# Dr. Charles Wong

Department Head
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# Education

Ph.D., civil engineering, University of Minnesota, Minneapolis MN, 1998.

S.M., civil engineering, Massachusetts Institute of Technology, Cambridge MA, 1992.

# Professional Experience

Professor and former Canada Research Chair (Tier II) in Ecotoxicology, University of Winnipeg. 2008-2019

Assistant Professor of Chemistry, University of Alberta. 2002-2008

Adjunct faculty member, Costa Rica Institute of Technology. 2016-2023

Adjunct faculty member, University of Winnipeg. 2019-2022

Adjunct faculty member University of Manitoba. 2008-2022

Adjunct faculty member University of Alberta. 2008-2012

Scientist, Children's Hospital Research Institute of Manitoba. 2012-2018

Chair Professor, Jinan University. 2016-2019

Visiting Scientist, Guangzhou Institute of Geochemistry. 2012

Postdoctoral Associate, University of Toronto and Environment Canada. 1999-2002

Postdoctoral Associate, U.S. Environmental Protection Agency. 1997-1999

# Honors and Awards

Excellence in Review Award, Environmental Science & Technology Letters, 2018.

Jinan University Chair Professor, 2016-2019.

Canada Research Chair (Tier II), University of Winnipeg, 2008-2018.

Society of Environmental Toxicology and Chemistry/Weston Environmental Solutions Award, sponsored by the Monsanto Company, 2007.

Society of Environmental Toxicology and Chemistry/American Chemistry Council Early Career Award for Applied Ecological Research, 2003.

U.S. Environmental Protection Agency Bronze Medal for Commendable Service, 2000.

American Chemical Society, Division of Environmental Chemistry, Graduate Student Award, 1992.

American Chemical Society, Division of Environmental Chemistry, and Lewis Publishers, Graduate Student Paper Award [Wong CS, Chin YP, Gschwend PM (1992). Sorption of radon-222 to natural sediments. Geochim Cosmochim Acta 56, 3923-3932, 1992.

# Selected Presentations and Conference Proceedings

Southern California Coastal Water Research Project Authority, Costa Mesa CA, August 2018.

The Ohio State University, Department of Civil, Environmental and Geodetic Engineering, Columbus OH, August 2018.

ETH Zurich, Environmental Chemistry Group, Zurich, Switzerland, August 2018.

Xiamen University, College of the Environment & Ecology, Xiamen, China, June 2018.

Southern California Coastal Water Research Project Authority, Costa Mesa CA, August 2017.

Chinese University of Geosciences, Beijing, China, May 2017.

Hong Kong Baptist University, Department of Chemistry, Hong Kong SAR, February 2017.

Trent University, Trent Water Quality Centre, Peterborough ON, August 2016.

Instituto Tecnologico de Costa Rica, Department of Chemistry, Cartago, Costa Rica, June 2016.

University of California Riverside, Department of Environmental Sciences, Riverside CA, February 2016.

# Journal Articles

Lao, W., S. Sauers, C.S. Wong. 2025. Characterization and potential influence of laboratory airborne particle fallout on microplastics analysis. *Journal of Hazardous Materials* 499:140309.

Singh, S., A.B. Gray, C. Murphy-Hagan, H. Hapich, W. Cowger, J. Perna, T. Le, H. Nogi, B. Badwal, K. McLaughlin, F. Kessouri, C. Moore, G. Lattin, L.M. Thornton Hampton, C.S. Wong, M. Sutula. 2025. Microplastic pollution in the water column and benthic sediment of the San Pedro Bay, California, USA. *Environmental Research* 269:120866.

