

# Dr. Charles Wong

Department Head

Chemistry Department

Southern California Coastal Water Research Project

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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-present

Adjunct faculty member University of Manitoba. 2014-present

Adjunct faculty member University of Alberta. 2008-2012

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

Chair Professor, Jinan University. 2016-present

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

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, Steinke 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, 758-76. (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, 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- $\beta$ -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  $\beta$ 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 (*Nelumbo nucifera* 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, Rosenburg 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 methylsulfonyl 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 size-fractionated 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)

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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. Lehmler H-J, Harrad SJ, Hühnerfuss 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)

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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).

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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)

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Nikolai LN, McClure EL, MacLeod SL, Wong CS (2006). Stereoisomer quantification of the  $\beta$ -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)

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