

# Benedict J. Kolber, Ph.D.

## Curriculum Vitae

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## Employment

### Duquesne University

Pittsburgh, Pennsylvania

**Associate Professor:** 7/2018 – Present

- Department of Biological Sciences ([www.duq.edu/biology](http://www.duq.edu/biology))

**Research and Education Coordinator:** 2/2012 – Present

- Chronic Pain Research Consortium ([www.duq.edu/pain](http://www.duq.edu/pain))

**Assistant Professor:** 12/2011 – 7/2018

- Department of Biological Sciences ([www.duq.edu/biology](http://www.duq.edu/biology))

## Education and Professional Experience

### Washington University in St. Louis

St. Louis, Missouri

**Post-Doctoral Research Fellow:** 11/2008 – 11/2011

Professor of Anesthesiology – Robert Gereau IV, Ph.D.

- Characterization of the central control of pain sensitization in mice with funding from the NIH (F32).

**Pre-Doctoral Student:** 8/2003 – 10/2008

(*Ph.D. in Neuroscience 2008*)

Professor of Pediatrics – Louis Muglia, M.D., Ph.D.

- Characterized the role of glucocorticoid receptors (GR) and corticotropin-releasing hormone (CRH) in both acute and chronic stress-related mouse behavior with funding from the NIH (F31).

*Teaching Citation (11/2008) – The Teaching Center & Graduate School of Arts and Sciences*

### University of Dayton

Dayton, Ohio

**Undergraduate Student:** 9/1999 – 5/2003

(*B.S. in Biology and Psychology (Minor: Chemistry)*)

## Research Interests

My broad interest is in understanding the mammalian behavioral and physiological responses to pain and stress. Within this broad area, we focus on the central amygdala in modulating chronic pain and anxiety. Studies looking at these questions involve investigation of molecular pathways in the amygdala, electrophysiological studies, optogenetics, animal behavior, and human translational studies.

## Peer-Reviewed Publications

<sup>UG</sup> denotes mentored undergraduate student; <sup>G</sup> denotes mentored graduate student; <sup>C</sup> denotes corresponding author

Polaski AM<sup>G</sup>, Phelps AL, Kostek MC, Szucs KA, & **B Kolber**<sup>C</sup> (2019). Exercise-induced hypoalgesia: A meta-analysis of exercise dosing for the treatment of chronic pain. *PLoS ONE* 14(1): e0210418. <https://doi.org/10.1371/journal.pone.0210418>.

Baktay J<sup>UG</sup>, Miller Neilan R<sup>C</sup>, Behun M<sup>UG</sup>, McQuaid N<sup>UG</sup>, & **B Kolber** (2019). Modeling neural behavior and pain during bladder distention using an Agent-based model of the central nucleus of the amygdala. *SPORA: A Journal of Biomathematics* 5(1): 1-13.

Lax N<sup>G</sup>, Parker SA, Hilton E<sup>UG</sup>, Seliman Y<sup>UG</sup>, Tidgewell K<sup>C</sup>, & **B Kolber**<sup>C</sup> (2018). Cyanobacterial extract with serotonin receptor subtype 7 (5-HT<sub>7</sub>R) affinity modulates depression and anxiety-like behavior in mice. *Synapse* 2018 Jul 10:e22059. doi: 10.1002/syn.22059.

Lax N<sup>G</sup>, Chen R, Leep S<sup>UG</sup>, Uhrich K, Yu L, & **B Kolber**<sup>C</sup> (2017). Polymorphine provides extended analgesic-like effects in mice with spared nerve injury. *Mol Pain*. 2017 Jan-Dec;13:1744806917743479. doi: 10.1177/1744806917743479.