Lohmann, R., B. Vrana, D. Muir, F. Smedes, J. Sobotka, E.Y. Zeng, L.J. Bao, I.J. Allan, P. Astrahan, T. Bidleman, D. Crowley, E. Dykyi, N. Estoppey, G. Fillmann, L. Jantunen, S. Kaserzon, K.A. Maruya, B. McHugh, B. Newman, R.M. Prats, M. Tsapakis, M. Tysklind, B.L. van Drooge, C.S. Wong. 2024. AQUA-GAPS/MONET-Derived Concentrations and Trends of PAHs and Polycyclic Musks across Global Waters. *Environmental Science & Technology* 58:13456-13466.

Wang, P., J. Li, M.Y. Xie, C.C. Wu, C.S. Wong, E.Y. Zeng. 2024. Utility of a modified o-DGT passive sampler for measurement of bisphenol analogues in freshwater and coastal waters. *Science of the Total Environment* 931:172978.

Wong, C.S., S. Coffin, C.M. Rochman, S.B. Weisberg. 2024. Informing methods for detecting and quantifying microplastics through the lens of a global intercalibration exercise: An editorial overview of the special issue and beyond. *Chemosphere* 356:141662.

Wong, C.S., S.B. Weisberg. 2024. Development of an accreditation process for analytical methods to measure microplastics in drinking water for regulatory monitoring. *Chemosphere* 353:141568.

Lao, W., S. Sauers, M. Salmon, C.S. Wong. 2024. Development and validation of an acid/alkaline digestion method for efficient microplastic extraction from wastewater treatment plant effluents: Sulfuric acid concentration and contact time do matter. *Science of the Total Environment* 917: 170528.

Starks, M., C.M. Schaefer, K.M. Jeffries, D. Deslauriers, K.H. Luong, C.S. Wong, M.L. Hanson, C.W. Knapp. 2023. Presence of antibiotic resistance genes in the receiving environment of Iqaluit’s wastewater treatment plant in water, sediment, and clams sampled from Frobisher Bay,

Nunavut: a preliminary study in the Canadian Arctic. *Arctic Science* 9:919-927.

Thornton Hampton, L.M., H. De Frond, K. Gesulga, S. Kotar, W. Lao, C. Matuch, S.B. Weisberg, C.S. Wong, S. Brander, S. Christansen, C.R. Cook, F. Du, S. Ghosal, A.B. Gray, J. Hankett, P.A. Helm, K.T. Ho, T. Kefela, G. Lattin, A. Lusher, L. Mai, R.E. McNeish, O. Mina, E.C. Minor, S. Primpke, K. Rickabaugh, V.C. Renick, S. Singh, B.V. Bavel, F. Vollnhals, C.M. Rochman. 2023. The influence of complex matrices on method performance in extracting and monitoring for microplastics. *Chemosphere* 334:138875.

Lohmann, R., B. Vrana, D. Muir, F. Smedes, J. Sobotka, E.Y. Zeng, L. Bao, I.J. Allan, P. Astrahan, R.O. Barra, T. Bidleman, E. Dykyi, N. Estoppey, G. Fillmann, N. Greenwood, P.A. Helm, L. Jantunen, S. Kaserzon, J.V. Macias, K.A. Maruya, F. Molina, B. Newman, R.M. Prats, M. Tsapakis, M. Tysklind, B.L. van Drooge, C.J. Veal, C.S. Wong. 2023. Passive-Sampler-Derived PCB and OCP Concentrations in the Waters of the World—First Results from the AQUA-GAPS/MONET Network. *Environmental Science and Technology* 57:9342-9352.

Munno, K., A.L. Lusher, E.C. Minor, A. Gray, K. Ho, J. Hankett, C.T. Lee, S. Primpke, R.E. McNeish, C.S. Wong, C. Rochman. 2023. Patterns of microparticles in blank samples: A study to inform best practices for microplastic analysis. *Chemosphere* 333:138883.

Lao, W., C.S. Wong. 2023. How to establish detection limits for environmental microplastics analysis. *Chemosphere* 327:138456.

