

Dr. Charles Wong

Department Head

Chemistry Department

Southern California Coastal Water Research Project

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 Tecnológico 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. Christensen, 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. Amarपुरi, 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)

Steinke 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 Mat* 367, 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 stress testing 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).

Steinke 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, Tsapakakis 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- β -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

Å²-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.

Brown AK, Wong CS (2015). Current trends in environmental analysis of human metabolite conjugates of pharmaceuticals. *Trends Environ Anal Chem* 5, 8-17. (DOI:10.1016/j.teac.2015.01.002)

Rhu MH, Jha A, Ojo OO, Mahood TH, Basu S, Detillieux KA, Nikoobakht N, Wong CS, Loewen M, Becker AB, Halayko AJ (2014). Chronic exposure to perfluorinated compounds: Impact on airway hyperresponsiveness and inflammation. *Am J Physiol Lung Cell Mol Physiol* 307, L765-L774. (DOI:10.1152/ajplung.00100.2014)

Dai S, Wong CS, Qiu J, Wang M, Chai T, Fan L, Yang S (2014). Enantioselective accumulation of chiral polychlorinated biphenyls in lotus plant (*Nelumbonucifera* spp.) *J Haz Mat* 280, 612-618. (DOI:10.1016/j.hazmat.2014.08.034)

Challis JK, Hanson ML, Friesen KJ, Wong CS (2014). A critical assessment of the photodegradation of pharmaceuticals in aquatic environments: Defining our current understanding and identifying knowledge gaps. *Environ Sci: Processes Impacts* 16, 672-696. (DOI:10.1039/C3EM00615H). Included as one of 20 papers in journal's 2014 Most Accessed Articles themed collection.

Cardinal P, Anderson JC, Carlson JC, Low JE, Challis JK, Beattie SA, Bartel CN, Elliott AD, Montero OF, Lokesh S, Favreau A, Kozlova T, Knapp CW, Hanson ML, Wong CS (2014). Macrophytes may not contribute significantly to removal of nutrients, pharmaceuticals, and antibiotic resistance in model surface constructed wetlands. *Sci Total Environ* 482-483, 294-304. (DOI:10.1016/j.scitotenv.2014.02.095)

Bews HJ, Carlson JC, Jha A, Basu S, Halayko AJ, Wong CS (2014). Simultaneous quantification of simvastatin and simvastatin hydroxy acid in blood serum at physiological pH by ultrahigh performance liquid chromatography-tandem mass spectrometry (UHPLC/MS/MS). *J Chromatogr B* 947-948, 145-150. (DOI:10.1016/j.jchromb.2013.12.030)