- Sadler KE<sup>G</sup>, Gartland N<sup>UG</sup>, Cavanaugh J, & **BJ Kolber**<sup>C</sup> (2017). Central amygdala activation of extracellular signal-regulated kinase 1 and age-dependent changes in inflammatory pain sensitivity in mice. *Neurobiology of Aging*. Aug;56: 100-107. doi: 10.1016/j.neurobiolaging.2017.04.010.
- Sadler KE<sup>G</sup>, McQuaid NA<sup>G</sup>, Cox AC<sup>UG</sup>, Behun MN<sup>UG</sup>, Trouten AM<sup>UG</sup>, & **BJ Kolber**<sup>C</sup> (2017). Divergent functions of the left and right central amygdala in visceral nociception. *PAIN* April 2017 158(4): 747-759. doi: 10.1097/j.pain.0000000000000830
- Kostek M, Polaski A<sup>G</sup>, **Kolber B**, Ramsey A<sup>UG</sup>, Kranjec A & K Szucs (2016). A Protocol of Manual Tests to Measure Sensation and Pain in Humans. *J. Vis. Exp.* (118), e54130, doi:10.3791/54130 (2016).
- Lax N<sup>G</sup>, Morris J & **BJ Kolber**<sup>C</sup> (2016). A partial-flip classroom exercise in a large introductory general biology course increases performance at multiple levels. *Journal of Biological Education* Nov 2016: 1-15. <http://dx.doi.org/10.1080/00219266.2016.1257503>
- Long CC<sup>UG</sup>, Sadler KE<sup>G</sup> & **BJ Kolber**<sup>C</sup> (2016). Hormonal and molecular effects of restraint stress on formalin-induced pain-like behavior in male and female mice. *Physiol Behav* Oct 165: 278-285. doi: 10.1016/j.physbeh.2016.08.009. PMID: 27520589
- Wolz MJ<sup>UG</sup>, Sadler KE<sup>G</sup>, Long CC<sup>UG</sup>, Brenner D, Kim BS, Gereau IV RW & **BJ Kolber**<sup>C</sup> (2016). Post-inflammatory hyperpigmentation following human cold pain testing. *PAIN Reports* 1:e569. doi: 10.1097/PR9.0000000000000569.
- Kolber BJ**<sup>C\*</sup> Janjic J, Pollock J & K Tidgewell\* (2016). The Pain Undergraduate Research Experience: Interacting with community partners to build a specialized and enhanced biomedical research program. *BMC Medical Education* 2016 May 4;16(1):135. doi: 10.1186/s12909-016-0648-7  
\*Equal contribution
- Lax NC<sup>G</sup>, KT Ahmed, Ignatz CM<sup>UG</sup>, Spadafora C, **Kolber BJ**<sup>C</sup> & KT Tidgewell<sup>C</sup> (2016). Marine cyanobacteria-derived serotonin receptor 2C active fraction induces behavioral effects in mice. *Pharmaceutical Biology* 2016 May 14:1-9.
- Sadler KS<sup>G</sup> & BJ Kolber<sup>C</sup> (2016). Urine trouble: Alterations in brain function associated with bladder pain. *Journal of Urology* 2016 Feb 22. pii: S0022-5347(16)00365-7. doi: 10.1016/j.juro.2015.10.198.
- BJ Kolber**<sup>C</sup> (2015). mGluRs from head to toe in pain. *Progress in Molecular Biology and Translational Science*, 131: 281-324. doi: 10.1016/bs.pmbts.2014.12.003.; PMID: 25744677
- Kolber BJ**<sup>++</sup>, Konsolaki M<sup>++</sup>, Verzi MP, Wagner CR, McCormick JR, & K Schindler<sup>++</sup> (2014). Sex-specific differences in Meiosis: Real-world applications. *CourseSource* 00:xxx. doi:00.0000/journal.cs.000000; ++ equal contributions
- Lax NC<sup>G</sup>, George DC<sup>UG</sup>, Ignatz C<sup>UG</sup>, & **BJ Kolber**<sup>C</sup> (2014). The mGluR5 antagonist fenobam induces analgesic conditioned place preference in mice with spared nerve injury. *PLoS One* 2014 Jul 25;9(7):e103524.
- Nolan T, Geffert L<sup>G</sup>, **Kolber BJ**, Madura J, & Surratt C (2014). Discovery of novel-scaffold monoamine transporter ligands via in silico screening with the S1 pocket of the serotonin transporter. *ACS Chem Neurosci* Jul 15. PMID: 25003748.
- Sadler KS<sup>G</sup>, Stratton J<sup>UG</sup>, & **BJ Kolber** (2014). Urinary bladder distention evoked visceromotor responses as a model for bladder pain in mice. *J. Vis. Exp.* (86), e51413, doi:10.3791/51413.
- Sadler K<sup>G</sup>, Stratton J<sup>UG</sup>, DeBerry J, & **B Kolber** (2013). Optimization of a pain model: Effects of body temperature and anesthesia on bladder nociception in mice. *PLoS One* 2013 Nov 5;8(11):e79617.
- Kolber B**<sup>\*C</sup>, Crock L\*, Morgan C, Sadler K, Vogt S, Bruchas M & R Gereau IV (2012). Central amygdala mGluR5 in the modulation of visceral pain. *Journal of Neuroscience* 32(41): 14217-26.  
\*Co-first authors. Crock listed first on Pubmed.
- Dong H, Murphy K, Meng L, **Kolber B**, Zhang S, Holtzman D, Muglia L & J Csernansky (2012). Corticotrophin releasing factor accelerates neuropathology and cognitive decline in a mouse model of Alzheimer disease. *Journal of Alzheimer's Disease* 28(3): 579-92.

- Montana M, Conrardy B, Cavallone L, **Kolber B**, Rao L, Campbell M & R Gereau IV (2011). Metabotropic glutamate receptor 5 antagonism with fenobam: Examination of analgesic tolerance and side effect profile in mice. *Anesthesiology* Epub 2011 Oct 27.
- Kolber B** (2011). Extended problem-based learning improves scientific communication in senior biology students. *JCST Journal of College Science Teaching* 41(1): 32-39.
- Liu Q, Zhang J, Zerbinatti C, Zhan Y, **Kolber B**, Herz J, Muglia L & G Bu (2011). Lipoprotein receptor LRP1 regulates leptin signaling and energy homeostasis in the adult central nervous system. *PLoS Biol.* Jan 11; 9(1):e1000575.
- Kolber B**, Montana M, Carrasquillo Y, Xu J, Heinemann S, Muglia L & R Gereau IV (2010). Activation of metabotropic glutamate receptor 5 in the amygdala modulates pain-like behavior. *Journal of Neuroscience* 30(24): 8203-8213.
- Arnett M, **Kolber B**, Boyle M & L Muglia (2010). Behavioral insights from mouse models of forebrain- and amygdala-specific glucocorticoid receptor genetic disruption. *Molecular and Cellular Endocrinology*. Epub 2010 Nov 20.
- Kolber B**, Howell M, Wiczorek L, Kelley C, Onwuzurike C<sup>UG</sup>, Nettles S, Vogt S & L Muglia (2010). Transient early forebrain CRH elevation causes lasting anxiogenic and despair-like changes in mice. *Journal of Neuroscience* 30(7): 2571-2581.
- Kolber B** & L Muglia (2009). Defining brain region-specific glucocorticoid action during stress by conditional gene disruption in mice. *Brain Research* Oct 13;1293: 85-90. Epub 2009 Apr 8.
- Kolber B**, Roberts M, Howell M, Wozniak D, Sands M & L Muglia (2008). Central amygdala glucocorticoid receptor action promotes fear conditioning through a CRH-dependent network. *Proceedings of the National Academy of Sciences* 105(33): 12004-12009.
- Kolber B**, Wiczorek L & L Muglia (2008). Hypothalamic-pituitary-adrenal axis dysregulation and behavioral analysis of mouse mutants with altered glucocorticoid or mineralocorticoid receptor function. *Stress* 11(5): 321-328.
- Boyle M, **Kolber B**, Vogt S, Wozniak D & L Muglia (2006). Forebrain glucocorticoid receptors modulate anxiety-associated locomotor activation and adrenal responsiveness. *Journal of Neuroscience* 26(7): 1971-1978.

## **Current Funding**

**Title:** Investigation of cell-type specific contributions to bladder pain modulation in the central amygdala.

**Years of funding:** 2019 – 2022

**Funding agency:** NIH NIDDK

**Grant number:** NRSA 1F31-DK121484-01

**Role:** Faculty Sponsor (Heather Allen PI)

**Title:** Impact of amygdala lateralization on processing and modulation of bladder pain.

**Years of funding:** 2018 – 2023

**Funding agency:** NIH NIDDK

**Grant number:** 1R01-DK115478-01 A1

**Role:** Principal investigator

**Title:** CNS drug discovery from the ocean: Utilizing cyanobacteria to treat comorbid pain and depression

**Years of funding:** 2018 – 2021

**Funding agency:** NIH NCCIH

**Grant number:** NCCIH R15 AT008060-02

**Role:** co-Principal investigator (Kevin Tidgewell co-PI)

**Title:** Using ethnopharmacologic knowledge from Cameroon to develop novel Sigma 2 receptor agonists for pain treatment.

