Katerina Zorina-Lichtenwalter

Contact Information	275 S Cherokee Street, Apt. 3205 Denver, CO 80223	*Phone:* +1-720-277-4465 *E-mail:* augmntd4th@gmail.com

Education

McGill University, Montreal, QC, Canada

Ph.D., Neuroscience, October 2019

- Thesis Topic: *Informed combinations: common genetic variants in MC1R and P2RX7 and their effects on pain phenotypes*
- Adviser: Luda Diatchenko

Catholic University of America, Washington, D.C., USA

M.A., Musicology, May 2009

- Thesis Topic: *Elgar's unintentional modernism: the aesthetics of captivity in the Cello Concerto*
- Adviser: Andrew Weaver

University of Notre Dame, Notre Dame, Indiana, USA

Independent Coursework, January 2011-May 2012

- Organic Chemistry I (CHEM 10172) and II (CHEM 20273)
- Molecular Biology I (BIOS 60531)
- Principles of Biochemistry, (CHEM 60520)

M.A., French Language and Literature, May 2006

B.A., French, May 2005

- *cum Laude*

B.A., Music, May 2005

- Specialization: *Clarinet Performance*
- *cum Laude*

Languages

English (fluent), Russian (fluent), French (advanced), German (beginner), Spanish (beginner)

Skills and Programming Languages

Excel (proficient), Bash (intermediate), R (intermediate), LaTeX (intermediate), Python (intermediate), MATLAB (intermediate); SQL (beginner) Visualization libraries/packages (ggplot, matplotlib)

Operating Systems

Linux Mint, macOS, Windows

Professional Experience

University of Colorado, Boulder, Colorado USA

Postdoctoral Researcher **March 2020 to Present**

- Institute for Behavioral Genetics
- Conduct statistical genetic analyses of pain and psychological conditions
- Use R, Bash, PLINK, BOLT-LMM, and Regenie
- Present at international scientific research conferences and write articles for publication in peer-reviewed journals

McGill University, Montreal, Quebec Canada

Postdoctoral Researcher **September 2019 to December 2019**

- Laboratory of Luda Diatchenko, Alan Edwards Centre for Research on Pain
- Conducted statistical association analyses of human genetic variants and pain conditions
- Used R, Bash, Plink, BOLT, and Haploview

University of Notre Dame, Notre Dame, Indiana USA

Research Assistant **June 2012 to July 2013**

- Laboratory of Mayland Chang, Department of Chemistry and Biochemistry
- Conducted enzyme kinetics (fluorometric) assays to establish inhibition profiles for compounds with the potential to inhibit matrix metalloproteinases (MMPs) involved in diabetic wound healing, idiopathic pulmonary fibrosis, sepsis and cancer
- Conducted *in vitro* studies to establish pharmacokinetic parameters for MMP inhibitors; developped LC-MS, LC-MRM, and LC-MS/MS methods for compound quantification and metabolite identification
- Conducted assays with potential antibiotic compounds (oxadiazoles): hemolysis and analysis by UV spectroscopy
- Performed protein purification: bacterial lytic transglycosylases

University of Notre Dame, Notre Dame, Indiana USA

Lab Assistant **November 2011 to June 2012**

- Laboratory of Mayland Chang, Department of Chemistry and Biochemistry
- Conducted assays with potential antibiotic compounds (oxadiazoles): hemolysis and analysis by UV spectroscopy; protein-binding and analysis by LC-MS/MS
- Conducted assays with compounds shown to be effective in Alzheimer's Disease treatment: compound stability in S9 rat liver microsomes and human plasma, analyzed by mass spectrometry, and metabolite identification by LC-MS/MS

Office of the Dean of Science, University of Notre Dame, South Bend, Indiana USA

Senior Administrative Assistant **August 2009 to June 2012**

- Provided any necessary administrative support to the dean and his staff
- Organized two meetings of the annual Parseghian Conference for Niemann-Pick Type C Research (2011 and 2012)