- Lu Z, Fisk AT, Kovacs K, Lydersen C, McKinney M, Tomy GT, Rosenberg B, McMeans BC, Muir DCG, Wong CS (2014). Temporal and spatial variation in polychlorinated biphenyl chiral signatures of the Greenland shark (*Somniosus microcephalus*) and its arctic marine food web. *Environ Pollut* 186, 216-225. (DOI:10.1016/j.envpol.2013.12.005)
- Lu Z, Kania-Korwel I, Lehmler H-J, Wong CS (2013). Stereoselective formation of mono- and di-hydroxylated polychlorinated biphenyls by rat cytochrome P450 2B1. *Environ Sci Technol* 47, 12184-12192. (DOI:10.1021/es402838f)
- Liu L-Y, Wei G-L, Wang J-Z, Guan Y-F, Wong CS, Zeng EY (2013). Anthropogenic activities have contributed moderately to increased inputs of organic materials in marginal seas off China. *Environ Sci Technol* 47, 11414-11422. (DOI:10.1021/es401751k)
- Lu Z, Ma G, Veinot JGC, Wong CS (2013). Disruption of biomolecule function by nanoparticles: How do gold nanoparticles affect Phase I biotransformation of persistent organic pollutants? *Chemosphere* 93, 123-132. (DOI:10.1016/j.chemosphere.2013.05.004). Selected as Editors Choice Article, June 2015
- Challis JK, Carlson JC, Friesen KJ, Hanson ML, Wong CS (2013). Aquatic photochemistry of the sulfonamide antibiotic sulfapyridine. *J Photochem Photobiol A* 262, 14-21. (DOI:10.1016/j.jphotochem.2013.04.009)
- Anderson JC, Carlson JC, Low JE, Challis JK, Wong CS, Knapp CW, Hanson ML (2013). Performance of a constructed wetland in Grand Marais, Manitoba, Canada: Removal of nutrients, pharmaceuticals, and antibiotic resistance genes from municipal wastewater. *Chem Cent J* 7, 54. (DOI:10.1186/1752-153X-7-54)
- Carlson JC, Challis JK, Hanson ML, Wong CS (2013). Stability of pharmaceuticals and other polar organic compounds stored on Polar Organic Chemical Integrative Samplers and solid phase extraction cartridges. *Environ Toxicol Chem* 32, 337-344. (DOI:10.1002/etc.2076)
- Liu L-Y, Wang J-Z, Wong CS, Qiu J-W, Zeng EY (2013). Applications of multiple geochemical markers to investigate organic pollution in a dynamic coastal zone. *Environ Toxicol Chem* 32, 312-319. (DOI:10.1002/etc.2062)
- Carlson JC, Anderson JC, Low JE, Cardinal P, MacKenzie SD, Beattie SA, Challis JK, Bennett RJ, Meronek SS, Wilks RPA, Buhay WM, Wong CS, Hanson ML (2013). Presence and hazards of nutrients and emerging organic micropollutants from sewage lagoon discharges into Dead Horse Creek, Manitoba, Canada. *Sci Total Environ* 445-446, 64-78. (DOI:10.1016/j.scitotenv.2012.11.100)
- Cooper VI, Letcher RJ, Dietz R, Sonne C, Wong CS (2012). Quantification of achiral and chiral

methysulfonyl polychlorinated biphenyl metabolites by column-switching liquid chromatography-atmospheric pressure photoionization-tandem mass spectrometry. *J Chromatogr A* 1268, 64-73. (DOI:10.1016/j.chroma.2012.10.030)

Dai S-H, Zhao H-L, Wang M, Wong CS, Chai T-T, Yang S-M, Qiu J (2012). Determination of polychlorinated biphenyl enantiomers in lotus root and sediment by chiral gas chromatography-mass spectrometry. *Chin J Anal Chem* 40, 1758-1763. (DOI:10.1016/S1872-2040(11)60582-3)

Yu H-Y, Hu Y-A, Bao L-J, Wong CS, Zeng EY (2012). Sedimentary loadings and ecological significance of polycyclic aromatic hydrocarbons in a typical mariculture zone of South China. *J Environ Monit* 14, 2685-2691. (DOI:10.1039/C2EM30292F)

Asher BJ, Wang Y, De Silva AO, Backus S, Muir DCG, Wong CS, Martin JW (2012). Enantiospecific perfluorooctane sulfonate (PFOS) analysis reveals evidence for the source contribution of PFOS-precursors to the Lake Ontario foodweb. *Environ Sci Technol* 46, 7653-7660. (DOI:10.1021/es301160r)

Zhang B-Z, Zhang K, Li S-M, Wong CS, Zeng EY (2012). Size-dependent dry deposition of polybrominated diphenyl ethers in urban Guangzhou, China. *Environ Sci Technol* 46, 7207-7214. (DOI:10.1021/es300944a)

Liu L-Y, Wang J-Z, Wei G-L, Guang Y-F, Wong CS, Zeng EY (2012). Sediment records of polycyclic aromatic hydrocarbons (PAHs) in the continental shelf of China: Implications for evolving anthropogenic impacts. *Environ Sci Technol* 46, 6497-6504. (DOI:10.1021/es300474z)

Asher BJ, Ross MS, Wong CS (2012). Tracking chiral polychlorinated biphenyls near a hazardous waste incinerator: Fresh emissions or weathered revolatilization? *Environ Toxicol Chem* 31, 1453-1460. (DOI:10.1002/etc.1852)