**Years of funding:** 2018 – 2019

**Funding Agency:** International Association for the Study of Pain

**Grant Number:** 2018 IASP Collaborative Research Grant

**Role:** Principal Investigator

**Title:** Pain and Neurodegenerative Undergraduate Research Experiences: Interacting with community partners to build specialized and enhanced neurologic disease programs for undergraduates.

**Years of funding:** 2018 – 2022

**Funding agency:** NIH (NINDS)

**Grant number:** 1R25-NS100118-A1

**Role:** Principal investigator (primary); co-PIs (Tidgewell, Cascio, Mihailescu)

**Title:** “Walking” OR Combining two known analgesic interventions (exercise & meditation) in a novel interaction study to treat patients with chronic pain.

**Years of funding:** 2017 – 2019 (NCE)

**Funding agency:** Clinical and Translational Science Institute, University of Pittsburgh and Virginia Kaufmann Foundation

**Grant number:** Pain Research Challenge

**Role:** co-Investigator (Kostek PI)

**Title:** A multi-continent collaboration in pain research and treatment: Using ethnopharmacological knowledge from Cameroon to develop novel pain treatments.

**Years of funding:** 2017 – 2018 (NCE)

**Funding agency:** Duquesne University Center for African Studies

**Grant number:** Rev. Alphons Loogman, C.S.Sp. Faculty Research Grant

**Role:** Principal Investigator

**Title:** Chronic pain research consortium interdisciplinary award.

**Years of funding:** 2014 – 2019 (NCE)

**Funding agency:** Duquesne University Office of the Provost

**Grant number:** Provost’s Interdisciplinary Research Consortia Grant

**Role:** co-Investigator (Jelena Janjic and John Pollock are co-PIs; Kevin Tidgewell is co-I)

### **Select Abstracts, Posters, and Oral Presentations**

<sup>UG</sup>denotes mentored undergraduate student; <sup>G</sup> denotes mentored graduate student; Presenter

Baktay J<sup>UG</sup>, Neilan R, Behun M<sup>UG</sup> & **BJ Kolber** (2018). “A computational model of the central nucleus of the amygdala during bladder pain.” Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium and Research Symposium April 11, 2018 (#153).

*Honorable Mention BSNES Poster Award (\$100)*

Riskus S<sup>UG</sup>, Polaski A, & **BJ Kolber** (2018). “Exploration of sex differences in experimentally induced inflammatory muscle pain.” Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium and Research Symposium April 11, 2018 (#101).

Polaski A<sup>G</sup>, Phelps A, Kostek M, Szucs K & **BJ Kolber** (2018). “Dose-dependent effect of moderate intensity exercise on sensitivity to pain in humans.” Poster presentation at the Duquesne University Graduate Student Research Symposium March 15, 2018 (#28).

Allen H<sup>G</sup>, Cox A & **BJ Kolber** (2018). “Behavioral characterization of cyclophosphamide-induced cystitis in mice.” Poster presentation at the Duquesne University Graduate Student Research Symposium March 15, 2018 (#16).

Behun M<sup>UG</sup>, McQuaid N<sup>G</sup>, Goldschmidt B & **BJ Kolber** (2017). Fabrication of a Timed-Pressure Regulator (TPR) to Enable the Study of Bladder Pain.” Poster presentation at the BMES 2017 Annual Meeting in Phoenix, AZ, Oct 14, 2017 (Abstract #3047). Refereed abstract.

Behun M<sup>UG</sup> & **BJ Kolber** (2017). Fabrication of a Timed-Pressure Regulator (TPR) to Enable the Study of Bladder Pain.” Poster presentation at the Icahn School of Medicine at Mount Sinai, NYC, NY, Sept 16, 2017.

*Winner of the 2017 Best Neuroscience Poster Award*

Parker S, **Kolber BJ** & K Tidgewell (2017). "Marine cyanobacteria, a source for lead compounds to treat pain and depression." Poster presentation at the American Society of Pharmacognosy annual meeting Portland, OR, July 30, 2017 (Abstract #P-232).

Leep S<sup>UG</sup>, Lax N<sup>G</sup>, Lei Y, Uhrich K & **BJ Kolber** (2017). "Investigating the Analgesic Properties of PolyMorphine." Poster presentation at the Annual Duquesne University Undergraduate Research Program Symposium in Pittsburgh, PA, July 28, 2017 (Abstract #145).

Cox A<sup>UG</sup>, Sadler K<sup>G</sup> & **BJ Kolber** (2017). "Characterizing neurophysiological mechanisms of chronic bladder pain regulation through the central amygdala." Poster presentation at the Annual Duquesne University Undergraduate Research Program Symposium in Pittsburgh, PA, July 28, 2017 (Abstract #146).

*PURE/NURE Reviewed Abstract Award – Won 2<sup>nd</sup> place prize for blinded peer-reviewed abstract (\$25).*

Zapadka A<sup>UG</sup>, Lax N<sup>G</sup>, Tidgewell K & **BJ Kolber** (2017). "Phylogenetic relationships of marine cyanobacteria serving as possible targets for pain and depression." Poster presentation at the Annual Duquesne University Undergraduate Research Program Symposium in Pittsburgh, PA, July 28, 2017 (Abstract #148).

*PURE/NURE Reviewed Abstract Award – Won 2<sup>nd</sup> place prize for blinded peer-reviewed abstract (\$25).*

Behun M<sup>UG</sup>, Goldschmidt B & **BJ Kolber** (2017). "Fabrication of a Timed-Pressure Regulator to Enable the Study of Bladder Pain." Poster presentation at the Annual Duquesne University Undergraduate Research Program Symposium in Pittsburgh, PA, July 28, 2017 (Abstract #150).