Refereed Journal Publications

Zorina-Lichtenwalter, K.; Bango, C.I.; Čeko, M.;Keller, M.C.; Wager, T.D.; Friedman, N.P. Genetic relationships between cross-condition chronic pain, psychopathologies, and neuroticism. *In Submission.*

Zorina-Lichtenwalter, K.; Ase, A.R.; Verma V.; Parra A.I.M.; Komarova, S.; Khadra, A.; Séguéla, P.; Diatchenko, L. Characterisation of common genetic variants in P2RX7 and their contribution to chronic pain conditions. In: *The Journal of Pain*, 2023.

Zorina-Lichtenwalter, K.; Bango, C.I.; van Oudenhove, L.; Čeko, M.; Lindquist, M.A.; Grotzinger, A.D.; Keller, M.C.; Friedman, N.P.; Wager, T.D. Genetic risk shared across 24 chronic pain conditions: Identification and characterization with genomic structural equation modeling. In: *Pain*, 2023.

Zorina-Lichtenwalter, K.; Maixner, W., Diatchenko, L. Detangling red hair from pain: phenotype-specific contributions from different genetic variants in melanocortin-1 receptor. In: *Pain*, 2019.

Zorina-Lichtenwalter, K.; Lichtenwalter, R.N., Zaykin, D.V., Parisien, M., Gravel, S., Bortsov, A., Diatchenko, L. A study in scarlet: *MC1R* as the main predictor of red hair and exemplar of the flip-flop effect. In: *Human Molecular Genetics*, 2019.

Zorina-Lichtenwalter, K.; Parisien, M., Diatchenko, L. Genetic studies of human neuropathic pain conditions: a review. In: *Pain*, 2018.

Meloto, C.B., Lichtenwalter, R.N.; Wen, X., Tugarinov, N., **Zorina-Lichtenwalter, K.**, Chabot-Doré, A.J., Piltonen; M.H., Cattaneo, S., Verma, V., Klares, R., Khoury, S., Parisien, M., Diatchenko, L. Genetic predictors of human chronic pain conditions. In: *Pain*, 2017.

Manahasenan, K.V., Bastian, M., Gao, M., Frost, E., Ding, D., **Zorina-Lichtenwalter, K.**, Jacobs, J., Suckow, M., Schroeder, V., Wolter, W., Chang, M., Mobashery, S. Exploitation of conformational dynamics in imparting selective inhibition for related matrix metalloproteinases. In: *ACS Medicinal Chemistry Letters*, 2017.

Zorina-Lichtenwalter, K., Meloto, C.B., Khoury, S., Diatchenko, L. Genetic predictors of human chronic pain conditions. In: *Neuroscience*, 2016.

Spink, E., Ding, D., Peng, Z., Boudreau, M.A., Leemans, E., Lastochkin, E., Song, W., **Lichtenwalter, K.**, O'Daniel, P.I., Testero, S.A., Hualiang, P., Schroeder, V.A., Wolter, W.R., Antunes, N.T., Suckow, M.A., Vakulenko, S., Chang, M., and Mobashery, S. Structure-activity relationship for the oxadiazole class of antibiotics. In: *Journal of Medicinal Chemistry*, 2015.

O'Daniel, P.I., Peng, Z., Pi, H., Testero, S.A., Ding, D., Spink, E., Leemans, E., Boudreau, M.A., Yamaguchi, T., Schroeder, V.A., Wolter, W.R., Llarrull, L.I., Song, W., Lastochkin, E., Kumarasiri, M., Antunes, N.T., Espahbodi, M., **Lichtenwalter, K.**, Suckow, M.A., Vakulenko, S., Mobashery, S., and Chang, M. Discovery of a new class of non-β-lactam inhibitors of penicillin-binding proteins with Gram-positive antibacterial activity. In: *Journal of the American Chemical Society*, 2014.

