

Todd Rex Miller, Ph.D.

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Education:

- Ph.D. in Marine Estuarine Environmental Sciences, Marine Molecular Biology and Biotechnology, University of Maryland, College Park, MD. 2004.
- B.S. in Biological Sciences, St. Norbert College, DePere, WI. 1998.

Employment History:

- Associate Professor, Environmental Health Sciences, Joseph J. Zilber School of Public Health, University of Wisconsin Milwaukee. January 2016 - Present.
- Assistant Professor, Environmental Health Sciences, Joseph J. Zilber School of Public Health, University of Wisconsin Milwaukee. January 2011 - 2016.
- Research Associate, laboratory of Katherine McMahon, Ph.D., Department of Bacteriology and Department of Civil and Environmental Engineering, Madison, WI. October 2009 – 2010.
- Research Associate, laboratory of Katherine McMahon, Ph.D., Center for Limnology, Madison, WI. October 2007 – 2009.
- Post-doctoral scholar, Laboratory of Rolf Halden, Ph.D., P.E., Environmental Health Engineering, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD. November 2004 – October 2007.
- Graduate Research Assistant, Laboratory of Robert Belas, Ph.D., University of Maryland Biotechnology Institute, Center of Marine Biotechnology, Baltimore, MD. January 1999 – November 2004.

Service to Profession

Editorial Activities

- Editor for the PlosOne Journal since 2016
- Editor for Metagenomics 2019 - 2021

Conferences

- Vice- Chair Gordon Research Conference on Mycotoxins and Phycotoxins 2019
- Chair Gordon Research Conference on Mycotoxins and Phycotoxins 2023

Awards and Honors:

2014 UWM Foundation Research Award

2013 Nominated UWM Undergraduate Research Mentor of the year award

Teaching:

- PH750 Algal Toxins in Drinking Water and Recreational Environments
- PH750 Seminar in Environmental Health Sciences
- PH750 Biology and History of Ebola Outbreaks
- PH740/PH375 Environmental Monitoring
- PH775 Mechanisms of Infectious Diseases
- PH741 Environmental Health Microbiology

- PH142 Exploring Global Environmental Health
- PH743 Environmental Risk Assessment

Publications:

2023

Rohwer R., R.J. Hale, T.R. Miller, K.D. McMahon (2023) Species invasions shift microbial phenology in a two-decade freshwater time series. *Proceedings of the National Academy of Sciences. In press.*

Corman J., Roegner A., Ogari Z., Miller T.R., Aura C.M (2023) Local-scale impacts of water hyacinth on water quality in a hypereutrophic lake. *Frontiers in Water. In press*

Roegner, Amber, Jessica Corman, Lewis Sitoki, Zachary Kwena, Zachary Ogari, Jared Miruka, Ame Xiong, Chelsea Weirich, Christopher Aura, and Todd R. Miller (2022) Impacts of algal blooms and microcystins in fish on small-scale fishers in Winam Gulf, Lake Victoria: Implications for health & livelihood. *Ecology and Society. In press.*

2022

Miller, T. R., Tarpey, W., Nuese J., Smith M. (2022). Real time monitoring of cyanobacterial harmful algal blooms with the Panther Buoy. *Environmental Science and Technology Water* 6: 1099–1110.

<https://pubs.acs.org/doi/abs/10.1021/acsestwater.2c00072>

2021

Zastepa, A., Miller, T. R., Watson, L. C., Kling, H., & Watson, S. B. (2021). Toxins and other bioactive metabolites in deep chlorophyll layers containing the cyanobacteria *Planktothrix cf. isothrix* in two Georgian Bay Embayments, Lake Huron. *Toxins*, 13(7). doi:10.3390/toxins13070445. <https://www.mdpi.com/2072-6651/13/7/445>

Wang, C, Yang, Y, Yang, B., Lin, H., Miller, T. R., Newton, R. J., & Guo, L. 2021. Causal relationship between alkaline phosphatase activities and phosphorus dynamics in a eutrophic coastal lagoon in Lake Michigan. *Science of The Total Environment*, 787, 147681. <https://doi.org/10.1016/j.scitotenv.2021.147681>

2020

Sterner RW, Reint KL, Lafrancois BM, Brovold S, Miller TR. 2020. A first assessment of cyanobacterial blooms in oligotrophic Lake Superior. *Limnology and Oceanography*. <https://doi.org/10.1002/lno.11569>

Miller TR, Xiong A, Deeds JR, Stutts W, Samdal IA, Løvberg KE, and Miles CO. 2020. Microcystin toxins at potentially hazardous levels in algal dietary supplements revealed by a combination of bioassay, immunoassay and mass spectrometric methods. *Journal of Agricultural and Food Chemistry*. <https://doi.org/10.1021/acs.jafc.0c02024>

Roegner A, Sitoki L, Weirich C, Corman J, Owage D, Umami M, Odada E, Miruka J, Ogari Z, Smith W, Rejmankova E, Miller TR. 2020. Harmful algal blooms threaten the health of peri-urban fisher communities: a case study in Kisumu Bay, Lake Victoria, Kenya. *Exposure and Health*. <https://doi.org/10.1007/s12403-019-00342-8>

2019

Miller, T.R., S.L. Bartlett, C.A. Weirich, and J. Hernandez. 2019. Automated sub-daily sampling of

cyanobacterial toxins on a buoy reveals new temporal patterns in toxin dynamics. *Environmental Science and Technology*. 53(10):5661-5670.

