>†</sup> Jordan Elwell,<sup>†</sup> Jenny Fothergill,<sup>†</sup> Anna Nielsen,<sup>†</sup> Jessica Brookhouse,<sup>†</sup> Ashton Bartlett,<sup>†</sup> Petr Malek,<sup>†</sup> Xinzhu Pu, Matthew D. King, **Owen M. McDougal**,\* *Bioorg. Med. Chem.*, “Cyclopamine Bioactivity by Extraction Method from *Veratrum californicum*.” **24**(16), 3752-3757 (2016).
- Paul Daniel Phillips,<sup>†</sup> Timothy Andersen, **Owen M. McDougal**,\* *AIMS Molecular Science*, “Assessing the Utility and Limitations of High Throughput Virtual Screening” **3**(2), 238-245 (2016).
- John M. T. French,<sup>†</sup> Matthew D. King, **Owen M. McDougal**,\* *Nat. Prod. Comm.*, “Quantitative Determination of Vinpocetine in Dietary Supplements” **11**(5), 607-609 (2016).
- Abhijnan Chattopadhyay,<sup>†</sup> Decha Pinkaew,<sup>†</sup> Hung Q. Doan,<sup>†</sup> Reed B. Jacob,<sup>†</sup> Sunil K. Verma,<sup>†</sup> Hana Friedman, Alan Peterson, Muge N. Kuyumcu-Martinez,<sup>†</sup> **Owen M. McDougal**, Ken Fujise,\* *Scientific Reports*, “Fortilin Fortifies PRX1 to Protect Against Alcohol-Induced Liver Damage” DOI: <https://www.nature.com/articles/srep18701> (2016).
- Matthew D. King, Paul Phillips,<sup>†</sup> Michael Katz,<sup>†</sup> Sarah Lew,<sup>†</sup> Sarah Bradburn,<sup>†</sup> Matthew W. Turner,<sup>†</sup> Tim Andersen, **Owen M. McDougal**,\* *Biochem. Mol. Biol. Educ.*, “Computational Exploration of a Protein Receptor Binding Space with Student Proposed Ligands” **44**(1), 63-67 (2016).
- Owen M. McDougal**, Peter B. Heenan, Peter Jaksons, Catherine E. Sansom, Bruce M. Smallfield, Nigel B Perry, John William van Klink,\* *Phytochemistry*, “Alkaloid Variation in New Zealand Kōwhai, *Sophora* species” **118**, 9-16 (2015).
- Thomas Long,<sup>†</sup> **Owen McDougal**, Tim Andersen,\* *J. Comp. Chem.*, “GAMPMS: Genetic Algorithm Managed Peptide Mutant Screening” **36**(17), 1304-1310 (2015).
- Randall Ryan, Bryan Martin,<sup>†</sup> Ken Tawara,<sup>†</sup> Liliana Mellor, Luke Woodbury,<sup>†</sup> Reed B. Jacob,<sup>†</sup> **Owen M. McDougal**, Julia Thom Oxford, Cheryl L. Jorcyk,\* *Cytokine*, “Oncostatin M Binds to Extracellular Matrix in a Bioactive Conformation: Implications for Inflammation and Metastasis” **72**(1), 71-85 (2015).
- Louis Nadelson, Jonathan Scaggs,<sup>†</sup> Colin Sheffield,<sup>†</sup> **Owen M. McDougal**,\* *J. Sci. Educ. & Tech.*, “Integration of Video Based Demonstrations to Prepare Students for the Organic Chemistry Laboratory” **24**(4), 476-483 (2015).
- Owen M. McDougal**, Nic Cornia,<sup>†</sup> S. V. Sambasivarao, Andrew Remm,<sup>†</sup> Chris Mallory,<sup>†</sup> Julie Thom Oxford, C. Mark Maupin,\* Tim Andersen,\* *Biochem. Mol. Biol. Educ.* “Homology Modeling and Molecular Docking for the Science Curriculum” **42**(2), 179-182 (2014).
- Somisetti V. Sambasivarao, Jessica Roberts,<sup>†</sup> Vivek S. Bharadwaj,<sup>†</sup> Jason G. Slingsby,<sup>†</sup> Conrad Rohleder,<sup>†</sup> Chris Mallory,<sup>†</sup> James R. Groome, **Owen M. McDougal**,\* C. Mark Maupin,\* *ChemBioChem*, “Acetylcholine Promotes Binding of alpha-Conotoxin MIII for  $\alpha_3\beta_2$  Nicotinic Acetylcholine Receptors” **15**, 413-424 (2014).
- Christopher M. Chandler and **Owen M. McDougal**,\* *Phytochem. Rev.*, “Medicinal History of North American *Veratrum*” **13**(3), 671-694 (2014).
- Clifford M. Csizmar,<sup>†</sup> Jeremy P. Daniels,<sup>†</sup> Lauren E. Davis,<sup>†</sup> Tyler P. Hoovis,<sup>†</sup> Karen A. Hammond, **Owen M. McDougal**, and Don L. Warner,\* *J. Chem. Ed.* “Molecular Modeling and Computational Chemistry in the Undergraduate Chemistry Laboratory” **90**(9), 1235-1238 (2013).
- Casey Bullock,<sup>†</sup> Nic Cornia,<sup>†</sup> Reed B. Jacob,<sup>†</sup> Andrew Remm,<sup>†</sup> Thomas Peavey,<sup>†</sup> Ken Weekes,<sup>†</sup> Chris Mallory,<sup>†</sup> Julia Thom Oxford, **Owen M. McDougal**,\* Tim Andersen,\* *J. Chem. Inf. Model.*, “DockoMatic 2.0: A Customizable Application for High Throughput Inverse Virtual Screening and Homology Modeling” **53**(8), 2161-2170 (2013).
- Emma C. Wanamaker,<sup>†</sup> G.C. Chingas,\* **Owen M. McDougal**,\* *Environ. Sci. & Tech.*, “Parathion Hydrolysis Revisited: *In Situ* Aqueous Kinetics by <sup>1</sup>H NMR” **47**(16), 9267-9273 (2013).