Langknecht, T., W. Lao, C.S. Wong, S. Kotar, D.E. Khatib, S. Robinson, R.M. Burgess, K.T. Ho. 2023. Comparison of two procedures for microplastics analysis in sediments based on an interlaboratory exercise. *Chemosphere* DOI:10.1016/j.chemosphere.2022.137479.

Kotar, S., R. McNeish, C. Murphy-Hagan, V. Renick, C.T. Lee, C. Steele, A. Lusher, C. Moore, E. Minor, J. Schroeder, P. Helm, K. Rickabaugh, H.D. Frond, K. Gesulga, W. Lao, K. Munno, L.M. Thornton Hampton, S.B. Weisberg, C.S. Wong, G. Amarpuri, R.C. Andrews, S.M. Barnett, S. Christiansen W Cowgeri, K. Crampond, F. Du, A.B. Gray, J. Hankett, K. Ho, J. Jaeger, C. Lilley, L. Mai, O. Mina, E. Lee, S. Primpke, S. Singh, J. Skovly, T. Slifko, S. Sukumaran, B. Bavel, J.V. Brocklin, F. Vollnhals, C. Wu, C.M. Rochman . 2022. Quantitative assessment of visual microscopy as a tool for microplastic research: Recommendations for improving methods and reporting. *Chemosphere* 308:1-9.

De Frond, H., L.M. Thornton Hampton, S. Kotar, K. Gesulga, C. Matuch, W. Lao, S.B. Weisberg, C.S. Wong, C.M. Rochman . 2022. Monitoring microplastics in drinking water: An interlaboratory study to inform effective methods for quantifying and characterizing microplastics. *Chemosphere* 298:134282.

Wang, P., J.K. Challis, Z.X. He, C.S. Wong, E.Y. Zeng. 2022. Effects of biofouling on the uptake of

perfluorinated alkyl acids by organic-diffusive gradients in thin films passive samplers. *Environmental Science: Processes & Impacts* 24:242.

Vanderpont, A.K., C. Lobson, Z. Lu, K. Luong, M. Arentsen, T. Vera, D. Moore, M.S. White, R.S. Prosser, C.S. Wong, M.L. Hanson. 2022. Fate of thiamethoxam from treated seeds in mesocosms and response of aquatic invertebrate communities. *Ecotoxicology* DOI:10.1007/s10646-021-02500-8.

Du, B., W. Lao, C.S. Wong, K. McLaughlin, K.C. Schiff. 2021. Scrutinizing surficial sediment along a 600-km-long urban coastal zone: Occurrence and risk assessment of fipronil and its three degradates. *Science of the Total Environment* DOI:10.1016/j.scitotenv.2021.151071.

Ledezma-Espinoza, A., J.K. Challis, F. Roa-Gutierrez, A. Sanchez-Kopper, E. Castellon, C.S. Wong. 2021. Photolysis of the nonsteroidal anti-inflammatory drug sulindac: elucidation of kinetic behaviour and photodegradation pathways in water. *Environmental Science Processes & Impacts* 23:1405-1417.

Wang, P., B. Du, J. Smith, W. Lao, C.S. Wong, E.Y. Zeng. 2021. Development and field evaluation of the organic-diffusive gradients in thin-films (o-DGT) passive water sampler for microcystins. *Chemosphere* 287:132079. DOI:10.3389/fmicb.2021.674214.

Chaves-Barquero, L.G., B.W. Humeniuk, K.H. Luong, N. Cicek, C.S. Wong, M.L. Hanson. 2021. Crushed recycled glass as a substrate for constructed wetland wastewater treatment: a case study of its potential to facilitate pharmaceutical removal. *Environmental Science and Pollution Research* DOI:10.1007/s11356-021-14483-4.

Harraka, G.T., J.T. Magnuson, B. Du, C.S. Wong, K. Maruya, D. Schlenk. 2020. Evaluating the estrogenicity of an effluent-dominated river in California, USA: Comparisons of in vitro and in vivo bioassays. *Science of the Total Environment* DOI:10.1016/j.scitotenv.2020.143965.

