

MICHAEL DODD  
*Curriculum Vitae*

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University of Washington  
Department of Civil and Environmental Engineering  
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EDUCATIONAL HISTORY

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Swiss Federal Institute of Technology-Zurich (ETH-Zurich); Zurich, Switzerland  
Ph.D., Environmental Sciences, 2008  
Dissertation: “Characterization of Ozone-Based Oxidative Treatment as a Means of Eliminating the Target-Specific Biological Activities of Municipal Wastewater-Borne Antibacterial Compounds”

Georgia Institute of Technology; Atlanta, GA  
M.S., Environmental Engineering, 2003  
Thesis: “Chemical Oxidation of Aquatic Antibiotic Microcontaminants by Free and Combined Chlorine”

Georgia Institute of Technology; Atlanta, GA  
B.S., Civil Engineering, 2001

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EMPLOYMENT HISTORY

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University of Washington, Department of Civil and Environmental Engineering  
Seattle, WA (USA)  
Associate Professor (9/15 – present)  
Assistant Professor (9/09 – 9/15)

Yale University, Environmental Engineering Program  
New Haven, CT (USA)  
Postdoctoral Research Fellow (10/08 – 9/09)

Swiss Federal Institute of Aquatic Science and Technology (Eawag), Department of Water Resources and Drinking Water  
Duebendorf, Switzerland  
Graduate Research Assistant (9/03 – 9/08)

Georgia Institute of Technology, School of Civil and Environmental Engineering  
Atlanta, GA (USA)  
Graduate Research Assistant (8/01 – 5/03)

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AWARDS AND HONORS

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- Chair’s Award for Department Service; 2019; University of Washington Department of Civil and Environmental Engineering

- Allan and Inger Osberg Endowed Professorship (2018-2023)
- Visiting Professorship; 2017; École Polytechnique Fédérale de Lausanne (EPFL); School of Architecture, Civil and Environmental Engineering (ENAC)
- Outstanding Reviewer Award; 2013; *Journal of Environmental Engineering*, American Society of Civil Engineers
- Advisor to recipient of 2013 MWH/AEESP Master's Thesis Award (1<sup>st</sup> Place) – MS graduate Jenna Forsyth
- NSF CAREER Award (2013-2019); Awarded 2012; US NSF
- Outstanding Teacher Award; 2012; University of Washington Department of Civil and Environmental Engineering
- ETH Medal; 2010; Swiss Federal Institute of Technology-Zurich (ETH-Zurich) (awarded to the top 8% of PhD dissertations completed at ETH-Zurich each year)
- Young Scientist Award; 2009; German Chemical Society, Division for Environmental Chemistry and Ecotoxicology
- CH2M Hill/AEESP Outstanding Doctoral Dissertation Award; 2009; Association of Environmental Engineering and Science Professors
- Gaylord Donnelley Environmental Postdoctoral Fellowship (2008-2009); Awarded 2008; Yale Institute for Biospheric Studies
- Excellence in Review Award; 2006; *Environmental Science & Technology*, American Chemical Society
- Outstanding M.S. Thesis; 2003; School of Civil and Environmental Engineering, Georgia Institute of Technology
- Graduate Research Fellowship (2003-2006); Awarded 2002; US NSF
- Science to Achieve Results (STAR) Fellowship (2001-2003); Awarded 2001; US EPA
- Georgia Tech Institute Fellowship (2001-2003); Awarded 2001; Georgia Tech Foundation, Inc.