- Christopher M. Chandler, Jeffrey W. Habig, Ashley A. Fisher, Katherine V. Ambrose,<sup>†</sup> Susana T. Jiménez,<sup>†</sup> **Owen M. McDougal**,\* *Natural Product Communications*, “Improved Extraction and Complete Mass Spectral Characterization of Steroidal Alkaloids from *Veratrum californicum*” **8(8)**, 1059-1064 (2013).
- Aubrey Johnston,<sup>†</sup> Jon Scaggs,<sup>†</sup> Chris Mallory,<sup>†</sup> Andrea Haskett, Don Warner, Eric Brown, Karen Hammond, Michael McCormick, and **Owen M. McDougal**,\* *J. Chem. Ed.* “A Green Approach to Separate Spinach Pigments by Column Chromatography” **90(6)**, 796-798 (2013).
- Owen McDougal**,\* David Granum,<sup>†</sup> Mark Swartz,<sup>†</sup> Conrad Rohleder,<sup>†</sup> C. Mark Maupin,\* *J. Phys. Chem. B* “pK<sub>a</sub> Determination of Histidine Residues in  $\alpha$ -Conotoxin MII Peptides by <sup>1</sup>H NMR and Constant pH Molecular Dynamics Simulations” **117(9)**, 2653-2661 (2013).
- Ming Fang,<sup>†</sup> Reed Jacob,<sup>†</sup> **Owen McDougal**, and Julia Oxford,\* *Protein & Cell* “Minor Fibrillar Collagens: Variable Regions, Alternative Splicing, Intrinsic Disorder, and Tyrosine Sulfation,” **3(6)**, 419-433 (2012).
- Reed B. Jacob,<sup>†</sup> Tim Andersen, and **Owen M. McDougal**,\* *PLoS Comp. Bio.*, “Accessible High Throughput Virtual Screening Molecular Docking Software for Students and Educators,” **8(5)**, 1-5 (2012).
- Owen M. McDougal**, Chris Mallory,<sup>†</sup> Lisa R. Warner,<sup>†</sup> and Julie Thom Oxford,\* *GSTF Int. J. BioInforma. BioTechnol.*, “Predicted Structure and Binding Motifs of Collagen  $\alpha 1(XI)$ ,” **1(1)**, 43-48 (2012).
- Bryan Martin,<sup>†</sup> Gerry C. Chingas, and **Owen M. McDougal**,\* *J. Magn. Reson.* “Origin and Correction of Magnetic Field Inhomogeneity at the Interface in Biphasic NMR Samples,” **218**, 147-152 (2012).
- Raquel J. Brown, Christopher Mallory,<sup>†</sup> **Owen M. McDougal**, and Julia Thom Oxford,\* *Proteomics*, “Proteomic Analysis of Coll1a1-Associated Protein Complexes,” **11(24)**, 4660-4676 (2011).
- Chris Mallory,<sup>†</sup> **Owen McDougal**, Julia Oxford,\* *Proceedings of 2011 International Conference on Bioinformatics & Computational Biology* “Collagen Type XI  $\alpha 1$  Chain Amino Propeptide Structural Model and Glycosaminoglycan Interactions *in Silico*,” BIOCAMP’11/ISBN #1-60132-172-4/CSREA, Editors: Hamid R. Arabnia and Quoc-Nam Tran, pp. 632-635, Las Vegas, USA, 2011; NIHMSID#340765.
- Nicholas A. M. Weires,<sup>†</sup> Aubrey Johnston,<sup>†</sup> Don L. Warner, Michael M. McCormick, Karen Hammond, **Owen M. McDougal**,\* *J. Chem. Ed.*, “Recycling of Waste Acetone by Fractional Distillation,” **88(12)**, 1724-1726 (2011).
- Reed B. Jacob,<sup>†</sup> Casey W. Bullock,<sup>†</sup> Tim Andersen, **Owen M. McDougal**,\* *J. Comp. Chem.*, “DockoMatic – Automated Peptide Analog Creation for High Throughput Virtual Screening,” **32(13)**, 2936-2941 (2011).
- Owen M. McDougal**,\* Seth Eidemiller,<sup>†</sup> Nick Weires,<sup>†</sup> Michael McCormick, *Biomass Power & Thermal*, “Biomass Briquettes: Turning Waste into Energy,” **4(12)**, 46-49 (2010).
- Casey Bullock,<sup>†</sup> Reed Jacob,<sup>†</sup> **Owen McDougal**, Greg Hampikian, Tim Andersen,\* *BMC Res. Notes*, “DockoMatic–Automated Ligand Creation and Docking,” **3**, 289-297 (2010).
- Reed B. Jacob<sup>†</sup> and **Owen M. McDougal**,\* *Cellular and Molecular Life Sciences*, “The M-superfamily of conotoxins: a review,” **67**, 17-27 (2010).
- Matt Turner,<sup>†</sup> Seth Eidemiller,<sup>†</sup> Bryan Martin,<sup>†</sup> Andrew Narver,<sup>†</sup> Joshua Marshall,<sup>†</sup> Logan Zemp,<sup>†</sup> Kenneth A. Cornell, J. Michael McIntosh, **Owen M. McDougal**,\* *Bioorganic Medicinal Chemistry*, “Structural Basis for  $\alpha$ -Conotoxin Potency and Selectivity,” **17(16)**, 5894-5899 (2009).

**Owen M. McDougal**,\* Matthew W. Turner,<sup>†</sup> Andrew J. Ormond,<sup>†</sup> C. Dale Poulter, *Biochemistry*, “Three-Dimensional Structure of Conotoxin tx3a: An m-1 Branch Peptide of the M-Superfamily,” **47**, 2826-2832 (2008).

Coyner Graf,<sup>†</sup> and **Owen McDougal**\* *The Chemical Educator*, “A Practical Method for the Display of High Resolution One- and Two-Dimensional NMR Spectra on the World Wide Web,” **13**, 92-95 (2008).

Gloria P. Corpuz, Richard B. Jacobsen, Elsie C. Jimenez, Maren Watkins, Craig Walker, Clark Colledge, James E. Garrett, **Owen McDougal**, Wenquin Li, William R. Gray, David R. Hillyard, Jean Rivier, J. Michael McIntosh, Lourdes J. Cruz, and Baldomero M. Olivera,\* *Biochemistry*, “Definition of the M-Conotoxin Superfamily: Characterization of Novel Peptides from Molluscivorous *Conus* Venoms,” **44**, 8176-8186 (2005).

Aaron Hart<sup>†</sup> and **Owen McDougal**,\* *The Chemical Educator*, “Spectroscopic Data Management for the Time-Strapped Educator,” **9**(6), 374-377 (2004).

Jonas Buser<sup>†</sup> and **Owen McDougal**,\* *The Chemical Educator*, “A Pedagogical Approach to the Instruction of Organic Spectroscopy,” **9**(4), 216-219 (2004).

**Owen McDougal** and C. Dale Poulter,\* *Biochemistry*, “Three-Dimensional Structure of Mini-M Conotoxin mr3a,” **43**, 425-429 (2004).

Seth Holstein,<sup>†</sup> Richard Stanley, **Owen McDougal**,\* *Journal of Chemical Innovation*, “Fuel Briquettes Out of Junk Mail and Yard Wastes,” **31**(2), 22-28 (2001).

## Books

Mary K. Campbell, Shawn O. Farrell, and **Owen M. McDougal**, “Biochemistry,” 9<sup>th</sup> ed.; Cengage Learning: Mason, OH (2017) ISBN: 9781305961135.

**Owen M. McDougal** and Richard P. Steiner, “Introduction to Organic and Biological Chemistry,” 3<sup>rd</sup> ed.; Cengage Learning: Mason, OH (2011) ISBN: 9781133448365.

**Owen M. McDougal** and Richard P. Steiner, “Introduction to Organic and Biological Chemistry,” 2<sup>nd</sup> ed.; Cengage Learning: Mason, OH (2010) ISBN: 1111633673.

**Owen M. McDougal** and Richard P. Steiner, “Introduction to Organic and Biological Chemistry,” 1<sup>st</sup> ed.; Cengage Learning: Mason, OH (2009) ISBN: 1111032300.

**Owen McDougal**, “Essentials of General, Organic, and Biological Chemistry: Student Study and Solutions Guide,” Harcourt College Publishers, Orlando, FL (2000) ISBN 10: 0030056527.

## Book Chapter

**Owen McDougal**. Chapter 17, “Biochemistry” A web chapter for *Basic Concepts of Chemistry*, Seventh Edition by L. Jack Malone, John Wiley & Sons, Inc., Hoboken, NJ (2003).

## Graduate Students Directed

Mr. Paul Phillips, M. S. Chemistry, 2016, “Binding Affinity Optimization of  $\alpha$ -Conotoxin MII Analogs to Nicotinic Acetylcholine Receptors.”

Ms. Emma Baker, M. S. Chemistry, 2012, “NMR Characterization of Parathion: Properties, Transportation, & Reaction Kinetics.”

Mr. Reed B. Jacob, M. S. IDS, 2012, “DockoMatic: An Emerging Resource to Manage Molecular Docking.”

### Manuscripts under Review

Samantha K. Walker,<sup>†</sup> James R. Groome, **Owen M. McDougal**, Matthew D. King,<sup>\*</sup> *Biochemistry*, “Comparison of Computational Molecular Dynamics and Electrophysiology Studies of  $\alpha$ -Conotoxin Peptide Binding and Bioactivity.” (*Submitted March 2017; in revision*).

Matthew W. Turner,<sup>†</sup> Roberto Cruz,<sup>†</sup> Jordan Elwell,<sup>†</sup> John French,<sup>†</sup> Jared Mattos,<sup>†</sup> **Owen M. McDougal**,<sup>\*</sup> *Molecules*, “Native *Veratrum californicum* alkaloid combinations induce differential inhibition of Sonic Hedgehog signaling.” (*Submitted July 2018; under review*).

Narasimharao Kondamudi and **Owen M. McDougal**<sup>\*</sup> *J. Surfactants and Detergents*, “Microwave Assisted Synthesis and Characterization of Bio-based Surfactants.” (*Submitted July 2018*).