Baktay J, Neilan R, Behun M<sup>UG</sup> & **BJ Kolber** (2017). "A Computational Model of the Central Nucleus of the Amygdala during Bladder Pain." Poster presentation at the Annual Duquesne University Undergraduate Research Program Symposium in Pittsburgh, PA, July 28, 2017 (Abstract #156).

Sadler K<sup>G</sup>, Behun MN<sup>UG</sup>, McQuaid NA, Neilan R & **BJ Kolber** (2017). "Asymmetric nociceptive properties of the left and right central amygdala." Poster Presentation at the American Pain Society National Conference, Pittsburgh, PA, May 2017 (Abstract #108). *The Journal of Pain*, Vol. 18, Issue 4, S4.

Lax NC<sup>G</sup>, Hilton EJ<sup>UG</sup>, Ahmed T, Tidgewell KT & **BJ Kolber** (2017). "Understanding the role of serotonin receptor subtype 7 (5-HT7) in comorbid pain and depression using novel compounds derived from marine cyanobacteria." Poster Presentation at the American Pain Society National Conference, Pittsburgh, PA, May 2017 (Abstract #165). *The Journal of Pain*, Vol. 18, Issue 4, S17.

Zapadka A<sup>UG</sup>, Seliman Y<sup>UG</sup>, Hilton E<sup>UG</sup>, Lax NC<sup>G</sup>, Tidgewell KT & **BJ Kolber** (2017). "Phylogenetic Relationships of Cyanobacteria serving as Possible Targets for Pain." Poster Presentation at the American Pain Society National Conference, Pittsburgh, PA, May 2017 (Abstract #164). *The Journal of Pain*, Vol. 18, Issue 4, S17.

*Winner of the "Best in Show: Basic Science Poster" at the American Pain Society Annual Meeting.*

Polaski AM<sup>G</sup>, Kostek MC, Szucs KA & **BJ Kolber** (2017). "Dose-dependent effect of walking exercise on pressure pain in humans." Poster Presentation at the American Pain Society National Conference, Pittsburgh, PA, May 2017 (Abstract #454). *The Journal of Pain*, Vol. 18, Issue 4, S87.

Parker S, **Kolber BJ** & K Tidgewell (2017). "Screening extracts of marine cyanobacteria for lead compounds to treat pain." Poster Presentation at the American Pain Society National Conference, Pittsburgh, PA, May 2017 (Abstract #163). *The Journal of Pain*, Vol. 18, Issue 4, S17.

Behun M<sup>UG</sup>, McQuaid NA<sup>G</sup>, & **BJ Kolber** (2017). "Approaching neuroscience using an engineering view." Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium (URSS), April 2017 (Abstract 7). Poster presentation at the University of Pittsburgh BioE Day, April 2017.

*URSS – Phi Kappa Phi National Honors Society Outstanding Research Award (\$500)  
Pitt BioE Day – First Prize in the Undergraduate Category (\$200)*

Cox A<sup>UG</sup>, Lax N<sup>G</sup>, Welsh W, Peng Y & **BJ Kolber** (2017). "A Comparative Study of Two Analgesic Compounds, Fenobam Sulfate and Fenobam Free Base, Using a Model of Inflammatory Nociception." Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium, April 2017 (Abstract 17). Poster presentation at the American Physiological Society Experimental Biology Meeting, Chicago, IL April 2017 (#D23 812.8).

*URSS – Office of Research for Outstanding Poster Award (\$125)*

Hilton E<sup>UG</sup>, Staub C, Lax N<sup>G</sup>, **Kolber BJ** & K Tidgewell (2017). "Discovery of a poly-halogenated compound from a Curacao cyanobacteria." Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium, April 2017 (Abstract #43).

Szucs KA, Polaski A<sup>G</sup>, Kostek MC, **Kolber BJ**, & A Kranjec. *Dosing Exercise to Treat Pain: A Randomized Human Trial*. Poster Presentation at the 2016 ACRM National Conference, Chicago, IL, November 2016. *Archives of Physical Medicine and Rehabilitation*, 97(10), e67.

**Kolber BJ**, Sadler K<sup>G</sup> & N McQuaid<sup>G</sup> (2016). "Functional differences between left and right cerebral hemisphere control of bladder pain." Poster presentation at the IASP World Congress, Yokohama, Japan, September 28, 2016

Sadler K<sup>G</sup> & **BJ Kolber** (2016). "Asymmetric modulation of bladder pain by the left and right central amygdala." Poster presentation at the American Pain Society Annual Meeting in Austin, TX, May 11-14, 2016 (Abstract #375 *The Journal of Pain*, Vol. 17, Issue 4, S68–S69).

Cox A<sup>UG</sup>, Sadler K<sup>G</sup>, & **BJ Kolber** (2016). Modeling chronic bladder pain in male and female mice: Exploring the chronicity of repeated cyclophosphamide injections. Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium, Duquesne University April 6, 2016 (abstract #65).

*Outstanding Scholarship Award from the Provost and Honorable Mention BSNES Poster Award*

Hilton E<sup>UG</sup>, Tidgewell K & **BJ Kolber** (2016). "Investigation of a cyanobacterial collection from Curacao for CNS activity." Poster for presentation at the Experimental Biology ASPET 2016 meeting in San Diego, April 4, 2016 (Abstract # 763).

*Recipient of Undergraduate Travel Award from ASPET (\$1000)*

Wolyniak MJ, Prunuske AJ, Adler JJ, Crowe AJ, Keller LC, **Kolber BJ**, Leland BA, Schreiner SM, Whatley Z & SM Wick (2015). "Spreading Vision and Change through faculty mentorship: The ASCB Mentoring in Active Learning and Teaching (MALT) program. Poster presentation at the American Society of Cell Biology in San Diego, CA, Dec 12-16, 2015).

Sweetnich RR, Polaski AM<sup>G</sup>, Kostek MC, **Kolber BJ**, & KA Szucs (2015). "A new prescription for pain management in humans: Does exercise dose matter?" Poster presentation at the Mid-Atlantic Regional Chapter of the American College of Sports Medicine 38<sup>th</sup> Annual Scientific Meeting Nov 6-7, 2015, Harrisburgh, PA. *International Journal of Exercise Science: Conference Proceedings*: Vol. 9: Iss. 4, Article 99. <http://digitalcommons.wku.edu/ijesab/vol9/iss4/99>

McQuaid N<sup>G</sup> & **BJ Kolber** (2015). "Extracellular recording of bladder pain neurons in the amygdala." Poster presentation at the Duquesne University Graduate Student Research Symposium Nov 6, 2015.