Ding, D., **Lichtenwalter, K.**, Pi, H., Mobashery, S., and Chang, M. Characterization of a selective inhibitor for matrix metalloproteinase-8 (MMP-8). In: *Medicinal Chemistry Communications*, 2014.

Gooyit, M., Song, W., Mahasenan, K.V., **Lichtenwalter, K.**, Suckow, M.A., Schroeder, V.A., Wolter, W.R. Mobashery, S., and Chang, M. *O*-Phenyl carbamate and phenyl urea thiiranes as selective matrix metalloproteinase-2 inhibitors that cross the blood-brain barrier. In: *Journal of Medicinal Chemistry*, 2013.

Lichtenwalter, R.N., **Lichtenwalter, K.**, and Chawla, N.V. A Machine-learning approach to autonomous music composition. In: *Journal of Intelligent Systems*, 2010.

Conference Publications

Lichtenwalter, R.N., **Zorina-Lichtenwalter, K.**, Diatchenko, L. Genotypic data in relational databases: efficient storage and rapid retrieval. In: *Proceedings of the Advances in Databases and Information Systems*, 2017.

Lichtenwalter, R.N. and **Lichtenwalter, K.** and Chawla, N.V. Applying learning algorithms to music generation. In: *Proceedings of the Indian International Conference on Artificial Intelligence*, December 2009.

Invited Talks

Lichtenwalter, K., Lichtenwalter, R.N., Parisien, M., Bortsov, A., Slade, G., Dubner, R., Fillingim, R., Greenspan, J., Ohrbach, R., Knott, C., Maixner, W., Diatchenko, L. Differential effects of the *MC1R* "red hair" SNPs on pain sensitivity and depression. Presented at the McGill's Faculty of Dentistry Research Day in Montreal, Canada. April 2017.

Lichtenwalter, K., Lichtenwalter, R.N., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. Melanocortin-1 receptor and its role in pain sensitivity. Presented at the Hot Topics session of the Canadian Pain Society scientific meeting in Vancouver, Canada. May 2016.

Lichtenwalter, K., Lichtenwalter, R.N., Ase, A.R., Niu, M., Komarova, S., Seguela, P., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. Genetic predisposition to chronic pain and inflammation? Exploring neuroimmune interactions through gain- and loss-of-function polymorphisms in *P2RX7*. Presented at the Philip R. Bromage Anesthesia Research Day in Montreal, Canada. May 2015.

Conference Talks

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Keller, M.C.; Wager, T.D.; Friedman, N.P. Differential genetic associations between chronic pain and phenotypes of substance use and abuse. Presented at the annual Institute for Behavioral Genetics mini-conference in Boulder, USA. May 2023.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Keller, M.C.; Van Oudenhove, L.; Wager, T.D.; Friedman, N.P. Genomic structural equation modeling links chronic pain, psychopathology, and neuroticism. Presented at the annual Institute for Behavioral Genetics mini-conference in Boulder, USA. May 2022.

Poster Presentations

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Keller, M.C.; Van Oudenhove, L.; Wager, T.D.; Friedman, N.P. Modeling shared genetic variance among pain conditions, psychopathologies, and neuroticism. Presented at the International Association for the Study of Pain meeting in Toronto, Canada. September 2022.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Lindquist, M.; Keller, M.C.; Van Oudenhove, L.; Wager, T.D.; Friedman, N.P. Genomic structural equation modeling links chronic pain, psychopathology, and neuroticism. Presented at the annual Behavior Genetics Associations meeting in Los Angeles, USA. June 2022.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Lindquist, M.; Keller, M.C.; Van Oudenhove, L.; Wager, T.D.; Friedman, N.P. Modeling the structure of shared genetic variance for pain conditions and psychopathology. Presented at the annual Canadian Pain Society scientific meeting in Montreal, Canada. May 2022.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Friedman, N.P.; Keller, M.C.; Van Oudenhove, L.; Lindquist, M.; Wager, T.D. Shared genetic susceptibility across multiple types of chronic pain implicates brain and neuroendocrine systems. Presented at the annual Society for Neuroscience meeting, virtual. November 2021.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Friedman, N.P.; Keller, M.C.; Van Oudenhove, L.; Paul, S.; Wager, T.D. Shared genetic and phenotypic risk factors in pain and psychological conditions. Presented at the annual Behavior Genetics Associations meeting, virtual. June 2021.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Friedman, N.P.; Keller, M.C.; Van Oudenhove, L.; Paul, S.; Wager, T.D. Shared genetic risk factors in pain conditions and psychopathologies. Presented at the annual Canadian Pain Society scientific meeting, virtual. April 2021.