### PRESENTATIONS (Since 2009) (14 national, 45 regional & 31 local)

#### National/International Presentations

- 4/17 Samantha K. Walker, **Owen M. McDougal**, Matthew D. King,  *$\alpha$ -Conotoxin Peptide Mutants as Parkinson's Therapeutics: A Molecular Dynamics Study*. National American Chemical Society Meeting, San Francisco, CA.
- 4/17 Jenny Fothergill and Owen M. McDougal, *Directed Solid Phase Synthesis of  $\alpha$ -Conotoxin MII*. National American Chemical Society Meeting, San Francisco, CA.
- 3/16 Mehruba Anwar,<sup>\*</sup> N. Farrell, R. Kleiman, Wendy B. Zomlefer, Matthew W. Turner, **Owen M. McDougal**, Brent W. Morgan, *Veratrum Steroidal Alkaloid Toxicity Following Ingestion of Foraged *Veratrum parviflorum**. Amer. College of Med. Tox., Huntington Beach, CA.
- 5/14 **Owen M. McDougal**, invited lecture, *New Insights into Binding Paradigms for  $\alpha$ -Conotoxins to Neuronal Nicotinic Acetylcholine Receptors*. CSIRO, Melbourne, Australia.
- 11/13 **Owen M. McDougal**, invited lecture, *Veratrum californicum Bioactives: From Sheep to Cancer Treatment*. Department of Chemistry, University of Otago, Dunedin, NZ.
- 3/12 Rynne Ambrose and **Owen McDougal**, poster, *Extraction and Isolation of Cyclopamine from *Veratrum californicum**. National American Chemical Society Meeting, San Diego, CA.
- 7/11 Chris Mallory, Julia Thom Oxford, **Owen M. McDougal**, poster, *Collagen Type XI  $\alpha 1$  Chain NPP Structural Model and Glycosaminoglycan Interactions In Silico*. BIOCOMP'11, International Conference on Bioinformatics and Computational Biology, Las Vegas, NV.
- 8/10 **Owen M. McDougal** and Reed Jacob, poster, *Automatic DockoMatic: Ligand and Receptor Screening Made Easy*. The 240<sup>th</sup> National ACS Meeting, Boston, MA.
- 5/09 Bryan Martin, Michael Hill, **Owen McDougal**, poster, *What does NMR have to do with the Mixing of Oil and Water?* Council on Undergrad. Res. Posters on Hill, Washington DC, VA.
- 4/09 **Owen M. McDougal**, invited oral, *What does NMR have to do with Undergraduate Research?* Experimental Nuclear Magnetic Resonance Conference 50<sup>th</sup> Annual Meeting, Asilomar, CA.
- 3/09 **Owen M. McDougal**, poster, *Structural Basis for  $\alpha$ -Conotoxin Potency and Selectivity*, Experimental Nuclear Magnetic Resonance Conference 50<sup>th</sup> Annual Meeting, Asilomar, CA.

- 3/09 Seth Eidemiller, **Owen McDougal**, poster, *Model Behavior: Synthetic Conotoxin Analogs for Parkinson's*, ACS 237<sup>th</sup> Annual Meeting, Salt Lake City, UT.
- 3/09 Benjamin A. Parker, Julia Coppola, Henry Charlier, **Owen McDougal**, Michael Hill, poster, *Hydrolysis of Parathion in a Liquid-Liquid Biphasic System*, ACS 237<sup>th</sup> meeting, SLC, UT.
- 3/09 Mark Swartz, Angela Gomez, **Owen M. McDougal**, poster, *Alternative Energy at Home*, ACS 237<sup>th</sup> Annual Meeting, Salt Lake City, UT.
- 3/09 Aubrey Johnston, Michael M. McCormick, **Owen M. McDougal**, poster, *Going Green in Idaho*, ACS 237<sup>th</sup> Annual Meeting, Salt Lake City, UT.
- 3/09 Bryan Martin, Michael Hill, **Owen McDougal**, poster, *Distribution of p-Nitrophenol in a Model Biphasic System by SPS<sup>3</sup>RE NMR Spectroscopy*, ACS 237<sup>th</sup> Annual Meeting, Salt Lake City, UT.

### Regional Presentations

- 8/18 Dorian Pittman, Matthew Turner, Owen M. McDougal, poster, *Identifying the Unknown: Isolation and Characterization of Novel Alkaloids in Veratrum californicum*, Idaho Idea Network of Biomedical Research Excellence annual meeting, Moscow, ID.
- 5/18 Owen M. McDougal, invited talk, *Exploration into Food Chemistry Research at Boise State University*, BUILD Dairy annual conference, Oregon State University, Corvallis, OR
- 5/18 Tyson Hardy, invited talk, *Spectroscopic Measurement of Denatured Protein in Milk Products*, BUILD Dairy annual conference, Oregon State University, Corvallis, OR.
- 10/16 Owen M. McDougal, invited talk, *Veratrum californicum: Of One-eyed Sheep and Hedgehogs*, SUNY Oswego, public lecture, Oswego, NY.
- 7/16 Emily Wade, Ellie Hunt, Meagan Rossi, Owen M. McDougal, poster, *Aerial Versus Below-Ground Alkaloid Content Variation from Veratrum californicum as a Function of Plant Growth Cycle and Harvest Site*, ICUR, Boise State University, Boise, ID.
- 7/16 Jenny Fothergill & Owen M. McDougal, poster, *Directed Solid Phase Synthesis of  $\alpha$ -Conotoxin MII*, ICUR, Boise State University, Boise, ID.
- 6/16 Owen M. McDougal, oral, *DockoMatic 2.1: Constructing a Comprehensive Open Source Tool for Computational Chemistry*, AAASPD, University of San Diego, San Diego, CA.
- 6/16 Paul Phillips and Owen M. McDougal, oral, *Binding Affinity Optimization of  $\alpha$ -Conotoxin MII Analogs to Nicotinic Acetylcholine Receptors*, AAASPD, Univ. San Diego, CA.
- 7/15 Jordan Elwell, Roberto Cruz, Matt Turner, Owen M. McDougal, Poster, *Extraction Optimization of Bioactive Alkaloids from Veratrum californicum*, Idaho Conference on Undergraduate Research, Boise State University, Boise, ID.
- 6/15 Owen M. McDougal, *Exploring the Limits of Computational Drug Screening*, AAASPD, San Francisco State University, San Francisco, CA.
- 9/14 Owen M. McDougal, Invited Oral, *Alkaloid Composition of New Zealand Sophora Species*, Idaho State University, Meridian, ID Campus.
- 6/14 Owen M. McDougal, Invited Oral, *Using  $\alpha$ -Conotoxin Molecular Scaffolds to Inform the Discovery of Potent and Selective Receptor Ligands toward the Treatment of Parkinson's Disease*, AAASPD, Riverside, CA.
- 8/13 Anna V. Nielsen<sup>†</sup>, Jared Mattos<sup>†</sup>, Petr Malek<sup>†</sup>, Christopher M. Chandler, **Owen M. McDougal**<sup>\*</sup>, *Influence of pH on Alkaloid Extraction Efficiency and Biological Activity from Veratrum californicum*, 11<sup>th</sup> INBRE conference, Moscow, ID.