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#### AFFILIATIONS AND OTHER APPOINTMENTS

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Adjunct Associate Professor, Dept. Env. Occup. Health Sci. (University of Washington) (9/15 – present)  
 Adjunct Assistant Professor, Dept. Env. Occup. Health Sci. (University of Washington) (12/12 – 9/15)

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#### PUBLICATIONS

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**Refereed journal publications: Number of citations indexed by Google Scholar as of 5/13/24 provided in bold (parentheses); total citations = 5440; average citations per paper = 151; h-index = 28, i10-index = 34; 2022 journal impact factor (IF) from Web of Science included in *italicized (parentheses)* just prior to number of citations. Advisees indicated by superscripts – Graduate students<sup>1</sup>, Postdoctoral researchers<sup>2</sup>, Undergraduate students<sup>3</sup>, Visiting/exchange/co-advised/co-mentored graduate students<sup>4</sup>; Coequal authors<sup>†</sup>; Corresponding author(s)\*.**

1. Hu, X.<sup>4</sup>; Zhao, H.N.<sup>4</sup>; Tian, Z.; Peter, K.T.; Dodd, M.C.; Kolodziej, E.P.\* Chemical characteristics, leaching, and stability of the ubiquitous tire rubber-derived toxicant 6PPD-quinone. *Environmental Science: Processes & Impacts* 2023, 25(5), 901-911 (*Journal IF: 5.5*) (**Citations: 18**)

2. Zhao, H.N.<sup>4</sup>; Hu, X.<sup>4</sup>; Tian, Z.; Gonzalez, M.; Rideout, C.A.; Peter, K.T.; Dodd, M.C.\*; Kolodziej, E.P.\* Transformation products of tire rubber antioxidant 6PPD in heterogeneous gas-phase ozonation: identification and environmental occurrence. *Environmental Science & Technology* 2023, 57(14), 5621–5632 (*Journal IF: 11.4*) **(Citations: 28)**
3. Zhao, H.N.<sup>4</sup>; Hu, X.<sup>4</sup>; Gonzalez, M.; Rideout, C.A.; Hobby, G.C.; Fisher, M.F.; McCormick, C.J.; Dodd, M.C.; Kim, K.E.; Tian, Z.; Kolodziej, E.P.\* Screening *p*-phenylenediamine antioxidants, their transformation products, and industrial chemical additives in crumb rubber and elastomeric consumer products. *Environmental Science & Technology* 2023, 57(7), 2779–2791 (*Journal IF: 11.4*) **(Citations: 33)**
4. Patton, S.D.; Dodd, M.C.\*; Liu, H.\* Degradation of 1,4-dioxane by reactive species generated during breakpoint chlorination: proposed mechanisms and implications for water treatment and reuse. *Journal of Hazardous Materials Letters*, 2022, 3, Article 100054 **Invited Paper** (*Journal IF: Not yet Indexed*) **(Citations: 9)**
5. He, H.<sup>1\*</sup>; Choi, Y.<sup>4</sup>; Wu, S.J.<sup>3</sup>; Fang, X.<sup>3</sup>; Anderson, A.K.<sup>3</sup>; Liou, S.-Y.<sup>1</sup>; Roberts, M.C.; Lee, Y.; Dodd, M.C.\* Application of nucleotide-based kinetic modeling approaches to predicting antibiotic resistance gene degradation during UV- and chlorine-based wastewater disinfection processes: from bench to full-scale. *Environmental Science & Technology* 2022, 56(21), 15141–15155 (*Journal IF: 11.4*) **(Citations: 7)**