Weirich, C. A., D.M. Robertson, T.R. Miller. 2019. Physical, biogeochemical, and meteorological factors responsible for interannual changes in cyanobacterial community composition and biovolume over two decades in a eutrophic lake. *Hydrobiologia*. 828:165–182.

Lenz, Kade A., Todd R. Miller, and Hongbo Ma. 2019. Anabaenopeptins and cyanopeptolins induce systemic toxicity effects in a model organism the nematode *Caenorhabditis elegans*. *Chemosphere*. 214:60-69.

2018

Bartlett, S.L., S.A. Brunner, J. Val Klump, E.M. Houghton, T.R. Miller. 2018. Spatial analysis of toxic or otherwise bioactive cyanobacterial peptides in Green Bay, Lake Michigan. *Journal of Great Lakes Research*. 44:924-933

Lucas J Beversdorf, Kayla Rude, Chelsea Weirich, Sarah L Bartlett, Mary Seaman, Christine Kozik, Peter Biese, Timothy Gosz, Michael Suha, Christopher Stempa, Christopher Shaw, Curtis J Hedman, Joseph Piatt, and Todd R Miller. 2018. Analysis of cyanobacterial metabolites in surface and raw drinking waters reveals more than microcystin. *Water Research*. 140:280-290

Natalie M. Flores, Todd R. Miller, Jason D. Stockwell. 2018. A global analysis of the relationship between concentrations of microcystins in water and fish. *Frontiers in Marine Science*. 10.3389/fmars.2018.00030

2017

Lisa S. Mydy, Zahra Mashhadi, T. William Knight, Tyler Fenske, Trevor Hagemann, Robert W. Hoppe, Lanlan Han, Todd R. Miller, Alan W. Schwabacher and Nicholas R. Silvaggi . (2017) Structural and preliminary functional characterization of Swit_4259, an acetoacetate decarboxylase-like enzyme from *Sphingomonas wittichii* RW1. *Acta Crystallographica F. Acta Cryst.* (2017). F73, 672-681

Alan D. Steinman, Bradley J. Cardinale, Wayne R. Munns Jr, Mary E. Ogdahl, J. David Alland, Ted Angadie, Sarah Bartlett, Kate Brauman, Muruleedhar Byappanahalli, Matt Dossi, Diane Dupont, Annie Johns, Donna Kashian, Frank Lupi, Peter McIntyre, Todd Miller, Michael Moore, Rebecca Logsdon Muenich, Rajendra Poudel, James Price, Bill Provencher, Anne Rea, Jennifer Read, Steven Renzetti, Brent Sohngen, Erika Washburn (2017) Ecosystem services in the Great Lakes. *J. Great Lakes Res.* 43(3)161-168.

Todd R. Miller, Lucas Beversdorf, Chelsea A. Weirich, and Sarah Bartlett. (2017) Cyanobacterial Toxins of the Laurentian Great Lakes, their Toxicological Effects, and Numerical Limits in Drinking Water. *Marine Drugs*. 15(6) pii: E160.

Beversdorf, L. J.; Weirich, C. A.; Bartlett, S. L.; Miller, T. R. (2017) Variable cyanobacterial toxin and metabolite profiles across six eutrophic lakes of differing physiochemical characteristics. *Toxins* 9(2).

Xiao, X., He, J., Huang, H., Miller, T.R., Christakos, G., Reichwaldt, E.S. et al. (2017) A novel single-parameter approach to forecast algal blooms. *Water Res* 108: 222-231.

2015

Beversdorf, L.J., T.R. Miller, K. McMahon. (2015) Long-term monitoring reveals carbon-nitrogen

metabolism key to microcystin production in eutrophic lakes. *Frontiers in Aquatic Microbiology*.

Beversdorf, L.J., S. Chaston, T.R. Miller, K. McMahon. (2015) Microcystin *mcyA* and *mcyE* gene abundances are not appropriate indicators of microcystin concentrations in lakes. *PLoS ONE*. 10.1371/journal.pone.0125353.

2013

Weirich, C.A. and Miller, T.R. (2013) Freshwater algal toxins and children's health: a review. *Current Problems in Pediatrics and Adolescent Health Care*. 44:2-24.

Miller, T.R., Lucas Beversdorf, and Katherine McMahon. (2013) Spatiotemporal molecular analysis of toxic cyanobacteria blooms reveals *Microcystis*-*Aphanizomenon* interactions. *PLoS ONE* 8(9): e74933. doi:10.1371/journal.pone.0074933.

Beversdorf, L.J., Miller, T. R. and K. D. McMahon. (2013) The role of nitrogen fixation in cyanobacterial bloom toxicity in a temperate, eutrophic lake. *PLoS ONE*. 8: e56103.