- 6/13 **Owen M. McDougal**, Invited Oral & Key Note Address, *Veratrum californicum: Of One-eyed Sheep and Hedgehogs*, The 94<sup>th</sup> Annual AAASPD conference, Las Vegas, NV.
- 6/13 **Owen M. McDougal**, *Small Peptides Equate to Big Computational Challenges*, The 94<sup>th</sup> Annual AAASPD conference, Las Vegas, NV.
- 6/13 Nic Cornia, **Owen M. McDougal**, Tim Andersen, *Introducing DockoMatic: A Computational Tool for Scientists*, The 94<sup>th</sup> Annual AAASPD conference, Las Vegas, NV.
- 6/13 Conrad Rohleder, Vivek S. Bharadwaj, Somisetti V. Sambasivarao, Jason G. Slingsby, Chris Mallory, James Groome, **Owen M. McDougal**, C. Mark Maupin, *Insights into Acetylcholine and  $\alpha$ -Conotoxin MII Binding to  $\alpha_3\beta_2$  Nicotinic Acetylcholine Receptors from Homology Modeling and MM/PBSA Studies*, The 94<sup>th</sup> Annual AAASPD conference, Las Vegas, NV.
- 6/13 **Owen M. McDougal**, David M. Granum, Mark Swartz, Conrad Rohleder, C. Mark Maupin, *pK<sub>a</sub> Determination of Histidine Residues in  $\alpha$ -Conotoxin MII Peptides by <sup>1</sup>H NMR and Constant pH Molecular Dynamics Simulation*. The 94<sup>th</sup> Annual AAASPD conference, Las Vegas, NV.
- 6/13 Jared Mattos, Petr Malek, Chris Chandler, **Owen McDougal**, *Optimizing Extraction of Biologically Active pH Sensitive Steroidal Alkaloids from *Veratrum californicum**, AAASPD, Las Vegas, NV.
- 8/12 Susana T. Jimenez, Gerry Chingas, Ashley Fisher, Owen M. McDougal, *Isolation and Analysis of Steroidal Alkaloids from *Veratrum californicum**, 10<sup>th</sup> INBRE conference, Moscow, ID.
- 6/12 Thomas Peavey, Ken Weekes, Reed B. Jacob, **Owen McDougal**, *DockoMatic: Pharmaceutical Application by Inverse Virtual Screening*, The 93<sup>rd</sup> Annual AAASPD conference, Boise, ID.
- 6/12 Ashley Fisher and **Owen McDougal**, oral, *Separation and Characterization of Multiple Component Detergent Systems*. The 93<sup>rd</sup> Annual AAASPD conference, Boise, ID.
- 6/12 Nick Baker, Ken Weekes, Julia Thom Oxford, **Owen McDougal**, *Blender: Science Inspired by Art*. The 93<sup>rd</sup> Annual AAASPD conference, Boise, ID.
- 6/12 Ken Weekes, Reed B. Jacob, **Owen McDougal**, *DockoMatic: Computational Protein-Ligand Docking*. The 93<sup>rd</sup> Annual AAASPD conference, Boise, ID.
- 6/12 Mayra Estrada, Chris Chandler, Jessica Brookhouse, Ashley Fisher, **Owen McDougal**, *Medicinal Alkaloids from the Mountains of Idaho*. The 93<sup>rd</sup> AAASPD conference, Boise, ID.
- 6/12 Emily Drussel and **Owen McDougal**, oral, *Research and Development of Industrial Green Specialty Cleaners*. The 67<sup>th</sup> Annual ACS NORM conference, Boise, ID.
- 6/12 Erik Sheldon, Mark M. Swartz, **Owen M. McDougal**, *Investigation of Parkinson's using Peptide Probes*. The 67<sup>th</sup> Annual ACS NORM conference, Boise, ID.
- 6/12 Petr Malek, Emily Drussel, Ashley Fisher, **Owen McDougal**, *Qualitative Analysis of Detergents*. The 67<sup>th</sup> Annual ACS NORM conference, Boise, ID.
- 6/12 Savannah Rice, Jessica Brookhouse, Ashley Fisher, **Owen McDougal**, *Separation and Identification of Medicinal Alkaloids*. The 67<sup>th</sup> Annual ACS NORM conference, Boise, ID.
- 6/12 Andrew Remm, Ken Weekes, Reed Jacob, **Owen McDougal**, *Evaluating the Role of Computational Molecular Docking in Predicting Binding Paradigms*. The 67<sup>th</sup> Annual ACS NORM conference, Boise, ID.
- 9/11 **Owen M. McDougal**, invited oral, *Computational Solutions to Biochemical Problems*. The 2<sup>nd</sup> Annual CAES Idaho Modeling, Simulation, and Visualization Conference, Boise, ID.
- 9/11 Reed B. Jacob and **Owen M. McDougal**, *DockoMatic with Relaxator: Receptor Side-Chain Flexibility*. The 2<sup>nd</sup> CAES Idaho Modeling, Simulation, and Visualization conference, Boise, ID.

- 8/11 Rynne Ambrose and **Owen M. McDougal**, poster, *Extraction and Isolation of Cyclopamine from Veratrum californicum*. The 9<sup>th</sup> Annual INBRE conference, Moscow, ID.
- 8/11 Chris Mallory and **Owen M. McDougal**, oral, *Collagen Type XI  $\alpha 1$  Chain Amino Propeptide Structural Model and Glycosaminoglycan Interactions in Silico*. The 9<sup>th</sup> Annual INBRE conference, Moscow, ID.
- 6/11 **Owen M. McDougal**, oral, *Bridging the Experimental to Computational Divide*. The 92<sup>nd</sup> Annual AAASPD conference, San Diego, CA.
- 6/11 Chris Mallory, Julia Oxford, and **Owen M. McDougal**, oral, *Collagen XI  $\alpha 1$  Chain Amino Propeptide Structural Model and Glycosaminoglycan Interactions in Silico*. The 92<sup>nd</sup> Annual AAASPD conference, San Diego, CA.
- 6/11 Reed B. Jacob and **Owen M. McDougal**, oral, *Predictive Potential Unraveled with DockoMatic*. The 92<sup>nd</sup> Annual AAASPD conference, San Diego, CA.
- 8/10 Julia Oxford, Cheryl Jorcyk, and **Owen McDougal**, invited oral, *Extracellular Matrix Modulates Cell Signaling*. The 8<sup>th</sup> Annual INBRE Conference, Moscow, ID.
- 8/10 Chris Mallory, **Owen McDougal**, and Julia Oxford, poster, *Computational Studies of Collagen XI  $\alpha 1$  Domain*. The 8<sup>th</sup> Annual INBRE Conference, Moscow, ID.
- 8/10 Mark M. Swartz, Seth Eidemiller, Ken Cornell, and **Owen McDougal**, poster, *Metabolic Analysis of MTN Deficiency in E. coli*. The 8<sup>th</sup> Annual INBRE Conference, Moscow, ID.
- 8/10 Nick Weires, Andrew Narver, and **Owen McDougal**, poster, *NMR Investigation of Conotoxin  $pK_a$* . The 8<sup>th</sup> Annual INBRE Conference, Moscow, ID.
- 6/10 **Owen M. McDougal** and Reed B. Jacob, invited oral, *DockoMatic: Automating Autodock for Ligand to Receptor Binding Prediction*. The 91<sup>st</sup> Annual AAASPD Conference, Ashland, OR.
- 6/10 Emily Drussel, Bryan Martin, David Luker, Michael Hill, Gerry Chingas, and **Owen McDougal**, poster, *Using NMR Techniques in a Model Biphasic System to Find Partition Coefficients*. The 91<sup>st</sup> Annual AAASPD Conference, Ashland, OR.
- 6/10 Aubrey Johnston, Michael M. McCormick, Karen Hammond, Don Warner, and **Owen M. McDougal**, oral, *Going Green in the Organic Lab*. AAASPD Conference, Ashland, OR.
- 8/09 Reed B. Jacob, Ken Cornell, and **Owen M. McDougal**, invited oral, *Finding MRSA's Kryptonite: Computational Directed Combatant Pentapeptides*. The 90<sup>th</sup> Annual AAASPD Conference, San Francisco, CA.
- 8/09 Chris Mallory, Emily Drussel, and **Owen M. McDougal**, poster,  *$\alpha$ -Conotoxin E11A Binding Activity Towards Nicotinic Acetylcholine Receptor*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.
- 8/09 Luke Woodbury, **Owen M. McDougal**, and Julia Oxford, poster, *Chondroitin Sulfate Glycosaminoglycan Binding Sites within Collagen Type XI*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.
- 8/09 Andrew Narver and **Owen M. McDougal**, poster,  *$pK_a$  Determination in Alpha-Conotoxin MII and Analogs*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.
- 8/09 David Luker and **Owen M. McDougal**, poster, *Taking a Slice out of NMR – A New Method*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.
- 8/09 Aubrey Johnston and **Owen M. McDougal**, poster, *Peptide Synthesis, Cleavage and Purification*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.

- 8/09 Seth Eidemiller, Ken Cornell, and **Owen McDougal**, poster, *Manipulation of E. coli: A Metabolomics Study*. The 8<sup>th</sup> Annual INBRE Research Conference, Pocatello, ID.
- 4/09 **Owen M. McDougal**, invited oral, *Where does all the Time Go?* Idaho INBRE Research Symposium, Boise State University, Boise, ID.
- 2/09 **Owen M. McDougal**, invited oral, *Idaho INBRE Research Opportunity for Undergraduates: Peptides for Parkinson's*, Brigham Young University-Idaho, Rexburg, ID.