Zorina-Lichtenwalter, K., Bango, C.; Čeko, M.; Friedman, N.P.; Keller, M.C.; Van Oudenhove, L.; Paul, S.; Wager, T.D. Shared genetic risk factors in pain conditions. Presented at the annual National Institute on Drug Abuse Genetics and Epigenetics Cross-Cutting Research Team meeting, virtual. March 2021.

Zorina-Lichtenwalter, K., Čeko, M.; Friedman, N.P.; Keller, M.C.; Van Oudenhove, L.; Wager, T.D. Factor analysis reveals a common genetic risk factor for many chronic pain conditions. Presented at the International Association for the Study of Pain Data Blitz meeting, virtual. January 2021.

Zorina-Lichtenwalter, K., Čeko, M.; Paul, S.; Friedman, N.P.; Keller, M.C.; Wager, T. Identification and characterization of common genetic risk factors for chronic pain and psychopathology. Presented at the annual Behavior Genetics Association meeting, virtual. June 2020.

Zorina-Lichtenwalter, K., Lichtenwalter, R.N.; Bortsov, A.; Slade, G.D.; Dubner, R.; Fillingim, R.B.; Greenspan, J.D.; Ohrbach R.; Knott, C.; Weir, B.S.; Maixner, W.; Diatchenko, L.B. Dissociating the genetic underpinnings of red hair and pain sensitivity. Presented at the annual Canadian Pain Society scientific meeting in Montreal, Canada. May 2018.

Zorina-Lichtenwalter, K., Lichtenwalter, R.N.; Bortsov, A.; Slade, G.D.; Dubner, R.; Fillingim, R.B.; Greenspan, J.D.; Ohrbach R.; Knott, C.; Weir, B.S.; Maixner, W.; Diatchenko, L.B. Red hair and pain sensitivity mediated by different MC1R variants. Presented at the annual McGill Pain Day in Montreal, Canada. January 2018.

Zorina-Lichtenwalter, K., Lichtenwalter, R.N.; Bortsov, A.; Slade, G.D.; Dubner, R.; Greenspan, J.D.; Ohrbach R.; Knott, C.; Weir, B.S.; Maixner, W.; Fillingim, R.B. ; Diatchenko, L.B. *MC1R* polymorphisms: of mice and (wo)men, red hair, and pain. Presented at the biennial European Federation of IASP Chapters scientific meeting in Copenhagen, Denmark. September 2017.

Zorina-Lichtenwalter, K., Parisien, M., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach R., Knott, C., Weir, B.S., Maixner, W., Chung, M.-K., Diatchenko, L.B. *TRPV1* polymorphisms in pain sensitivity and chronic pain. Presented at the annual Canadian Pain Society scientific meeting in Halifax, Canada. May 2017.

Lichtenwalter, K., Lichtenwalter, R.N., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. The effects of *MC1R* polymorphisms on pain sensitivity and psychological distress. Presented at the annual Canadian Pain Society scientific meeting in Vancouver, Canada. May 2016.