Zhang K, Zhang B-Z, Li S-M, Wong CS, Zeng EY (2012). Calculated respiratory exposure to indoor sizefractionated polycyclic aromatic hydrocarbons in an urban environment. *Sci Total Environ* 431, 245-251. (DOI:10.1016/j.scitotenv.2012.05.059)

Ross MS, Wong CS, Martin JW (2012). Isomer-specific biotransformation of perfluorooctane sulfonamide in Sprague-Dawley rats. *Environ Sci Technol* 46, 3196-3203. (DOI:10.1021/es204028v)

Ross MS, Letcher RJ, McKinney MA, Sonne C, Dietz R, Wong CS (2011). Comparison of the enantiomer distribution of chiral organochlorine contaminants in captive West Greenland sled dogs and polar bears from Baffin Bay. In *Chiral Pesticides: Stereoselectivity and Its Consequences* (AW Garrison, J Gan, W Liu, eds.), American Chemical Society Symposium Series 1085, 45-63. (DOI:10.1021/bk-2011-1085.ch003)

Lu Z, Wong CS (2011). Factors affecting Phase I enantioselective biotransformation of chiral polychlorinated biphenyls by rat cytochrome P-450 isozyme. *Environ Sci Technol* 45, 8298-8305. (DOI:10.1021/es200673q)

Ross MS, Pulster EL, Ejsmont MB, Chow EA, Hessel CM, Maruya KA, Wong CS (2011). Enantioselectivity of polychlorinated biphenyl atropisomers in sediment and biota from the Turtle/Brunswick River Estuary, Georgia, USA. *Mar Poll Bull* 63, 548-555. (DOI:10.1016/j.marpolbul.2011.02.001)

Ross MS, Wong CS (2010). Comparison of electrospray ionization, atmospheric pressure photoionization, and anion attachment atmospheric pressure photoionization for the analysis of hexabromocyclododecane enantiomers in environmental samples. *J Chromatogr A* 1217, 7855-7863. (DOI:10.1016/j.chroma.2010.09.083)

Sharpe RL, Benskin JP, Laarman AH, MacLeod SL, Martin JW, Wong CS, Goss GG (2010). Perfluorooctane sulfonate toxicity, isomer-specific accumulation, and maternal transfer in zebrafish (*Danio rerio*) and rainbow trout (*Oncorhynchus mykiss*). *Environ Toxicol Chem* 29, 1957-1966. (DOI:10.1002/etc.257)

Clark RJ, Veinot JGC, Wong CS (2010). Nanoparticles in the environment: The good, the bad, and the ugly. In *Trace Analysis with Nanomaterials* (DT Pierce and JX Zhao, eds.), Wiley-VCH (ISBN 978-3-527-32350-0), 255-282. 38.

Lehmle H-J, Harrad SJ, Huhnerfuss H, Kania-Korwel I, Lee CM, Lu Z, Wong CS (2010). Chiral polychlorinated biphenyl transport, metabolism, and distribution: A review. *Environ Sci Technol* 44, 2757-2766. (DOI:10.1021/es902208u)

MacLeod SL, Wong CS (2010). Loadings, trends, comparisons, and fate of achiral and chiral pharmaceuticals in wastewaters from urban tertiary and rural aerated lagoon treatments. *Wat Res* 44, 533-544. (DOI:doi:10.1016/j.watres.2009.09.056)

Wong CS, Warner NA (2010). Chirality as an environmental forensics tool. In *Persistent Organic Pollutants* (Harrad SJ, ed.), Wiley (ISBN 978-1-4051-6930-1), 71-136. (DOI:10.1002/9780470684122.ch4)

Wong CS, Elmayergi BH (2009). Chiral environmental contaminants. In *Encyclopedia of Analytical Chemistry* (Meyers EA, ed.), Supplementary Volumes S1-S3, Wiley, 220-244. (DOI:10.1002/9780470027318.a9055)

Wong CS, MacLeod SL (2009). JEM Spotlight: Recent advances in analysis of pharmaceuticals in the aquatic environment. *J Environ Monit* 11, 923-936. (DOI:10.1039/b819464e). Featured as a Spotlight Article, foreword written by B Escher (Escher, 2009, *J Environ Monit* 11, 921-922). One

of top 10 most downloaded articles (May 2009, January 2010, March 2010).