### Local Presentations

- 8/18 Dorian Pittman, Matthew Turner, Owen M. McDougal, poster, *Identifying the Unknown: Isolation and Characterization of Novel Alkaloids in Veratrum californicum*, Idaho Conference on Undergraduate Research annual meeting, Boise, ID.
- 4/18 Maranda Cantrell and Owen M. McDougal, poster, *Organosulfide Components of Onions*, BSU Graduate Student Showcase (GSS), BSU, Boise, ID. AWARD – Best Poster
- 4/18 Matt Turner and Owen M. McDougal, poster, *Novel Alkaloid Inhibitors of Sonic Hedgehog Signaling*, GSS, BSU Boise, ID.
- 4/18 Vanessa Campfield and Owen M. McDougal, poster, *Isolation, Purification and Characterization of Novel Steroidal Alkaloids from V. californicum*, URC, BSU, Boise, ID.
- 4/18 Tyson Hardy and Owen M. McDougal, poster, *Spectroscopic Measurement of Denatured Protein in Milk Products*, URC, BSU, Boise, ID.
- 10/17 Owen M. McDougal, invited talk, *Natural Products: From Food to Fatal*, BSU Chemistry & Biochemistry seminar series, Boise, ID.
- 11/16 Owen M. McDougal, invited talk, *Veratrum californicum: Of One-eyed Sheep and Hedgehogs*, BSU Chemistry & Biochemistry seminar series, Boise, ID.
- 4/16 Jacob Smith,<sup>†</sup> Rao Kondamudi, Owen M. McDougal, poster, *Microwave Assisted Extraction of Glycoalkaloids from Idaho Potatoes and Potato Products*, BSU URC, Boise, ID.
- 4/16 Owen M. McDougal, invited talk, *Center for Excellence in Chemical Analysis*, Agriculture Research at Boise State University, Boise, ID.
- 2/16 Owen M. McDougal, invited talk, *Validating Prediction: How Good are We?*, Computing Days Lightning Talks, BSU, Boise, ID.
- 1/16 Owen M. McDougal, invited talk, *Alkaloid Composition of New Zealand Sophora Species*, BSU chemistry seminar series, BSU, ID.
- 10/15 Rao Kondamudi and Owen M. McDougal, invited talk, *Purity Testing for Devil's Claw*, Bodybuilding.com, Boise, ID.
- 10/15 Matthew D. King and Owen M. McDougal, invited talk, *Quantitative Determination of Vinpocetine in Dietary Supplements*, Bodybuilding.com, Boise, ID.
- 10/15 Rao Kondamudi and Owen M. McDougal, invited talk, *IGEM and BSU Analytical Services*, BHS Specialty Chemicals, Nampa, ID.
- 4/14 Petr Malek<sup>†</sup> & **Owen M. McDougal**<sup>\*</sup>, *Expediting Drug Discovery: Fast and Accurate Prediction of Coupling Constants from Nitrogen Heterocycles*, BSU Summer URC, Boise, ID.
- 4/14 Roberto Cruz<sup>†</sup>, Jared Mattos<sup>†</sup>, Nic Baughman<sup>†</sup>, Petr Malek<sup>†</sup>, Chris Chandler, Owen McDougal<sup>\*</sup>, *Extraction Optimization of Bioactive Alkaloids from Veratrum californicum*, BSU URC, Boise, ID.

- 8/13 Anna V. Nielsen<sup>†</sup>, Jared Mattos<sup>†</sup>, Petr Malek<sup>†</sup>, Christopher M. Chandler, **Owen M. McDougal**<sup>\*</sup>, *Influence of pH on Alkaloid Extraction Efficiency and Biological Activity from Veratrum californicum*, BSU summer Undergraduate Research Conference (URC), Boise, Id.
- 4/13 Belinda Stierman, Jen Forbey, **Owen M. McDougal**, poster, *Chemical Warfare Agents in Plants: Biodefensive Terpenes from Sagebrush*. The 10<sup>th</sup> annual URC, BSU, Boise, Id.
- 4/13 Jared Mattos, Petr Malek, Chris Chandler, **Owen McDougal**, poster, *Improving Extraction and Separation Methods of Steroidal Alkaloids from V. californicum*. URC, BSU, 10<sup>th</sup> annual.
- 4/13 Petr Malek, Jared Mattos, Chris Chandler, **Owen McDougal**, poster, *Cyclopamine Concentration from Extraction as a Function of pH*. The 10<sup>th</sup> annual URC, BSU, Boise, Id.
- 8/12 Mayra Estrada, Ashley Fisher, **Owen M. McDougal**, poster, *Extraction and HPLC Separation of Alkaloids from Veratrum californicum*. LSAMP Conference, Boise State University, Boise, ID.
- 7/12 Jared Mattos, Ashley Fisher, **Owen M. McDougal**, poster, *Design and Development of Green Cleaners*. Undergraduate Research Conference (URC), Boise State University, Boise, ID.
- 7/12 Kevin Hou, Ashley Fisher, **Owen M. McDougal**, poster, *Processing and Analysis of Complex NMR Spectra with AMIX*. URC, Boise State University, Boise, ID.
- 7/12 Susana T. Jimenez, Jessica Brookhouse, Andrew Remm, Ashley Fisher, **Owen M. McDougal**, poster, *Characterization of Steroidal Alkaloids Isolated from Veratrum californicum*. URC, Boise State University, Boise, ID.
- 7/12 Andrew Remm, Ken Weekes, and **Owen McDougal**, poster, *DockoMatic Molecular Docking: Computational Laboratory Experiment*. URC, Boise State University, Boise, ID.
- 4/12 Ken Weekes, Reed B. Jacob, and **Owen M. McDougal**, poster, *DockoMatic: Molecular Docking Analysis of Biological Systems*. URC, Boise State University (BSU), Boise, ID.
- 4/12 Jessica Brookhouse, Chris Chandler, Rynne Ambrose, Ashley Fisher, and **Owen M. McDougal**, poster, *Medicinal Alkaloids from the Mountains of Idaho*. URC, BSU, Boise, ID.
- 10/11 **Owen M. McDougal**, invited oral, *The Chemical Umbrella: Earth to Clouds*. Department of Materials Science and Engineering, BSU, Boise, ID.
- 4/11 Teslin Brasseur, Emily Drussel, Emma Baker, Michael Hill, Gerry Chingas, and **Owen M. McDougal**, poster, *Chemical Warfare Agent Decontamination by Surfactant Accelerated Hydrolysis as Studied by <sup>1</sup>H Nuclear Magnetic Resonance Spectroscopy*. URC, BSU, Boise, ID.
- 4/11 Mark M. Swartz, Chris Mallory, and **Owen M. McDougal**, poster, *Investigation of Parkinson's Using Peptide Probes*. URC, BSU, Boise, ID.
- 4/10 Luke Woodbury, Kendra Coonse, **Owen McDougal**, and Julia Oxord, poster, *Determination of Sulfated Glycosaminoglycan Binding Sites within Collagen Type XI Using Surface Plasmon Resonance and Nuclear Magnetic Resonance Spectroscopy*. URC, BSU, Boise, ID.
- 4/10 Emily Drussel, Bryan Martin, Michael Hill, Gerry Chingas, and **Owen McDougal**, poster, *Using NMR Techniques to Find Partition Coefficients Across Biphasic Systems*. URC, BSU, Boise, ID.
- 4/10 Scotia Gonzales and **Owen McDougal**, poster, *Pentapeptide Synthesis, Cleavage, and Purification*. URC, BSU, Boise, ID.
- 4/10 Chris Mallory and Owen McDougal, poster, *Bioinformatics, Homology Modeling, and Parkinson's Disease*. URC, BSU, Boise, ID.
- 4/10 Andrew Narver and Owen McDougal, poster, *pK<sub>a</sub> Determination of Alpha Conotoxin MII and Analogs*. URC, BSU, Boise, ID.



- 4/09 Aubrey Johnston and **Owen McDougal**, poster, *Going Green at Boise State University*, URC, BSU, Boise, ID.
- 4/09 Reed Jacob, Matt Walters, Ken Cornell, and **Owen McDougal**, poster, *Resistance is Not Futile: Computational Directed Design of Combatant Pentapeptides*, URC, BSU, Boise, ID.
- 4/09 Mark Swartz and **Owen McDougal**, poster, *Affordable Alternative Energy at the Community Level*, URC, BSU, Boise, ID.