Sadler K<sup>G</sup>, Trouten A<sup>UG</sup>, & **BJ Kolber** (2015). "Asymmetrical involvement of the left and right central amygdala in bladder pain." Poster presentation at the Duquesne University Graduate Student Research Symposium Nov 6, 2015.

*Poster won Bayer School Award for Top Poster*

Lax N<sup>G</sup>, Ignatz C<sup>UG</sup>, Hilton E<sup>UG</sup>, Ahmed T, Tidgewell K, & **BJ Kolber** (2015). "Understanding the role of serotonin receptor subtypes 7 and 2C (5-HT<sub>7</sub>/2C) in comorbid pain and depression using novel compounds derived from marine cyanobacteria." Poster presentation at the Annual Society for Neuroscience Meeting, Faculty for Neuroscience Poster Session, Chicago, IL Oct 17-21, 2015 (Abstract #635.21).

Sadler K<sup>G</sup>, Trouten A<sup>UG</sup>, & **BJ Kolber** (2015). "Asymmetrical involvement of the left and right central amygdala in bladder pain." Poster presentation at the Annual Society for Neuroscience Meeting, Faculty for Neuroscience Poster Session, Chicago, IL Oct 17-21, 2015 (Abstract #238.12).

Long C<sup>UG</sup>, Sadler K & **BJ Kolber** (2015). "Analysis of Sex-Based Differences in a Mouse Model of Stress-Induced Analgesia." Poster presentation at the Annual Society for Neuroscience Meeting, Faculty for Neuroscience Poster Session, Chicago, IL Oct 17-21, 2015.

Polaski A<sup>G</sup>, Ramsey A<sup>UG</sup>, Szucs KA, Kostek MC & **BJ Kolber** (2015). "Reliability of cost-effective human quantitative sensory testing for pain." Poster presentation at the Center for Neuroscience at the University of Pittsburgh Annual Retreat at Oglebay Resort, WV September 11-13, 2015.

Sadler K<sup>G</sup>, Trouten A<sup>UG</sup>, & **BJ Kolber** (2015). "Hemispheric lateralization of bladder pain modulation." Poster presentation at the Center for Neuroscience at the University of Pittsburgh Annual Retreat at Oglebay Resort, WV September 11-13, 2015.

Lax N<sup>G</sup>, Hilton T<sup>UG</sup>, Ahmed T, Tidgewell K, & **BJ Kolber** (2015). "Characterization of serotonin receptor subtype 7 (5-HT7) in pain and depression using novel compounds derived from marine cyanobacteria." Poster presentation at the Center for Neuroscience at the University of Pittsburgh Annual Retreat at Oglebay Resort, WV September 11-13, 2015.

*Poster won the best Predoctoral Poster prize at the retreat*

Cox A<sup>UG</sup>, Lax N<sup>G</sup>, Peng Y, Welsh W & **B Kolber** (2015). "Extended pain relieving effects of fenobam sulfate, a non-opioid analgesic, in a mouse model of inflammatory pain." Poster presentation at the Annual Duquesne University Metals in Biology Symposium in Pittsburgh, PA, September 25, 2015.

*Poster won 2<sup>nd</sup> Place Poster prize at the symposium*

Sadler K<sup>G</sup>, Trouten A<sup>UG</sup>, & **BJ Kolber** (2015). "Hemispheric lateralization of bladder pain modulation." Poster presentation at the Department of Biological Sciences Retreat at Pymatuning Research Station, September 21-22, 2015.

*Poster won the best Predoctoral Poster prize at the retreat*

Sadler K<sup>G</sup>, Trouten A<sup>UG</sup>, & **BJ Kolber** (2015). "Hemispheric lateralization of bladder pain modulation." Poster presentation at the American Pain Society Annual Meeting in Palm Springs, CA, May 13-16, 2015 (Abstract #359 *The Journal of Pain*, 16(4), S1: S65).

Lax N<sup>G</sup>, Hilton T<sup>UG</sup>, Ahmed T, Tidgewell K, & **BJ Kolber** (2015). "Characterization of serotonin receptor subtype 7 (5-HT7) in pain and depression using novel compounds derived from marine cyanobacteria." Poster presentation at the American Pain Society Annual Meeting in Palm Springs, CA, May 13-16, 2015 (Abstract #293 *The Journal of Pain*, 16(4), S1: S49).

Wolz M<sup>UG</sup>, Long C<sup>UG</sup>, & **BJ Kolber** (2015). "Cold cutaneous assay: A novel method to measure cold sensitivity in humans." Poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium, Duquesne University April 9, 2015 (abstract #98).

Tidgewell K, Ahmed KT, Lax N<sup>G</sup> & **BJ Kolber** (2015). "Panamanian marine cyanobacterial extracts with in vivo activity in models of anxiety and depression." *Planta Med*; 81 – IL17 DOI: 10.1055/s-0035-1556114

Gulli A<sup>HS</sup>, Sadler K<sup>G</sup> & **BJ Kolber** (2015). "Location of pERK and CRH in the central nucleus of the amygdala (CeA)." Poster presentation at the STEM-ulate Science Showcase at the University of Pittsburgh, March 28, 2015.

Lax N<sup>G</sup>, Hilton E<sup>UG</sup>, Ahmed K, Tidgewell KJ & **BJ Kolber** (2014). Characterization of serotonin receptor subtype 2C (5-HT2C) in pain and depression using novel compounds derived from marine cyanobacteria. Poster presentation at the Annual Society for Neuroscience 2014 Washington D.C. Nov. 18, 2014 (527.17/EE7).

Ahmed KhT, Lax N<sup>G</sup>, **Kolber BJ** & KJ Tidgewell (2014). Discovery of a 5-HT2c GPCR Ligand from a Panamanian Cyanobacterium. Poster presentation at the 55<sup>th</sup> Annual Meeting of the American Society of Pharmacognosy, Oxford, MS, August 2-6, 2014.

Ignatz CM<sup>UG</sup>, Lax N<sup>G</sup>, Tidgewell K & **BJ Kolber** (2014). "Pain, Depression, and Anxiety Modulation through a Novel CNS Active Marine Cyanobacterial Compound." Poster presentation at the Tri-Beta National Convention at Gannon University in Erie Pennsylvania, June 3-7, 2014.