Asher BJ, D'Agostino LA, Way JD, Wong CS, Harynuk JJ (2009). Comparison of peak integration methods for the determination of enantiomeric fraction in environmental samples. *Chemosphere* 75, 1042-1048. (DOI:10.1016/j.chemosphere.2009.01.041)

Warner NA, Martin JW, Wong CS (2009). Chiral polychlorinated biphenyls are biotransformed enantioselectively by mammalian cytochrome P-450 isozymes to form hydroxylated metabolites. *Environ Sci Technol* 43, 114-121. (DOI:10.1021/es802237u)

Ross MS, Verreault J, Letcher RJ, Gabrielsen GW, Wong CS (2008). Chiral organochlorine contaminants in blood and eggs of glaucous gulls (*Larus hyperboreus*) from the Norwegian Arctic. *Environ Sci Technol* 42, 7181-7186. (DOI:10.1021/es8000147)

Wong CS (2008). Chiral polychlorinated biphenyls and their metabolites. In *PCBs: Human and Environmental Disposition and Toxicity* (Hanson LG and Robertson LW, eds.), University of Illinois Press (ISBN 978-0-252-03254-7), 30-50.

MacLeod SL, McClure EL, Wong CS (2007). Laboratory calibration and field deployment of the Polar Organic Chemical Integrative Sampler for pharmaceuticals and personal care products in wastewater and surface water. *Environ Toxicol Chem* 26, 2517-2529. (DOI:10.1897/07-238.1)

MacLeod SL, Sudhir P, Wong CS (2007). Stereoisomer analysis of wastewater-derived beta-blockers, selective serotonin re-uptake inhibitors, and salbutamol by high performance liquid chromatography-tandem mass spectrometry. *J Chromatogr A* 1170, 23-33. (DOI:10.1016/j.chroma.2007.09.010)

McClure EL, Wong CS (2007). Solid phase microextraction of macrolide, trimethoprim and sulfonamide antibiotics in wastewaters. *J Chromatogr A* 1169, 53-62. (DOI:10.1016/j.chroma.2007.08.062)

Asher BJ, Wong CS, Rodenburg LA (2007). Chiral source apportionment of polychlorinated biphenyls to the Hudson River estuary atmosphere and food web. *Environ Sci Technol* 41, 6163-6169. (DOI:10.1021/es070763n)

Wong CS, Pakdeesusuk U, Morrissey JA, Lee CM, Coates JT, Garrison AW, Mabury SA, Marvin CH, Muir DCG (2007). Enantiomeric composition of chiral polychlorinated biphenyl atropisomers in dated sediment cores. *Environ Toxicol Chem* 26, 254-263. (DOI:10.1897/06-164R.1)

Morrissey JA, Bleackley DS, Warner NA, Wong CS (2007). Enantiomer fractions of chiral polychlorinated biphenyls in three selected Standard Reference Materials. *Chemosphere* 66, 326-331. (DOI:10.1016/j.chemosphere.2006.04.085)

Nikolai LN, McClure EL, MacLeod SL, Wong CS (2006). Stereoisomer quantification of the β -blocker drugs atenolol, metoprolol, and propranolol in wastewaters by chiral high performance liquid chromatography-tandem mass spectrometry. *J Chromatogr A* 1131, 103-109. (DOI:10.1016/j.chroma.2006.07.033)

Wong CS (2006). Environmental fate processes and biochemical transformations of chiral emerging organic pollutants. *Anal Bioanal Chem* 386, 544-558. (DOI:10.1007/s00216-006-0424-3)

Warner NA, Wong CS (2006). The aquatic invertebrate *Mysis relicta* can eliminate chiral organochlorine compounds enantioselectively. *Environ Sci Technol* 40, 4158-4164. (DOI:10.1021/es052166b)