## **SERVICE**

### **Awards and Honors**

- 2018 Faculty Excellence Award, College of Arts and Sciences, Boise State University.
- 2018 Biomolecular Sciences Ph.D. Candidate, Maranda Cantrell, Best Poster, Graduate Student Showcase, Boise State University.
- 2017 Biomolecular Sciences Ph.D. Candidate, Matthew Turner, recipient of the Outstanding Graduate Student Award.
- 2016 Nominated to Project Kaleidoscope (PKAL) Summer Leadership Institute.
- 2016 Elected Department Chair, Chemistry & Biochemistry, Boise State.
- 2016 Cover article, *Journal of Chemical Information and Modeling*, **56**(12), 153-158.
- 2015 Nominated Associate Department Chair, Chemistry & Biochemistry, Boise State.
- 2013 Invited Founding Editor in Chief for *AIMS Molecular Science*.
- 2013 Invited Speaker: Key Note Address; 95<sup>th</sup> Annual American Association for the Advancement of Science Pacific Division Conference UNLV, Las Vegas, NV.
- 2013 Faculty Mentor for Student Research Initiative Program honoree, Belinda Steirman, Boise State University, Boise, ID.
- 2011 Feature/Cover Article, "Proteomic Analysis of Col11a1-Associated Protein Complexes," *Proteomics*.
- 2011-2013 Chair Elect Snake River Local Section of the American Chemical Society
- 2011 Nominated for Foundation Scholars Service Award, Boise State University.
- 2012-2014 President Elect American Association for the Advancement of Science, PD
- 2010-2011 Presidential Leadership Academy, Boise State University.
- 2009 Certificate of completion, AMIX Metabolomics NMR Software training course, Bruker Biospin Inc., Peabody, MA.
- 2009 Undergraduate Student Research Achievement Award, Council on Undergraduate Research, Posters on the Hill, Washington, DC.
- 2008 Recipient Scientific User Access, Pacific Northwest National Laboratory-Environmental Molecular Sciences Laboratory, Richland, WA.
- 2008 Undergraduate Student Research Achievement Award, Council on Undergraduate Research, Posters on the Hill, Washington, DC.
- 2007 College of Arts and Sciences Travel Award, 48<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference, Asilomar, CA.

- 2007 Certificate of completion, Center for Teaching and Learning, Service Learning Course Development six-week training workshop.
- 2006 Recipient Travel Award, OSP, Boise State University, Boise, ID.
- 2006 Certificate of appreciation for ten years of service, National Ski Patrol.
- 2003 National Science Foundation Workshop Award, “NMR Fundamentals and Applications,” Washington State University, Pullman, WA.
- 2002 Recipient of Carpenter II Travel Award, 43<sup>rd</sup> Experimental Nuclear Magnetic Resonance Conference, Asilomar, CA.
- 2001 Feature/Cover Article, “A Unique Approach to Conservation,” *Journal of Chemical Innovation*.
- 1999 Recipient of Carpenter II Travel Award, JEOL ECLIPSE NMR System Management Course, Peabody, MA.
- 1999 Recipient of General Education Course Development Grant, Southern Oregon University, Ashland, OR.
- 1998 Recipient of Student Travel Award, 39<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference, Asilomar, CA.

## Professional Service

### National

- 2013 Founding Editor in Chief, American Institute of Mathematical Sciences (AIMS) Molecular Science journal.
- 2012 US Proposal Reviewer, International Science & Technology Center & Science & Technology Center in Ukraine Projects, CRDF Global Science Centers Proposal.
- 2009 Local Section Activities Committee, American Chemical Society.
- 2009 Councilor, Snake River Local Section of the American Chemical Society.
- 2009 Chemistry Exam Writer, United States Academic Decathlon (USAD), 450 MC questions for high achieving high school students; <http://www.usad.org/>.
- 2007 NSF Merit Review: Bio & Hydrogen Panel: Sustainable Energy, Washington DC.
- 1998-06 National Ski Patrol: Park City, UT (1996-1998) & Mt. Ashland, OR (1998-2006).

### Regional

- 2016 Symposium chair: *Contributed Papers in Chemistry & Biochemistry*, 97<sup>th</sup> AAASPD conference, University of San Diego, San Diego, CA.
- 2016 Symposium co-chair: *Theory, Experiment, and Computations: A Synergistic Approach to Research*, 97<sup>th</sup> AAASPD conference, University of San Diego, San Diego, CA.
- 2015 Symposium chair: *Contributed Papers in Chemistry & Biochemistry*, 96<sup>th</sup> AAASPD conference, San Francisco State University, San Francisco, CA.
- 2015 Symposium co-chair: *Theory, Experiment, and Computations: A Synergistic Approach to Research*, 96<sup>th</sup> AAASPD conference, San Francisco State University, San Francisco, CA.
- 2014 Symposium chair: *Contributed Papers in Chemistry & Biochemistry*, 95<sup>th</sup> AAASPD conference, Riverside, CA.

- 2014 Symposium co-chair: *Theory, Experiment, and Computations: A Synergistic Approach to Research*, 95<sup>th</sup> AAASPD conference, Riverside, CA.
- 2013-14 Chair, President-Elect Nominating committee AAASPD.
- 2012-14 President-Elect, President, Past President, AAASPD.
- 2013 Chair, Executive Director Search committee AAASPD.
- 2013 Symposium co-chair: *Ion Channels: Integration of Computer Simulations with Experiments*, 94<sup>th</sup> AAASPD conference, UNLV, Las Vegas, NV.
- 2013 Workshop co-chair: *DockoMatic: Docking Calculations and Homology Modeling*, 95<sup>th</sup> AAASPD conference, UNLV, Las Vegas, NV.
- 2013 Symposium co-chair: *Chemistry and Biochemistry and Dental Medicine*, contributed paper session, 94<sup>th</sup> AAASPD conference, UNLV, Las Vegas, NV.
- 2013 Chair, Snake River Local Section American Chemical Society
- 2012 Co-general Chair, ACS NORM, Program Chair, AAASPD, and co-chair DockoMatic Computational Chemistry workshop, co-located annual meeting, Boise Center, Boise, ID.

## Institutional Service

### University Level Committees

- 2016 College of Arts and Sciences Chairs Counsel, Chemistry & Biochemistry representative.
- 2014-16 College of Arts and Sciences Tenure and Promotion Committee; ***Committee Chair 2015***.
- 2010-11 Provost and Vice President of Academic Affairs, University Search Committee, faculty representative.
- 2010-11 Technology in Teaching and Learning Committee, faculty representative.
- 2010-11 Alternative Academic Calendar Committee, faculty representative.
- 2010-10 Associate Vice President for Human Resources, University Search Committee, faculty representative.
- 2010-11 Academic Grievance Board, faculty representative.
- 2009-11 University Naming Committee; Faculty Senate/All Faculty representative.
- 2007–11 Faculty Senate, College of Arts and Sciences Natural Sciences representative; ***Senate President from 9/09 - 5/11***.
- 2009–10 Graduate Council, Math and Science representative.
- 2009-10 Associate Vice President for Information Technology, University Search Committee, faculty representative.
- 2009–10 Faculty Grievance Committee, Faculty Senate Liaison.
- 2008–11 Honorary Doctorate Degree Selection Committee, Science Representative.
- 2000–03 Professional Development Committee, Southern Oregon University. ***Committee Chair 9/02 – 6/03***.

### Department Level Committees

2017 Supervisor Round Table, Chair  
2016 Industry Relations Committee, Chair  
2015 Inorganic Chemist Search Committee  
2014 Analytical Chemist Search Committee  
2014 Space Utilization Committee  
2012 NMR Facility Manager Search Committee  
2009-15 Graduate Studies Committee  
2008-15 Student Award & Scholarship Committee  
2008-09 NMR Facility Manager Search Committee, Chair  
2009-10 Biochemist Search Committee  
2008-09 Biochemist Search Committee  
2007-08 Biochemist Search Committee, Chair  
2006-07 Public Relations/Outreach Committee  
1999-04 Environmental Studies Committee, Chemistry Department Representative, SOU.