6. Hu, X.<sup>4</sup>; Zhao, H.N.<sup>4</sup>; Tian, Z.; Peter, K.T.; Dodd, M.C.\*; Kolodziej, E.P.\* Transformation product formation upon heterogeneous ozonation of the tire rubber antioxidant 6PPD (*N*-(1,3-dimethylbutyl)-*N'*-phenyl-*p*-phenylenediamine). *Environmental Science & Technology Letters* 2022, 9(5), 413–419 (*Journal IF: 10.9*) **(Citations: 50)**
7. Qiao, Z.; Ye, Y. Szczuka, A. Harrison, K.R.; Dodd, M.C.; Wigginton, K.R.\* Reactivity of viral nucleic acids with chlorine and the impact of virus encapsidation. *Environmental Science & Technology* 2021, 56(1), 218-227 (*Journal IF: 11.4*) **(Citations: 18)**
8. Yoon, Y.<sup>4,†</sup>; He, H.<sup>1,†</sup>; Dodd, M.C.\*; Lee, Y.\* Degradation and deactivation of plasmid-encoded antibiotic resistance genes during exposure to ozone and chlorine. *Water Research* 2021, 202, Article 117408 (*Journal IF: 12.8*) **(Citations: 22)**
9. Liou, S.-Y.<sup>1</sup>; Dodd, M.C.\* Evaluation of hydroxyl radical and reactive chlorine species generation from the superoxide/hypochlorous acid reaction as the basis for a novel advanced oxidation process. *Water Research* 2021, 200, Article 117142 (*Journal IF: 12.8*) **(Citations: 28)**
10. Choi, Y.<sup>4</sup>; He, H.<sup>1</sup>; Dodd, M.C.; Lee, Y.\* Degradation kinetics of antibiotic resistance gene *mecA* of methicillin-resistant *Staphylococcus aureus* (MRSA) during water disinfection with chlorine, ozone, and ultraviolet light. *Environmental Science & Technology* 2021, 55(4), 2541-2552 (*Journal IF: 11.4*) **(Citations: 47)**
11. Tian, Z.; Zhao, H.; Peter, K.T.; Gonzalez, M.; Wetzel, J.; Wu, C.; Hu, X.; Prat, J.; Murdock, E.; Hettinger, R.; Cortina, A.E.; Biswas, R.G.; Kock, F.V.C.; Soong, R.; Jenne, A.; Du, B.; Hou, F.; He, H.<sup>1</sup>; Lundeen, R.; Gilbreath, A.; Sutton, R.; Scholz, N.L.; Davis, J.W.; Dodd, M.C.; Simpson, A.; McIntyre, J.K.; Kolodziej, E.P.\* A ubiquitous tire rubber-derived chemical induces acute mortality in coho salmon. *Science* 2021, 371(6525), 185–189. **United States National Champion article for the Frontiers Planet Prize 2023** (*Journal IF: 56.9*) **(Citations: 704)**
12. Cheng, S; Wu; Y.-P.; Young, T.R.<sup>1</sup>; Dodd, M.C.; Wu, J.; Zhang, H.; Huo, Z.-L.\*; Qian, Y.-T.; Li, Y.; Li, W.-T.\*; Li, A.-M. Rapid determination of trace haloacetic acids in water and wastewater using non-suppressed ion chromatography with electrospray ionization-tandem mass spectrometry. *Science of The Total Environment* 2021, 754, Article 142297 (*Journal IF: 9.8*) **(Citations: 18)**
13. Young, T.R.<sup>1</sup>; Deem, S.; Leslie, J.C.; Salo-Zieman, V.; He, H.<sup>1</sup>; Dodd, M.C.\* Drivers of disinfection byproduct formation and speciation in small, chlorinated coastal groundwater systems: Relative roles of bromide and organic matter, and the need for improved source water characterization and monitoring. *Environmental Science: Water Research & Technology* 2020, 6(12), 3361–3379 (*Journal IF: 5.0*) **(Citations: 10)**