2011

Kara, E. L., P. Hanson, D. Hamilton, M. Hipsey, K. McMahon, J. Read, L. Winslow, J. Dedrick, K. Rose, C. Carey, S. Bertilsson, D. d. M. Marques, L. Beversdorf, T. Miller, C. Wu, Y.-F. Hsieh, E. Gaiser, and T. Kratz. (2011) Time-scale dependence in numerical simulations: Assessment of physical, chemical, and biological predictions in a stratified lake at temporal from scales of hours to months. *Environmental Modelling and Software*. 35:104–121.

Miller, T.R., and K.D. McMahon. (2011) Genetic diversity of cyanobacteria in four eutrophic lakes. *FEMS Microbiol. Ecol.* 78:336–348

2010

Miller, T.R., A.L. Delcher, S.L. Salzberg, E. Saunders, J.C. Detter, and R.U. Halden. (2010) The genome sequence of the dioxin mineralizing bacterium *Sphingomonas wittichii* RW1. *J. Bacteriol.* 192:6101-6102

Miller, T.R., and R.U. Halden. (2010) Identification of wastewater bacteria involved in the degradation of triclocarban. *J. Hazard. Mater.* 183:766-772.

2008

Miller, T.R., S. Chillrud, J. Heidler and R.U. Halden. (2008) Fate of triclosan and evidence for reductive dechlorination of triclocarban in estuarine sediments. *Environ. Sci. and Technol.* 42:4570–4576.

2007

Miller, T.R., M. P. Franklin and R. U. Halden. (2007) Bacterial community analysis of shallow groundwater undergoing sequential anaerobic and aerobic chloroethene biotransformation. *FEMS Microbiol. Ecol.* 60:299-311.

2006

Reid, I. N., W. B. Sparks, S. Lubow, M. McGrath, M. Livio, J. Valenti, K. R. Sowers, H. D. Shukla, S.

MacAuley, T. Miller, R. Suvanasuthi, R. Belas, A. Colman, F. T. Robb, P. DasSarma, J. A. Müller, J. A. Coker, R. Cavicchioli, F. Chen and S. DasSarma. (2006) Terrestrial models for extraterrestrial life: methanogens and halophiles at Martian temperatures. *Intl. J. Astrobiol.* 5:89-97.

Miller, T. R. and R. Belas. (2006) Motility is involved in *Silicibacter* sp. TM1040 interaction with dinoflagellates. *Environ. Microbiol.* 8:1648-1659.

Dong, W., G. Xie, T. R. Miller, M. P. Franklin, T. P. Oxenberg, E. J. Bouwer, W. P. Ball, and R. U. Halden. (2006) Sorption and bioreduction of hexavalent uranium at a military facility by the Chesapeake Bay. *Environ. Pollut.* 132:132-142.

2004

Moran, M. A., A. Buchan, J. M. González, J. F. Heidelberg, W. B. Whitman, R. P. Kiene, J. R. Henriksen, G. M. King, R. Belas, C. Fuqua, L. Brinkac, M. Lewis, S. Johri, B. Weaver, G. Pai, J. A. Eisen, E. Rahe, W. M. Sheldon, W. Ye, T. R. Miller, J. Carlton, D. A. Rasko, I. T. Paulsen, Q. Ren, S. C. Daugherty, R. T. Deboy, R. J. Dodson, A. S. Durkin, R. Madupu, W. C. Nelson, S. A. Sullivan, M. J. Rosovitz, D. H. Haft, J. Selengut, and N. Ward. (2004) Genome sequence of *Silicibacter pomeroyi* reveals adaptations to the marine environment. *Nature.* 432: 910 - 913

Miller, T. R., and R. Belas. (2004) Chemotaxis of *Silicibacter* sp. TM1040 toward dinoflagellate products. *Appl. Environ. Microbiol.* 70:4692-4701

Miller, T. R., and R. Belas. (2004) Dimethylsulfoniopropionate (DMSP) metabolism by *Pfiesteria* - associated *Roseobacter*. *Appl. Environ. Microbiol.* 70:3383-3391

2003

Miller, T. R., and R. Belas. (2003) *Pfiesteria piscicida*, *P. shumwayae*, and other *Pfiesteria*-like dinoflagellates. *Res. Microbiol.* 154:85-90

Quesenberry, M. S., K. Saito, D. Krupatkina, J. Robledo, T. Drgon, W. Pecher, N. O'Leary, M. Alavi, T. Miller, R. Schneider, R. Belas, J. Deeds, A. Place, Y. Zohar, and G. Vasta. (2003) Bioassay for ichthyocidal activity of *Pfiesteria piscicida*: characterization of a culture flask assay format. *J. Appl. Phycol.* 14:241-254.

2001

Alavi, M., T. Miller, K. Erlandson, R. Schneider, and R. Belas. (2001) Bacterial community associated with *Pfiesteria*-like dinoflagellate cultures. *Environ. Microbiol.* 3:380-396