Lichtenwalter, K., Lichtenwalter, R.N., Ase, A.R., Niu, M., Komarova, S., Seguela, P., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. *P2RX7* genetics at the crossroads of neuroimmune interactions. Presented at the biennial European Federation of IASP Chapters scientific meeting in Vienna, Austria. September 2015.

Lichtenwalter, K., Lichtenwalter, R.N., Ase, A.R., Niu, M., Komarova, S., Seguela, P., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. The fine line between gain and loss: a genetic characterization of *P2RX7*. Presented at the annual Canadian Pain Society scientific meeting in Charlottetown, Canada. May 2015.

Lichtenwalter, K., Lichtenwalter, R.N., Ase, A.R., Niu, M., Komarova, S., Seguela, P., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B.The foul in fair and the fair in foul: gaining and losing pain with SNPs in *P2RX7*. Presented at the McGill Pain Day in Montreal, Canada. January 2015.

Lichtenwalter, K., Lichtenwalter, R.N., Ase, A.R., Niu, M., Komarova, S., Seguela, P., Slade, G.D., Dubner, R., Fillingim, R.B., Greenspan, J.D., Ohrbach, R., Knott, C., Maixner, W., and Diatchenko, L.B. The role of *P2RX7* genetic variants in pain processing examined through an annotated catalogue of non-synonymous SNPs. Presented at the biennial International Association for the Study of Pain Conference in Buenos Aires, Argentina. October 2014.

Manahasenan, K., Ding, D., Pi, H., **Lichtenwalter, K.**, Chang, M.; and Mobashery S. In search of an MMP-14 inhibitor. Annual Chemistry, Biology and Biochemistry Interface Program (CBBI) Symposium, Notre Dame, IN, USA. May 2013.

O'Daniel, P.I., Ikejiri, M., Testero, S., Peng, Z., Antunes, N., Kumarasiri, M., Boudreau, M., Spink, E., Leemans, E., Llarrull, L. I., Ding, D., Xiao, Q., Song, W., Pi, H., Espahbodi, M., **Lichtenwalter, K.**, Schroeder, V. A., Wolter, W. R., Suckow, M. A., Vakulenko, S. B., Mobashery, S., Chang, M. Discovery of the oxadiazole class of antibacterial agents. Presented at the Gordon Research Conference, New Antibacterial Discovery and Development, Lucca, Italy. April 2012.

Lichtenwalter, K. *Lieder eines fahrenden Gesellen*: an aesthetic dichotomy. Paper presented at the American Musicological Society Midwest Chapter Conference in Chicago, IL, USA. October 2009.

Lichtenwalter, K. Elgar's unintentional modernism: the aesthetics of captivity in the Cello Concerto. Paper presented at the American Musicological Society Capital Chapter Conference in Washington DC, USA. April 2009.

Teaching Experience

Ivy Tech Community College, South Bend, Indiana, USA

Adjunct Professor of French **August 2012 to December 2012**

Catholic University of America, Washington, D.C., USA

Lecturer of French **August 2007 to December 2008**

Montgomery College, Rockville, Maryland, USA

Adjunct Professor of French **August 2006 to December 2008**

Service and Awards

- Recipient of the Mitacs Globalink Research Award for a project carried out in Chengdu, China with Professor Li Tao at Sichuan University (October 2018-March 2019)
- Recipient of the McGill Graduate School's GREAT conference travel award (2016)
- Summers of 2011 and 2012: Notre Dame Bike-to-Work Competition: author and co-organizer
- Green Ambassador (part of the pilot program, launched in March 2011 as part of the University's Sustainability Strategic Plan)
- Michiana Bike-to-Work Week (2011 and 2012): Science team captain
- Tutor for Red Cross Community Language Bank (September-December 2010)
- College of Science Sustainability Week 2010: author and organizer
- Michiana Bike-to-Work Week (2010): College of Science team captain
- Relay for Life at Notre Dame (2010): College of Science team co-captain
- Pi Delta Phi French Honor Society, 2004