Wang, P.F., J.K. Challis, K.H. Luong, T.C. Vera, C.S. Wong. 2020. Calibration of organic-diffusive gradients in thin films (o-DGT) passive samplers for perfluorinated alkyl acids in water. *Chemosphere* DOI:10.1016/j.chemosphere.2020.128325.

Du, B., Z. Tian, K.T. Peter, E.P. Kolodziej, C.S. Wong. 2020. Developing Unique Nontarget High-Resolution Mass Spectrometry Signatures to Track Contaminant Sources in Urban Waters. *Environmental Science & Technology Letters* DOI:10.1021/acs.estlett.0c00749.

Brown, A.K., J. Ackerman, N. Cicek, C.S. Wong. 2020. In situ kinetics of human pharmaceutical conjugates and the impact of transformation, deconjugation, and sorption on persistence in wastewater batch bioreactors. *Environmental Pollution* DOI:10.1016/j.envpol.2020.114852.

Challis, J.K., A. Parajas, J.C. Anderson, E. Asiedu, J.W. Martin, C.S. Wong, M.S. Ross. 2020.

Photodegradation of bitumen-derived organics in oil sands process-affected water. *Environmental Science: Processes & Impacts* 22:1243-1255.

Anderson, J.C., P. Jabari, A. Parajas, E. Loeb, K.H. Luong, A. Vahedi, C.S. Wong. 2020. Evaluation of cold-weather wastewater nitrification technology for removal of polar chemicals of emerging concern from rural Manitoba wastewaters. *Chemosphere* DOI:10.1016/j.chemosphere.2020.126711.

Wu, L., R. Wang, C.L. Huang, C.C. Wu, C.S. Wong, L.J. Bao, E.Y. Zeng. 2020. Impact of passive sampler protection apparatus on sediment porewater profiles of hydrophobic organic compounds. *Chemosphere* DOI:10.1016/j.chemosphere.2020.126534.

Yu Z, Peng B, Liu L-Y, Wong CS, Zeng EY. Development and validation of an efficient method for analyzing microplastics in biota samples. Environ Toxicol Chem (DOI:10.1002/etc.4416)

Steinkey D, Lari E, Woodman SG, Steinkey R, Luong KH, Wong CS, Pyle GG (2019). The effects of diltiazem on growth, reproduction, energy reserves, and calcium-dependent physiology in Daphnia magna. Chemosphere 232, 424-429. (DOI:10.1016/j.chemosphere.2019.05.176)

Workman CE, Becker AB, Azad MB, Moraes TJ, Mandhane PJ, Turvey PJ, Subbarao P, Brook JR, Sears MR, Wong CS (2019). Associations between concentrations of perfluoroalkyl substances in human plasma and maternal, infant, and home characteristics in Winnipeg, Canada. Environ Pollut 249, 758-766. (DOI:10.1016/j.envpol.2019.03.054)

Li T-Y, Bao L-J, Wu C-C, Liu L-Y, Wong CS, Zeng EY (2019). Organophosphate flame retardants emitted from thermal treatment and open burning of e-waste. J Haz Mat367, 390-396. (DOI:10.1016/j.jhazmat.2018.12.041)

Challis JK, Stroski KM, Luong KH, Hanson ML, Wong CS (2018). Field evaluation and in situ stresstesting of the organic-diffusive gradients in thin-films passive sampler. Environ Sci Technol 52, 12573-12582. (DOI:10.1021/acs.est.8b03622)

Brown AK, Wong CS (2018). Distribution and fate of pharmaceuticals and their metabolite conjugates in a municipal wastewater treatment plant. Wat Res 144, 774-783. (DOI:10.1016/j.watres.2018.08.034)

Chaves-Barquero LG, Luong KH, Rudy MD, Frank RA, Hanson ML, Wong CS (2018). Attenuation of pharmaceuticals, nutrients and toxicity in a rural sewage lagoon system integrated with a subsurface filtration technology. Chemosphere 209, 767-775. (DOI:10.1016/j.chemosphere.2018.06.119)

Mai L, Bao L-J, Wong CS, Zeng EY (2018). Microplastics in the terrestrial environment. In Microplastic contamination in aquatic environments: An emerging matter of environmental

urgency (Zeng EY, ed.), Elsevier (ISBN 978-0-12-813747-5), 365-378.