### **Professional Association Memberships**

American Association for the Advancement of Science, Lifetime Member  
Idaho Academy of Sciences, Lifetime Member  
American Chemical Society  
Sigma Xi, Scientific Research Society

### **Invited Manuscript, Textbook & Grant Reviewer**

Toxins  
Marine Toxins  
Environmental Science & Technology  
Medicinal Research Reviews  
AIMS Molecular Science  
Journal of Organic Chemistry  
Journal of Natural Products  
PLoS ONE  
African Journal of Pure and Applied Chemistry  
ACS Petroleum Research Foundation Proposal Reviewer  
TURKISH Journal of Biology  
Marine Drugs  
Environmental Chemistry Letters  
Journal of Molecular Graphics and Modelling  
Current Computer Aided Drug Design  
Organic Chemistry 11<sup>th</sup> Ed., Solomons/Fryhle/Snyder; Wiley Publishing  
Biochemical Journal  
Amino Acids

Science & Tech. Center in Ukraine; Dept. of State's BioEngagement Program  
Journal of the American Chemical Society  
Journal of Chemical Education  
Biochemistry  
Bioorganic Medicinal Chemistry  
Pharmaceutical Research  
The Chemical Educator  
NSF Biohydrogen Review Panel, Washington, DC  
Thompson Learning; Hardcourt; McGraw Hill

## **COURSES TAUGHT (2009 – Present)**

- CHEM 101 – ESSENTIALS OF CHEMISTRY I (3-0-3)(F,S,SU)(DLN). First semester of a sequence course designed primarily for health science majors or students who need an introductory chemistry course prior to taking CHEM 111. Basic concepts of inorganic and physical chemistry are covered. PREREQ: MATH 108 or satisfactory placement score. COREQ: CHEM 101L.
- CHEM 102 – ESSENTIALS OF CHEMISTRY II (3-0-3)(S). Continuation of CHEM 101 to include basic concepts of organic and biochemistry. PREREQ: CHEM 101. COREQ: CHEM 102L.
- CHEM 105 – ACCELERATED ESSENTIALS OF CHEMISTRY (4-0-4). Chemistry and its importance to fields of study in health sciences. Basic concepts of inorganic and organic chemistry and biochemistry. Assumes that students without one year of high school chemistry have completed a semester preparative course such as CHEM 099 or CHEM 100. PREREQ: MATH 025 or satisfactory placement score. COREQ: CHEM 105L **Enrollment: 29.**
- CHEM 286 – DIRECTED READING IN CHEMISTRY (1-0-1). An individual study of a topic in chemistry arranged by the student in conjunction with a supervising member of the chemistry faculty. May be repeated for credit. **Enrollment: 16**
- CHEM 301 – SURVEY OF ORGANIC CHEMISTRY (3-0-3)(S). For students expecting to take only one semester of organic chemistry. An overview of organic chemistry covering the fundamental principles of nomenclature, reactions, synthesis, mechanisms, stereochemistry, spectroscopy, lipids, proteins, and carbohydrates. PREREQ: CHEM 111-112, CHEM 112L. COREQ: CHEM 308.
- CHEM 307 – ORGANIC CHEMISTRY I (3-0-3)(F). For students expecting to take two semesters of organic chemistry. More in-depth treatment of structure and bonding in organic molecules, mechanisms of organic reactions, chemical transformations of some of the functional groups of organic chemistry, synthesis, and determination of chemical structures. PREREQ: CHEM 111-112, CHEM 112L, COREQ: CHEM 308. **Enrollment: 220.**
- CHEM 308 – ORGANIC CHEMISTRY I LABORATORY (1-3-2)(F). Lab to accompany CHEM 307. Introduction to organic laboratory techniques, spectroscopic methods and organic syntheses. One three-hour lab and one hour of recitation per week. COREQ: CHEM 307. **Enrollment: 24**
- CHEM 309 – ORGANIC CHEMISTRY II (3-0-3)(S). A continuation of CHEM 307, covering additional functional groups and advanced topics in organic chemistry. PREREQ: CHEM 307, PRE/COREQ: CHEM 310. **Enrollment: 166.**
- CHEM 310 – ORGANIC CHEMISTRY II LABORATORY (1-3-2)(S). Lab to accompany CHEM 309. More advanced organic laboratory techniques, syntheses, organic qualitative analysis, spectroscopic methods, and an introduction to molecular modeling. Three hours of laboratory and one hour of recitation per week. PREREQ: CHEM 308. PRE/COREQ: CHEM 309. **Enrollment: 18.**

CHEM 323 – ADVANCED SYNTHESIS LABORATORY (1-5-3)(F,S)(CID). Advanced techniques in the preparation, isolation, characterization of organic, organometallic, inorganic, and polymer compounds. Introduction to technical report writing and the use of the chemical literature. PREREQ: ENGL 102 (or ENGL 112), CHEM 211/212 and CHEM 310. PRE/COREQ: CHEM 321. **Enrollment: 16.**

CHEM 386 – DIRECTED READING IN CHEMISTRY (1-0-1). An individual study of a topic in chemistry arranged by the student in conjunction with a supervising member of the chemistry faculty. May be repeated for credit. **Enrollment: 9.**

CHEM 396/496/596 – RESEARCH IN CHEMISTRY (Variable Credit). An individual laboratory research project in chemistry arranged by the student in conjunction with a supervising member of the chemistry faculty. May be repeated for credit. **Enrollment: 2-6.**

CHEM 440/540 – SPECTROSCOPIC IDENTIFICATION (3-0-3)(S). Identification of compounds using modern spectrometric techniques. PREREQ: CHEM 309 and CHEM 321. **Enrollment: 20.**

CHEM 495 – RESEARCH IN CHEMISTRY (Variable Credit). An individual laboratory research project in chemistry selected by the student in conjunction with a supervising member of the chemistry faculty. Library research and written reports required. May be repeated for credit. PREREQ: CHEM 309. PRE/COREQ: CHEM 322. **Enrollment: 1-5.**

CHEM 498 – SEMINAR (2-0-2)(F/S)(FF). Group discussions of individual reports on selected topics in various fields of chemistry. PREREQ: Chemistry major and senior standing. **Enrollment: 11.**

BIOL 498/598 – SEMINAR (On demand). Peptide Binding in Health and Disease. **Enrollment: 7.**

CHEM 498 – SEMINAR (2-0-2) (F/S)(FF). Group discussions of individual reports on selected topics in various fields of chemistry. **Enrollment: 16.**

CHEM 500 – RESEARCH METHODS IN CHEMISTRY AND BIOCHEMISTRY (1-0-1)(F). An introduction to project planning, literature assessment, report writing, and data management. PREREQ: Admission to chemistry graduate program. **Enrollment: 4.**

CHEM 561 – INTRODUCTION TO MOLECULAR MODELING AND COMPUTATIONAL CHEMISTRY (1-3-2) (On demand). Overview of modern computational chemistry. Use of computational chemistry tools and their application to problems of chemical and biological interest. PREREQ: CHEM 322, or PHYS 309 and PHYS 432, or PERM/INST. **Enrollment: 7.**

CHEM 593 – THESIS RESEARCH. **Enrollment: 1-3.**

BMOL 605 - CURRENT SCIENTIFIC LITERATURE (1-0-1)(F). Written and oral presentation of current topics from the published literature in areas of Biomolecular Sciences aimed at integrating material from the various related disciplines. Course will be multidisciplinary involving in depth discussion and critical analysis of current literature by the students.

Computational Chemistry Workshop (2010): A week-long summer session taught with colleagues in computer science, computational chemistry, biological sciences, and chemical engineering. Topics included computational theory, homology modeling, molecular docking, and results analysis. **Participants: ~13.**

DockoMatic Workshop (2012): A computational workshop as part of the 2012 AAASPD meeting in Boise, ID. Topics included computational theory, homology model creation, molecular docking, and results analysis. This tutorial was submitted for publication to *Biochemistry and Molecular Biology Education*, and is available at Sourceforge.net. **Participants: 8.**

Coordination of all Organic Chemistry labs (F2011-Sp2013): I was responsible for weekly training sessions with lab instructors, teaching assistants, and adjuncts. We covered pitfalls, safety, reporting, grading, and conduct requirements for each lab experiment in C302, C308 and C310. I prepared laboratory manuals each semester, ordered desk copies of technique guides and laboratory notebooks, oversaw safety incidents, and ensured grades and grade disputes were addressed.