Buckman AH, Wong CS, Chow EA, Brown SB, Solomon KR, Fisk AT (2006). Biotransformation of polychlorinated biphenyls (PCBs) and bioformation of hydroxylated PCBs in fish. *Aquat Toxicol* 78, 176-185. (DOI:10.1016/j.aquatox.2006.02.033)

Warner NA, Norstrom RJ, Wong CS, Fisk AT (2005). Enantiomeric fractions of chiral polychlorinated biphenyls provide insights on biotransformation capacity of Arctic biota. *Environ Toxicol Chem* 24, 2763-2767. (DOI:10.1897/05-121R.1)

Wong CS, Mabury SA, Whittle DM, Backus SM, Teixeira C, DeVault DS, Bronte CR, Muir DCG (2004). Organochlorine compounds in Lake Superior: Chiral polychlorinated biphenyls and biotransformation in the aquatic food web. *Environ Sci Technol* 38, 84-92. (DOI:10.1021/es0346983)

Martin JW, Mabury SA, Wong CS, Noventa F, Solomon KR, Alaee M, Muir DCG (2003). Airborne haloacetic acids. *Environ Sci Technol* 37, 2889-2897. (DOI:10.1021/es026345u)

Hoekstra PF, Braune BM, Wong CS, Elkin B, Muir DCG (2003). Profile of chlorinated contaminants, including selected chiral compounds, in wolverine (*Gulo gulo*) livers from the Canadian Arctic. *Chemosphere* 50, 551-560. (DOI:10.1016/S0045-6535(03)00514-9)

Pakdeesusuk U, Jones WJ, Lee CM, Garrison AW, O'Neill WL, Freedman DL, Coates JT, Wong CS (2003). Changes in enantiomeric fraction (EF) during microbial reductive dechlorination of PCB 132, PCB 149, and Aroclor 1254 in Lake Hartwell sediment microcosms. *Environ Sci Technol* 37, 1100-1107. (DOI:10.1021/es026039g)

Wong CS, Muir DCG, Mabury SA (2003). Measurement of $^{13}\text{C}/^{12}\text{C}$ of chloroacetic acids by gas chromatography/combustion/isotope ratio mass spectrometry (GC/C/IRMS). *Chemosphere* 50, 903-909. (DOI:10.1016/S0045-6535(02)00696-3)

Singer AC, Wong CS, Crowley DE (2002). Differential enantioselective transformation of atropisomeric polychlorinated biphenyls by multiple bacterial strains with differing inducing

compounds. *Appl Environ Microbiol* 68, 5756-5759. (DOI:10.1128/AEM.68.11.5756-5759.2002)

Wong CS, Hoekstra PF, Karlsson H, Backus SM, Mabury SA, Muir DCG (2002). Enantiomer fractions of chiral organochlorine pesticides and polychlorinated biphenyls in Standard and Certified Reference Materials. *Chemosphere* 49, 1339-1347. (DOI:10.1016/S0045-6535(02)00166-2)

Hoekstra PF, Wong CS, O'Hara TM, Solomon KR, Mabury SA, Muir DCG (2002). Enantiomer-specific accumulation of PCB atropisomers in the bowhead whale (*Balaena mysticetus*). *Environ Sci Technol* 36, 1419-1425. (DOI:10.1021/es015763g)

Wong CS, Lau F, Clark M, Mabury SA, Muir DCG (2002). Rainbow trout (*Oncorhynchus mykiss*) can eliminate chiral organochlorine compounds enantioselectively. *Environ Sci Technol* 36, 1257-1262. (DOI:10.1021/es0156791)

Wong CS, Garrison AW, Smith PD, Foreman WT (2001). Enantiomeric composition of chiral polychlorinated biphenyl atropisomers in aquatic and riparian biota. *Environ Sci Technol* 35, 2448-2454. (DOI:10.1021/es0018872)

Wong CS, Capel PD, Nowell LH (2001). National-scale, field-based evaluation of the biota-sediment accumulation factor model. *Environ Sci Technol* 35, 1709-1715. (DOI:10.1021/es0016452)

Wong CS, Garrison AW, Foreman WT (2001). Enantiomeric composition of chiral polychlorinated biphenyl atropisomers in aquatic bed sediment. *Environ Sci Technol* 35, 33-39. (DOI:10.1021/es0012570)

Wong CS, Capel PD, Nowell LH (2000). Organochlorine pesticides and PCBs in stream sediment and aquatic biota: Initial results from the National Water-Quality Assessment Program, 1992-1995. US Geological Survey Water Resources Investigations Report 00-4053.