14. Nihemaiti, M.<sup>†</sup>; Yoon, Y.<sup>4,†</sup>; He, H.<sup>1</sup>; Dodd, M.C.; Croué, J.-P.\*; Lee, Y.\* Degradation and deactivation of a plasmid-encoded extracellular antibiotic resistance gene during separate and combined exposures to UV<sub>254</sub> and radicals. *Water Research* 2020, 182, Article 115921 (*Journal IF: 12.8*) **(Citations: 56)**
15. Young, T.R.<sup>1</sup>; Cheng, S.; Li, W.-T.; Dodd, M.C.\* Rapid, high-sensitivity analysis of oxyhalides by non-suppressed ion chromatography-electrospray ionization-mass spectrometry: application to ClO<sub>4</sub><sup>-</sup>, ClO<sub>3</sub><sup>-</sup>, ClO<sub>2</sub><sup>-</sup>, and BrO<sub>3</sub><sup>-</sup> quantification during sunlight/chlorine advanced oxidation. *Environmental Science: Water Research & Technology* 2020, 6(9), 2580–2596. **Invited Paper: Drinking Water Oxidation and Disinfection Processes Themed Issue** (*Journal IF: 5.0*) **(Citations: 11)**
16. He, H.<sup>1</sup>; Zhou, P.<sup>1,†</sup>; Shimabuku, K. K.<sup>1,†</sup>; Fang, X.<sup>3</sup>; Li, S.<sup>3</sup>; Lee, Y.; Dodd, M. C.\* Degradation and deactivation of bacterial antibiotic resistance genes during exposure to free chlorine, monochloramine, chlorine dioxide, ozone, ultraviolet light, and hydroxyl radical. *Environmental Science & Technology* 2019, 53(4), 2013–2026. **ACS Editors' Choice Selection** (*Journal IF: 11.4*) **(Citations: 166)**
17. Young, T. R.<sup>1</sup>; Li, W.<sup>4</sup>; Guo, A.<sup>3</sup>; Korshin, G. V.; Dodd, M. C.\* Characterization of disinfection byproduct formation and associated changes to dissolved organic matter during solar photolysis of free available chlorine. *Water Research* 2018, 146, 318-327 (*Journal IF: 12.8*) **(Citations: 52)**
18. Nelson, K. L.\*; Boehm, A. B.; Davies-Colley, R. J.; Dodd, M. C.; Kohn, T.; Linden, K. G.; Liu, Y.; Maraccini, P. A.; McNeill, K.; Mitch, W. A.; Nguyen, T. H.; Parker, K. M.; Rodriguez, R. A.; Sassoubre, L. M.; Silverman, A. I.; Wigginton, K. R.; Zepp, R. G. Sunlight-mediated inactivation of health-relevant microorganisms in water: a review of mechanisms and modeling approaches. *Environmental Science: Processes & Impacts* 2018, 20, 1089-1122 (*Journal IF: 5.5*) **(Citations: 258)**
19. Yoon, Y.; Dodd, M. C.; Lee, Y.\* Elimination of transforming activity and gene degradation during UV and UV/H<sub>2</sub>O<sub>2</sub> treatment of plasmid-encoded antibiotic resistance genes. *Environmental Science: Water Research & Technology* 2018, 4, 1239-1251 (*Journal IF: 5.0*) **(Citations: 67)**
20. Yoon, Y.-G.; Chung, H.J.; Di, D.Y.W.; Dodd, M.C.; Hur, H.-G., Lee, Y.\* Inactivation efficiency of plasmid-encoded antibiotic resistance genes during water treatment with chlorine, UV, and UV/H<sub>2</sub>O<sub>2</sub>. *Water Research* 2017, 123, 783-793 (*Journal IF: 12.8*) **(Citations: 223)**
21. Li, W.-T.<sup>4,\*</sup>; Cao, M.-J.; Young, T.R.<sup>1</sup>; Ruffino, B.; Dodd, M.C.; Li, A.-M.\*; Korshin, G.V. Application of UV absorbance and fluorescence indicators to assess the formation of biodegradable dissolved organic carbon and bromate during ozonation. *Water Research* 2017, 111, 154-162 (*Journal IF: 12.8*) **(Citations: 71)**
22. Zhou, P.<sup>1</sup>; Di Giovanni, G.D.; Meschke, J.S.; Dodd, M.C.\* Enhanced inactivation of *Cryptosporidium parvum* oocysts during solar photolysis of free available chlorine. *Environmental Science & Technology Letters* 2014, 1(11), 453–458 (*Journal IF: 10.9*) **(Citations: 64)**
23. Karlesa, A.; De Vera, G.A.D.; Dodd, M.C.; Park, J.; Espino, M.P.B.; Lee, Y.\* Ferrate(VI) oxidation of β-lactam antibiotics: reaction kinetics, antibacterial activity changes, and transformation products. *Environmental Science & Technology* 2014, 48(17), 10380–10389 (*Journal IF: 11.4*) **(Citations: 121)**
24. Méndez-Díaz J.D.<sup>2</sup>; Shimabuku, K.K.<sup>1</sup>; Ma, J.<sup>3</sup>; Enumah, Z.O.; Pignatello, J.J.\*; Mitch, W.A.\*; Dodd, M.C.\* Sunlight-driven photochemical halogenation of dissolved organic matter in seawater: A natural abiotic source of organobromine and organoiodine. *Environmental Science & Technology* 2014, 48(13), 7418-7427 (*Journal IF: 11.4*) **(Citations: 92)**
25. Forsyth, J.E.<sup>1</sup>; Zhou, P.<sup>1</sup>; Mao, N.Q.<sup>3</sup>; Asato, S.<sup>3</sup>; Meschke, J.S.; Dodd, M.C.\* Enhanced inactivation of *Bacillus subtilis* spores during solar photolysis of free available chlorine. *Environmental Science & Technology* 2013, 47(22), 12976-12984 (*Journal IF: 11.4*) **(Citations: 84)**
26. Dodd, M.C.\* Potential impacts of disinfection processes on elimination and deactivation of antibiotic resistance genes during water and wastewater treatment. *Journal of Environmental Monitoring* 2012,