- Kolber BJ** (2014). "Using optogenetics to dissect higher brain control of bladder pain." Oral presentation symposium at the American Pain Society Annual meeting Tampa Bay, FL May 1, 2014. Symposium entitled "Optogenetics in Pain." Symposium proposal was organized and submitted by me and was chosen in a competitive peer-reviewed process.
- Kolber BJ** (2014). "Fiat lux." Oral presentation symposium at the American Pain Society Annual meeting Tampa Bay, FL May 1, 2014. Symposium entitled "Optogenetics in Pain." Symposium proposal was organized and submitted by me and was chosen in a competitive peer-reviewed process.
- Ignatz CM<sup>UG</sup>, Lax N<sup>G</sup>, Tidgewell K, and **BJ Kolber** (2014). "Depression, Pain, and Anxiety Modulation through a Novel CNS Active Marine Cyanobacteria Compound." Submitted for poster presentation at the Duquesne University Undergraduate Research and Scholarship Symposium, Duquesne University April 9, 2014.  
*Awarded the "Excellence in Research in the Basic Sciences Award" sponsored by the Bayer School of Natural and Environmental Science. (\$300 cash prize)*
- Ignatz CM<sup>UG</sup>, Lax N<sup>G</sup>, Tidgewell K, and **BJ Kolber** (2014). "Depression, Pain, and Anxiety Modulation through a Novel CNS Active Marine Cyanobacteria Compound." Submitted for poster presentation at the Tri-Beta District Convention at Grove City College in Grove City Pennsylvania, March 29, 2014.  
*Awarded the "John C. Johnson Award for Excellence in Student Research" for a first place poster (Free travel to National Tri-Beta Conference).*
- Sadler KE<sup>G</sup>, Stratton JM<sup>UG</sup>, **BJ Kolber** (2013). "Effects of body temperature and isoflurane induction on urinary bladder distention." Submitted for poster presentation at the Annual Society for Neuroscience 2013 meeting in San Diego, CA, Nov 9 -13, 2013 (Abstract # 643.13).
- George DC<sup>UG</sup>, Lax NC<sup>G</sup>, **BJ Kolber** (2013). "The mGluR5 antagonist fenobam induces analgesic conditioned place preference in mice with spared nerve injury." Submitted for poster presentation at the Annual Society for Neuroscience 2013 meeting in San Diego, CA, Nov 9 -13, 2013 (Abstract # 369.10).
- Geffert LM<sup>G</sup>, Ross RR, Nolan TL, **Kolber BJ**, Madura JD, CK Surratt (2013). "Discovery of monoamine transporter ligands via virtual screening with the S1 substrate pocket of the serotonin transporter." Submitted for poster presentation at the Annual Society for Neuroscience 2013 meeting in San Diego, CA, Nov 9 -13, 2013 (Abstract # 227.10).
- Lax N<sup>G</sup>, George D<sup>UG</sup>, **B Kolber** (2013). "The mGluR5 antagonist fenobam works as a non-rewarding analgesic in female mice with spared nerve injury." Submitted for poster presentation at the Midwest Pain Interest Group at the University of Cincinnati Aug 23-24, 2013.
- Sadler KE<sup>G</sup>, Stratton JM<sup>UG</sup>, **B Kolber** (2013). "Optimization of Temperature and Anesthesia Induction Method on UBD-VMR Mouse Model of Bladder Pain." Submitted for poster presentation at the Midwest Pain Interest Group at the University of Cincinnati Aug 23-24, 2013.
- B Kolber** (2013). "Lateralization of amygdala function in modulating pain." Submitted for poster presentation at the "Amygdala in Health and Disease" Gordon Conference, July 28 – Aug 1, 2013.
- Sadler K<sup>G</sup>, Stratton J<sup>UG</sup>, **B Kolber** (2013). "Effects of temperature, anesthesia, and infection on urinary bladder pain-like responses in mice." Submitted for presentation at the Experimental Biology 2013 meeting in Boston, April 20-24, 2013 (Abstract # 691.16 Page 207).
- Kolber B**, Crock L, Morgan C, Sadler K<sup>G</sup>, Vogt S, Bruchas M, R Gereau IV (2012). "Central amygdala mGluR5 in the modulation of visceral pain." Submitted for poster presentation at the Annual Society for Neuroscience 2012 meeting in New Orleans, Oct 13-17, 2012 (Abstract # 473.19).
- George D<sup>UG</sup> & **B Kolber** (2012). "Inhibition of metabotropic glutamate receptor 5 reduces on-going spontaneous pain as measured by conditioned place preference in mice." Submitted for oral presentation at the Midwest/Great Lakes Undergraduate Research Symposium in Neuroscience in Wooster, OH, Sept 29, 2012.
- Kolber B** (2012). "Optogenetic activation of the amygdala in mice increases bladder "pain-like" responses." Oral presentation at the 2012 American Pain Society Annual Meeting in Honolulu, HI, May 16, 2012.
- Kolber B** (2011). "Modulation of somatic versus visceral sensation by the amygdala." Oral presentation at the 2011 Midwest Pain Interest Group Meeting in Chicago, IL, July 23, 2011.



- Kolber B**, Montana M, Carrasquillo Y & R Gereau IV (2010). "Activation of metabotropic glutamate receptor 5 in the amygdala modulates pain-like behavior." Poster presentation at the 2010 Midwest Pain Interest Group Meeting in Indianapolis, IN, June 18, 2010.
- Kolber B**, Howell M, Kelley C, Vogt S & L Muglia (2008). "Transient early forebrain CRH overexpression causes lasting angiogenic changes in the adult mouse." Poster presentation at the Annual Society for Neuroscience 2008 meeting in Washington D.C., Nov. 15-19, 2008 (Abstract # 477.20/QQ19).
- Kolber B**, Nunez M, Sands M & L Muglia (2007). "Amygdalar glucocorticoid receptor disruption attenuates emotional learning." Poster presentation at the Annual Society for Neuroscience 2007 meeting in San Diego, Nov. 2-7, 2007 (Abstract # 101328/628.1).
- Kolber B**, Key M, Chen Y, Morris M & C Krane (2003). "Aquaporin 4 mRNA expression in mouse brain is induced in response to dehydration." Poster presentation at the Experimental Biology 2003 meeting in San Diego, April 11-15, 2003 (Abstract # 586.2 Page A919) and presentation at the 2003 University of Dayton Stander Symposium, March 4-5, 2003.
- Kolber B** & C Kimble (2003). "Investigating feminism: Urban vs. rural women in Cameroon, West Africa." Poster presentation at the 2003 University of Dayton Stander Symposium, March 4-5, 2003.