Lobson C, Luong KH, Seburn D, White M, Hann M, Prosser R, Wong CS, Hanson ML (2018). Fate of thiamethoxam in mesocosms and response of the zooplankton community. Sci Total Environ 637-638, 1150-1157. (DOI:10.1016/j.scitotenv.2018.05.087)

Kang AJ, Brown AK, Wong CS, Huang Z, Yuan Q (2018). Variation in bacterial community structure of aerobic granular and suspended activated sludge in the presence of the antibiotic sulfamethoxazole. Bioresour Technol 261, 322-328. (DOI:10.1016/j.biortech.2018.04.054)

Wang F, Wong CS, Chen D, Lu X, Wang F, Zeng EY (2018). Interaction of toxic chemicals with microplastics: A critical review. Wat Res 139, 208-219. (DOI:10.1016/j.watres.2018.04.003)

Mai L, Bao L-J, Shi L, Wong CS, Zeng EY (2018). A review of methods for measuring microplastics in aquatic environments. Environ Sci Pollut Res 25, 11319-11332. (DOI:10.1007/s11356-018-1692-0)

Challis JK, Cuscito LD, Joudan S, Luong KH, Knapp CW, Hanson ML, Wong CS (2018). Inputs, source apportionment, and transboundary transport of pesticides and other polar organic contaminants along the lower Red River, Manitoba, Canada. Sci Total Environ 635, 803-816. (DOI:10.1016/j.scitotenv.2018.04.128)

Stroski KM, Challis JK, Wong CS (2018). The influence of pH on sampler uptake for an improved configuration of the organic-diffusive gradients in thin films passive sampler. Anal Chim Acta 1018, 45-53. (DOI:10.1016/j.aca.2018.02.074)

Jha A, Rhy MH, Ojo OO,Bews HJ, Carlson JC, Schwartz J, Basu S, Wong CS, Halayko AJ (2018). Prophylactic benefits of systemically delivered simvastatin treatment in a house dust mite challenged murine model of allergic asthma. Brit J Pharmacol 175, 1004-1016. (DOI:10.1111/bph.14140).

Challis JK, Hanson ML, Wong CS (2018). Pharmaceuticals and pesticides archived on polar passive sampling devices can be stable for up to six years. Environ Toxicol Chem 37, 762-767. (DOI:10.1002/etc.4012).

Kang AJ, Brown AK, Wong CS, Yuan Q (2018). Removal of antibiotic sulfamethoxazole by anoxic/anaerobic/ oxic granular and suspended activated sludge processes. Bioresour Technol 251, 151-157. (DOI:10.1016/j.biortech.2017.12.021).

Steinkey D, Lari E, Woodman SG, Luong KH, Wong CS, Pyle GG (2018). Effects of gemfibrozil on the growth, reproduction, and energy stores of Daphnia magna in the presence of varying food concentrations. Chemosphere 192, 75-80. (DOI:10.1016/j.chemosphere.2017.10.124).

Brown AK, Wong CS (2017). Measurement of thyroxine and its glucuronide in municipal wastewater and solids using weak anion exchange solid phase extraction and ultrahigh performance liquid chromatography-tandem mass spectrometry. J Chromatogr A 1525, 71-78. (DOI:10.1016/j.chroma.2017.10.010).