Wong CS, Garrison AW (2000). Enantiomer separation of polychlorinated biphenyl atropisomers and polychlorinated biphenyl retention behavior on modified cyclodextrin capillary gas chromatography columns. *J Chromatogr A* 866, 213-220. (DOI:10.1016/S0021-9673(99)01104-8)

Wong CS, Sanders G, Engstrom DR, Long DT, Swackhamer DL, Eisenreich SJ (1995). Accumulation, inventory, and diagenesis of chlorinated hydrocarbons in Lake Ontario sediments. *Environ Sci Technol* 29, 2661-2672. (DOI:10.1021/es00010a031)

Golden KA, Wong CS, Jeremiason JD, Eisenreich SJ, Sanders G, Hallgren J, Swackhamer DL, Engstrom DR, Long DT (1993). Accumulation and preliminary inventory of organochlorines in Great Lakes sediments. *Water Sci Technol* 28 (8-9), 19-31.

Wong CS, Chin Y-P, Gschwend PM (1992). Sorption of radon-222 to natural sediments. *Geochim Cosmochim Acta* 56, 3923-3932. (DOI:10.1016/0016-7037(92)90006-5)

Stolzenbach KD, Newman KA, Wong CS (1992). Aggregation of fine particles at the sediment-water interface. *J Geophys Res* 97 (C11), 17889-17898. (DOI:10.1029/92JC01827)

Technical Reports

Wong, C.S., S. Sauers, K.C. Schiff, R. Butler, A.C. Mehinto. 2026. Southern California Bight 2023 Regional Monitoring Program: Volume VII-A. Chemical Contaminants in Coastal Bivalves. Technical Report 1482.A. Southern California Coastal Water Research Project. Costa Mesa, CA.

Wong, C.S., K.C. Schiff, R. Butler. 2026. Southern California Bight 2023 Regional Monitoring Program: Volume II. Sediment Chemistry. Technical Report 1469. Southern California Coastal Water Research Project. Costa Mesa, CA.

Wong, C.S., W. Lao, S. Sauers, D. Nguyen, L.M. Thornton Hampton. 2024. Multimedia investigations of microplastic concentrations in the Los Angeles and San Gabriel Rivers. Technical Report 1389. Southern California Coastal Water Research Project. Costa Mesa, CA.

Wong, C.S., W. Lao, S. Sauers, D. Nguyen, R. Butler, D. Lin. 2024. Characterizing the Removal of Microplastics by California Wastewater Treatment Plants: Implications for Management Strategies. Technical Report 1378. Southern California Coastal Water Research Project. Costa Mesa, CA.

Wong, C.S., S. Sauers, W. Lao. 2024. Stormwater Monitoring Coalition Laboratory Guidance Document (Fourth Edition). Technical Report 1379. Southern California Coastal Water Research Project. Costa Mesa, CA.

Maruya, K., C.S. Wong. 2020. Evaluating Analytical Methods for Detecting Unknown Chemicals in Recycled Water. Technical Report 1164. Water Research Foundation. Alexandria, VA.

Du, B., C.S. Wong, K. McLaughlin, K.C. Schiff. 2020. Southern California Bight 2018 Regional Monitoring Program: Volume II. Sediment Chemistry. Technical Report 1130. Southern California Coastal Water Research Project. Costa Mesa, CA.

Du, B., J. Smith, K. Maruya, C.S. Wong. 2020. Comparison of Novel Passive Sampling Methods to Identify Cyanotoxins and their Sources. Technical Report 1123. Southern California Coastal Water Research Project. Costa Mesa, CA.