## **Research Mentoring**

### **Mentoring of graduate students**

Duquesne University 1/2012 – Present

- Thesis research mentor to five Ph.D. students in the Department of Biological Sciences.
- Research mentor to two M.S. students in the Department of Biological Sciences
- Rotation research mentor to seven Ph.D. students in the Department of Biological Sciences

### **Mentoring of undergraduate students**

Duquesne University 12/2011 – Present

- Research mentor to 28 undergraduate students in the Department of Biological Sciences.
  - Three students successfully applied for and received American Physiological Society Summer Undergraduate Research Fellowship (2012; 2016; 2018).
  - Two students successfully applied for and received Tri-Beta Undergraduate Research Award (2013; 2017).
  - Two students successfully applied for and received Irene and Eric Simon Brain Research Foundation Fellowships in Neuroscience (2014; 2017).
  - 13 students successfully applied for and received Duquesne Undergraduate Research Program awards (Summer 2012; Summer 2013; Summer 2014; Summer 2015; Summer 2016; Summer 2017; Summer 2018).

Washington University in St. Louis 2/2009 – 10/2010 and 8/2007 – 11/2008

- Research mentor to undergraduate students in the labs of Louis Muglia, M.D./Ph.D. and Robert Gereau, IV Ph.D.
  - Two students successfully applied for and received HHMI/Washington University Summer Undergraduate Research Fellowships (2008 and 2009).

University of Dayton 8/2002

- Research mentor to visiting undergraduate students in the lab of Carissa Krane, Ph.D.

## **Select Media Coverage**

- "Pharmacognosy Field Notes: Random Encounter Leads to Cameroon Adventure" *American Society of Pharmacognosy Fall 2017 Newsletter Vol 53 Issue 3* 10/24/2017 written by: Dr. Kevin Tidgewell
- "2017 Distinguished Dissertation Award Winners Announced" *Duquesne University Times* 6/28/2017 <https://applications.duq.edu/times/2017/06/2017-distinguished-dissertation-award-winners-announced/>
- "Newsmaker: Abigail Cox" *TRIB Live Newsmaker Section* 4/8/2016 <http://triblive.com/mobile/10206846-96/cox-pain-biology>

- “Duquesne Chronic Pain Research Consortium Undergraduate Wins National Fellowship” *Duquesne University News* 4/6/2016 <http://duq.edu/news/duquesne-chronic-pain-research-consortium-undergraduate-wins-national-fellowship>
- “National Funding Continues to Support Doctoral Biology Student” *Duquesne University Times* 10/28/2015 <http://applications.duq.edu/times/2015/10/national-funding-continues-to-support-doctoral-biology-student/>
- “A week in Curacao, a year of analysis for Chronic Pain Research members” *Duquesne University Times* 8/12/2015 <http://applications.duq.edu/times/2015/08/a-week-in-curacao-a-year-of-analysis-for-chronic-pain-research-members/>
- “Pain response may differ in males, females” CBS News 6/30/2015 <http://www.cbsnews.com/news/pain-responses-differ-gender-male-female/>
- “Duquesne Summer Program hits record turnout” 6/9/2015 [http://www.icontact-archive.com/J0IA9rS2048SGwaCDHxk\\_0SLuPRJTYSa?w=4](http://www.icontact-archive.com/J0IA9rS2048SGwaCDHxk_0SLuPRJTYSa?w=4)
- “Summer Undergraduate Research Program Hits Historic High” *Duquesne University Times* 6/3/2015 <http://applications.duq.edu/times/2015/06/summer-undergraduate-research-program-hits-historic-high/>
- Pain Research Forum “Closing the sex gap in preclinical pain research.” 5/27/2015; contribute quote as moderator and lead for debate at APS <http://painresearchforum.org/forums/discussion/54434-closing-sex-gap-preclinical-pain-research>
- MedScape “Abuse Risk Evaluation Changes Opioid Prescribing” 5/15/2015; contribute quote as moderator of APS symposium <http://www.medscape.com/viewarticle/844734>
- University of Dayton Department of Biology Alumni Profile 4/29/2015 [https://www.udayton.edu/artsscience/academics/biology/alumni/alumni\\_profiles/kolber.php](https://www.udayton.edu/artsscience/academics/biology/alumni/alumni_profiles/kolber.php)
- “Duquesne Undergrad Recognized with Prestigious Science Award” *Duquesne University Times* 3/18/2015 <http://applications.duq.edu/times/2015/03/duquesne-undergrad-recognized-with-prestigious-science-award/>
- “Faculty Recognized for Excellence in Student-Learning Assessment” *Duquesne University Times* 12/17/2014 <http://applications.duq.edu/times/2014/12/faculty-recognized-for-excellence-in-student-learning-assessment/>
- “Hempfield Grad Making Her Mark in Health Research” *TribLive* 12/11/2014 <http://triblive.com/neighborhoods/yourhempfield/yourhempfieldmore/7296609-74/research-sadler-award#axzz3Lgg27IV5>
- “University Garners First NIH NRSA Fellowship for Graduate Student” *Duquesne University Times* 11/13/2014 <http://applications.duq.edu/times/2014/11/university-garners-first-nih-nrsa-fellowship-for-graduate-student/>
- Contributed content to article “The Science of Scare” in The Duquesne Duke newspaper (<http://www.duqsm.com/the-science-of-scare/>) 10/30/2014
- Commentary on *UroToday.com* “Optimization of a pain model: Effects of body temperature and anesthesia on bladder nociception in mice, “Beyond the Abstract,” by Katelyn Sadler and Benedict J. Kolber, PhD ([http://urotoday.com/index.php?Itemid=818&option=com\\_content&view=article&catid=1149&id=76242](http://urotoday.com/index.php?Itemid=818&option=com_content&view=article&catid=1149&id=76242)) 10/30/2014
- “Chronic pain research consortium explores pain and its impact on everyday lives” in The Pittsburgh Catholic Senior Living Supplement by Karen Ferrick-Roman 10/24/2014
- “Unraveling the mysteries of pain.” *Duquesne University Magazine Fall 2014* ([http://www.duq.edu/Documents/public-affairs/magazine/\\_pdf/DU%20Mag%20Fall%202014.pdf](http://www.duq.edu/Documents/public-affairs/magazine/_pdf/DU%20Mag%20Fall%202014.pdf))
- Commentary on *UroToday.com* “Urinary bladder distention evoked visceromotor responses as a model for bladder pain in mice, “Beyond the Abstract,”” by Katelyn Sadler and Benedict J. Kolber, PhD (<http://www.urotoday.com/Interstitial-Cystitis-/Painful-Bladder/urinary-bladder-distention-evoked-visceromotor-responses-as-a-model-for-bladder-pain-in-mice-beyond-the-abstract-by-benedict-j-kolber-phd.html>) 9/16/2014
- Interview for People Behind the Science podcast. Episode 033: Dr. Ben Kolber: “No Pain, No Gain in the Research of Chronic Pain Mechanisms.” <http://www.peoplebehindthescience.com/dr-ben-kolber/#more-304> 5/8/2014
- “Member spotlight: Benedict J. Kolber, Ph.D.” *American Pain Society September E-News* (Monthly newsletter for the American Pain Society). September 2013 (<http://www.americanpainsociety.org/enews/2013/september.html#aps5>)
- “Bayer School Students Engaged with Research.” *Spectrum* (Newsletter for Bayer School of Natural and Environmental Sciences). Spring 2013 (<http://apps.duq.edu/spectrum/bayer-research.cfm>)
- Radio interview on KQV a.m. with Bob Bartolomeo about bladder research 12/19/2012
- “Kolber and team report breakthrough in painful bladder syndrome.” *Duquesne University Times* 12/19/2012 (<http://applications.duq.edu/times/2012/12/kolber-and-team-report-breakthrough-in-painful-bladder-syndrome/>)