**Enrollment: C302 N=48-72; C308 N=210; & C310 N=162.**

Honors Chemistry Module (CHEM 400) Marine and Terrestrial Natural Products Chemistry (2014) I provided a five week, intensive specialized course in natural products to senior chemistry majors at the University of Otago, Dunedin, NZ. **Enrollment: 12.**

## **THESIS COMMITTEES**

Vannessa Campfield*	Chemistry MS	BUILD Dairy – Propionibacteria
Leanna Marquart*	Chemistry MS	Conotoxin – PC12, NMR structure
Maranda Cantrell*	BMOL Ph.D.	Natural products – Food chemistry
Daniel Pfalmer*	BMOL Ph.D.	Computational – Fortilin & 14-3-3
Matt Turner*	BMOL Ph.D.	<i>V. californicum</i> & conotoxins
Vanessa Bowman*	BMOL MS	Conotoxin SPPS methods
Paul Phillips*	Chemistry MS	Conotoxin binding paradigm
Ashley Poppe	Chemistry MS	Enzymology – antibiotics
Nhu (Mila) Lam	Chemistry MS	Enzymology – antibiotics
Thomas Long	Computer Sci. & Engin. MS	DockoMatic algorithm creation
Casey Bullock	Computer Sci. & Engin. MS	DockoMatic software development
Emma Baker*	Chemistry MS	<i>In situ</i> NMR of parathion kinetics
Reed B. Jacob*	Interdisciplinary MS	Bioinformatics/DockoMatic usage
Amy Ulappa	Biology MS	Sage brush metabolomics
Brian Dies	Biology MS	Biofuel production
Jemima Monroe	Materials Science, Engin. MS	Materials characterization

\*Students mentored

## **COLLABORATORS**

Julie Oxford, Biological Sciences, Boise State University, Boise, ID

Lisa Warner, Chemistry and Biochemistry, Boise State University, Boise, ID

Matt King, Chemistry and Biochemistry, Boise State University, Boise, ID

Tim Andersen, Computer Science and Engineering, Boise State University, Boise, ID

Rao Kondamudi, Senior Scientist, BHS Specialty Chemical Products, Inc. Nampa, ID

James Groome, Biological Sciences, Idaho State University, Pocatello, ID

Jeffri Bohlscheid, Food Chemist, J. R. Simplot Company, Caldwell, ID

John Cort, Pacific Northwest National Laboratory, Richland, WA.

Ken Fujise, University of Texas Medical Branch, Galveston, TX.

Brian Blagg, Notre Dame, South Bend, IN.

Eric Bastian, Dairy West Inc., Twin Falls, ID.

Sergio Arispe, Oregon State University, Ontario, OR.

Brent Morgan, Emory University School of Medicine, Atlanta, GA.

Wendy Zomlefer, University of Georgia, Atlanta, GA.

Nigel Perry, University of Otago, Dunedin, New Zealand.

### **RESEARCH STUDENTS (2006-Present)**

<b><u>Student</u></b>	<b><u>Degree Path</u></b>	<b><u>Project</u></b>
Dorian Pittman	INBRE fellow	<i>Veratrum</i> alkaloid identification
Tyson Hardy	Chemistry, BS	Dairy protein spectroscopy
Caytee Hunt	Chemistry, BS	<i>Veratrum</i> alkaloid identification
Emily Wade	ACS SEED HS student	<i>Veratrum</i> alkaloid extraction
Ellie Hunt	Boise High School	<i>Veratrum</i> alkaloid extraction
Vannessa Campfield	Chemistry, BS	<i>Veratrum</i> alkaloid extraction
Meagan Rossi	Chemistry, BS	<i>Veratrum</i> alkaloid extraction & bioactivity
Vanessa Bowman	Biology, BA Technician BMOL MA	Onion slurry component identification Conotoxin peptide synthesis, folding, purification Conotoxin peptides
Aubrey Montebello	Chemistry, BS Technician	Green chemistry lab development Peptide synthesis, folding, purification
Paul Phillips	Chemistry, MS	Conotoxin drug development strategies
Roberto Cruz	Chemistry, BS (LSAMP)	<i>Veratrum</i> alkaloid extraction and bioactivity
Jacob Smith	Chemistry, BS	Fryer oil component identification
Jordan Orien	Chemistry, BS	DockoMatic computational screening
John French	Chemistry, BS	Fryer oil <i>trans</i> -fat determination by GC-FID
Jenny Fothergill	Chemistry, BS	<i>Veratrum</i> alkaloid extraction and identification
Jordan Elwell	Biology, BS	<i>Veratrum</i> alkaloid extraction and NMR structure
Ashton Bartlett	Biology, BS	<i>Veratrum</i> alkaloid extraction and NMR structure
Michael Katz	Biology, BS	Computational biochemistry
Sarah Lew	Biology, BS	Computational chemistry methodology
Nic Baughman	Interdisciplinary MS	<i>Veratrum</i> alkaloid bioactivity
Anna Nielsen	Chemistry, BS (REU)	Effect of pH on alkaloid extraction efficiency
Colin Sheffield	Biology: Pre-Med	Impact of instructional videos on student learning
Amanda Aman	Biology: Pre-Med	Organic lab practicum evaluation and assessment
Saige Harrington	Chemistry, BS	PTH hydrolysis mechanism by GC-MS
Belinda Stierman	Chemistry, BS	Plant secondary metabolites: sage brush
Savannah Rice	Chemistry, BS	Bioinformatics
Thomas Peavey	Biology, BS	Computational: Inverse virtual screening
Nicholas Baker	Biology, Pre-Dental	Computational: Collagen images in Blender
Andrew Remm	Biology, Pre-Med	Computational: Homology modeling & docking
Jared Mattos	Chemistry, BS	NMR alkaloid degradation studies
Mayra Estrada	Chemistry, BS (LSAMP)	Plant alkaloid extraction and characterization
Susana Jimenez	Chemistry, BS (REU)	Plant alkaloid extraction and
Chris Chandler	Pre-Med Technician	Plant alkaloid extraction and separation Alkaloid extraction, isolation, characterization



Ken Weekes	Biology, BS	Computational: Collagen/conotoxin
Petr Malek	Chemistry, BS	Green chemistry/steroidal alkaloid NMR
Jessica Brookhouse	Chemistry, BS	Plant alkaloid extraction and characterization
Erik Sheldon	Chemistry, BS	Conotoxin NMR $pK_a$ studies/alkaloid quantitation
Kathryn Ambrose	Chemistry, BS (REU)	Plant alkaloid extraction and separation
Emma Baker	Chemistry MS	NMR determination of parathion kinetics
Reed B. Jacob	Interdisciplinary MS	Bioinformatics; HTVS, software development
Emily Drussel	Chemistry, BS	Biphasic slice imaging NMR
Bryan Martin	Chemistry/Biology BS Technician	Biphasic slice imaging NMR Collagen XIa1 structure/function
David Luker	Biology BS	Biphasic slice imaging NMR
Luke Woodbury	Chemistry/Biology BS	Collagen XIa1 structure and function
Scotia Gonzales	Chemistry BS	Peptide synthesis, purification, biological activity
Chris Mallory	Chemistry BS	Bioinformatics
Andrew Narver	Biology BS	Conotoxin structure/function
Matthew Mirkin	Chemistry BS	OSpec Web
Seth Eidemiller	Pre-Med	Fuel briquettes, conotoxins, MTN metabolomics
Mark Swartz	Chemistry BS	Peptide NMR $pK_a$ , MTN metabolomics
Teslin Brasseur	Chemistry BS	Biphasic slice imaging NMR
Matthew Turner	Biology BS Biomolecular Ph.D.	Conotoxin structure/function Natural products bioactivity assay development
Logan Zemp	Chemistry BS	Conotoxin modeling
Andrew Ormond	Biology BS	Conotoxin modeling
Taylor Dixon	Chemistry BS	Biphasic slice imaging NMR
Dana Morocco	Biology BS	Fuel Briquettes
Blake Stanhouse	Biology BS	Fuel Briquettes
Paige Fetzer	Biology BS	Fuel Briquettes
Nick Weires	Chemistry BS (UofI)	Fuel Briquettes, Green Chemistry, Conotoxins
Ryan Morton	Biology BS	OSpec Web
Ben Parker	Chemistry BS	Biphasic slice imaging NMR
Josh Marshall	Biology BS	Collagen XIa1 modeling
Julie Napier	Chemistry BS (BYU-I)	Conotoxins

### **Postdoctoral fellows**

Matt King	2014-2016	FT-NIR analysis of potato fryer oil components
Rao Kondamudi	2014-2016	Recycle, recovery, repurposing of industrial food process fryer oil waste; new product development
Ashley Fisher	2012-2013	Industrial cleaner reverse engineering, product development, green chemistry