Wang J-X, Bao L-J, Luo P, Shi L, Wong CS, Zeng EY (2017). Intake, distribution, and metabolism of decabromodiphenyl ether and its main metabolites in chickens and implications for human dietary exposure. Environ Pollut 231, 795-801. (DOI:10.1016/j.envpol.2017.08.084).

Mi X-B, Bao L-J, Wu C-C, Wong CS, Zeng EY (2017). Tissue distribution, metabolism, and elimination of decabrominated diphenyl ether (BDE-209) in rats after multi-dose oral exposure. Chemosphere 186, 749-756. (DOI:10.1016/j.chemosphere.2017.08.049).

Lohmann R, Muir DCG, Zeng EY, Bao L-J, Allan IJ, Arinaitwe K, Booij K, Helm P, Kaserzon S, Mueller JF, Shibata Y, Smedes F, Tsapakis M, Wong CS, You J (2017). Aquatic global passive sampling (AQUA-GAPS) revisited: First steps towards a network of networks for organic contaminants in the aquatic environment. Environ Sci Technol 51, 1060-1067. (DOI:10.1021/acs.est.6b05159).

Cardinal P, Anderson JC, Carlson JC, Low JE, Challis JK, Wong CS, Hanson ML (2016). Late season pharmaceutical fate in wetland mesocosms with and without phosphorous addition. Environ Sci Pollut Res 23, 22678-22690. (DOI: 10.1007/s11356-016-7433-3).

Challis JK, Hanson ML, Wong CS (2016). Development and calibration of an organic-diffusive gradients in thin films aquatic passive sampler for a diverse suite of polar organic contaminants. Anal Chem 88, 10583-10591. (DOI:10.1021/acs.analchem.6b02749)

Brown AK, Wong CS (2016). Simultaneous quantification of propranolol and sulfamethoxazole and major human metabolite conjugates 4-hydroxy-propranolol and sulfamethoxazole-ÃÂ²-glucuronide in municipal wastewater using liquid chromatography-tandem mass spectrometry: A framework for multiple classes of drugs and conjugates. J Chromatogr A 1471, 34-44. (DOI:10.1016/j.chroma.2016.10.011)

Wu C-C, Yao Y, Bao L-J, Wu F, Wong CS, Tao S, Zeng EY (2016). Fugacity gradients of hydrophobic organics across the air-water interface measured with a novel passive sampler. Environ Pollut 218, 1108-1115. (DOI:10.1016/j.envpol.2016.08.064)

Chaves-Barquero LG, Luong KH, Mundy CJ, Knapp CW, Hanson ML, Wong CS (2016). The release of wastewater contaminants in the Arctic: A case study from Cambridge Bay, Nunavut, Canada. Environ Pollut 218, 542-550. (DOI:10.1016/j.envpol.2016.07.036)

Brown AK, Challis JK, Wong CS, Hanson ML (2015). Selective serotonin reuptake inhibitors and

ÃÂ²-blocker transformation products may not pose a significant risk of toxicity to aquatic organisms in wastewater effluent-dominated receiving waters. Integ Environ Assess Manage 11, 618-639. (DOI:10.1002/ieam.1637)

Anderson JC, Joudan S, Shoichet E, Cuscito LD, Alipio AEC, Donaldson CS, Khan S, Goltz DM, Knapp CW, Hanson ML, Wong CS (2015). Reducing nutrients, organic micropollutants, antibiotic resistance, and toxicity in rural wastewater effluent with subsurface filtration treatment technology. Ecol Eng 84, 375-385. (DOI:10.1016/j.ecoleng.2015.08.005)

Lu Z, Challis JK, Wong CS (2015). Quantum yields for direct photolysis of neonicotinoid insecticides in water: Implications for exposure to nontarget aquatic organisms. Environ Sci Technol Lett 2, 188-192. (DOI:10.1021/acs.estlett.5b00136). Featured in American Chemical Society Presspac press release, 8 July 2015.

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