- “Summer workshop will help students think like scientists.” *Spectrum* (Newsletter for Bayer School of Natural and Environmental Sciences). Winter 2012 (<http://apps.duq.edu/spectrum/summer-workshop.cfm>)
- “Biology department welcomes new professor, Dr. Benedict Kolber.” *Spectrum* (Newsletter for Bayer School of Natural and Environmental Sciences). Fall 2012 (<http://apps.duq.edu/spectrum/kolber.cfm>)
- “National fellowship funds Duquesne undergraduate researcher of chronic pain.” *Duquesne University Newsroom* May 7, 2012 (<http://newsroom.duq.edu/2012/05/07/national-fellowship-funds-duquesne-undergraduate-researcher-of-chronic-pain/>)
- “Three R’s”. *University of Dayton Biology Department Newsletter* Fall 2010.
- “Baby Blues”. *Nature* 463 Feb 25 2010: 1002. Comment on Kolber et al, 2010 *Journal of Neuroscience* 30(7).
- Faculty of 1000 Biology – “Must Read” Kolber et al, 2010 *Journal of Neuroscience* 30(24).
- Faculty of 1000 Biology – “Exceptional” Kolber et al, 2008 *Proceedings of the National Academy of Sciences* 105(33).

## **Professional Service**

- American Pain Society Nominating Committee (2018-Present)
- American Physiological Society Judge at Intel International Science Fair (2018)
- International Association for the Study of Pain Fellowships, Grants, and Awards Working Group (FGAWG) (2016-Present)
- Ad-hoc NIH Study Section Reviewer (2015-Present)
- Council on Undergraduate Research Reviewer for “posters on the hill” (2015-2017)
- NIH Early Career Reviewer Program (SCS) (2015)
- *Biology: How Life Works* textbook reviewer and consultant (2014-Present)
- American Pain Society Basic Science SIG co-chair (2013-2015)
- Ad-hoc reviewer misc peer-review journals (2011-Present)

## **Awards, Honors & Affiliations**

- Early Career Mentoring Award from the Biology Division of the Council of Undergraduate Research (CUR) – Honorable Mention (11/2015)
- Mentoring Active Learning and Teaching”(MALT) Award for early career educators from the American Society for Cell Biology (11/2014)
- Student-Learning Assessment Award from the Duquesne University Office of the Provost for assessment of Department of Biological Sciences Mentoring program – Award to Drs. Benedict Kolber and Joseph McCormick (10/2014)
- Mentor Award for Excellence in Advising Graduate Students from the Department of Biological Sciences, Duquesne University (4/23/2014)
- International Association for the Study of Pain and Scan|Design Foundation by Inger and Jens Bruun Early Career Investigator Award (2013-2014)
- National Academies Education Fellow in the Life Sciences (2012-2013)
- NINDS Ruth L. Kirschstein Postdoctoral F32 NRSA (2/2010 – 11/2011)
- Member of the American Pain Society (2011 – Present)
- Member of Faculty for Undergraduate Neuroscience (2010 – Present)
- Member of National Science Teachers Association (2010 – Present)
- John Merlie Fellowship, Washington University (2009)
- SFN Chapter Graduate Student Travel Award (2007)
- NIMH Ruth L. Kirschstein Predoctoral F31 NRSA (7/2006 – 10/2008)
- Lucille P. Markey Special Pathway in Human Pathobiology Fellow, Washington University (2004 – 2005)
- Member of Society for Neuroscience (2004 – Present)
- Dean Leonard Mann Award to the Outstanding Graduate in the School of Arts and Sciences (2003)
- John E. Dlugos Jr. Memorial Award of Excellence to the Outstanding Senior Major in Biology (2003)
- 2002 American Physiological Society Undergraduate Summer Research Award (2002)
- Member of American Physiological Society (2002-2008; 2012 – Present)
- Cordell Hull International Fellow Award for psychology research in Cameroon, Africa, University of Dayton (2002)
- Leopold W. Like, M.D. Scholars Award, University of Dayton (2002)
- Learn, Lead and Serve Award for undergraduate research, University of Dayton (2001)
- Scholars Program, University of Dayton (1999 – 2003)