- 14(7), 1754-1771. **Invited Paper: Emerging Investigators Special Issue** (*Journal IF: 2.2*)  
**(Citations: 460)**
27. Dodd, M. C.\*; Rentsch, D.; Singer, H. P.; Kohler, H.-P. E.; von Gunten, U. Transformation of  $\beta$ -lactam antibacterial agents during aqueous ozonation: Reaction pathways and quantitative bioassay-directed characterization of biologically-active oxidation products. *Environmental Science & Technology* 2010, 44(15), 5940-5948 (*Journal IF: 11.4*) **(Citations: 125)**
  28. Paul, T.; Dodd, M. C.; Strathmann, T. J.\* Photolytic and photocatalytic decomposition of aqueous ciprofloxacin: Transformation products and residual antibacterial activity. *Water Research* 2010, 44(10), 3121-3132 (*Journal IF: 12.8*) **(Citations: 369)**
  29. Dodd, M. C.; Kohler, H.-P. E.; von Gunten, U.\* Oxidation of antibacterial compounds by ozone and hydroxyl radical: Elimination of biological activity during aqueous ozonation processes. *Environmental Science & Technology* 2009, 43(7), 2498–2504 (*Journal IF: 11.4*) **(Citations: 310)**
  30. Dodd, M. C.<sup>†</sup>; Zuleeg, S.<sup>†</sup>; von Gunten, U.; Pronk, W.\* Ozonation of source-separated urine for resource recovery and waste minimization: Process modeling, reaction chemistry, and operational considerations. *Environmental Science & Technology* 2008, 42(24), 9329-9337 (*Journal IF: 11.4*) **(Citations: 95)**
  31. Suarez, S.<sup>†</sup>; Dodd, M. C.<sup>†</sup>; Omil, F.; von Gunten, U.\* Kinetics of triclosan oxidation by aqueous ozone and consequent loss of antibacterial activity: relevance to municipal wastewater ozonation. *Water Research* 2007, 41(12), 2481-2490 (*Journal IF: 12.8*) **(Citations: 195)**
  32. Dodd, M. C.; Huang, C.-H.\* Aqueous chlorination of the antibacterial agent trimethoprim: Reaction kinetics and pathways. *Water Research* 2007, 41(3), 647-655 (*Journal IF: 12.8*) **(Citations: 174)**
  33. Dodd, M. C.<sup>†</sup>; Vu, N. D.<sup>†</sup>; Ammann, A.; Le, V. C.; Kiessner, R.; Berg, M.; Pham, H. V.; Cao, T. H.; von Gunten, U.\* Kinetics and mechanistic aspects of As(III) oxidation by aqueous chlorine, chloramines, and ozone. *Environmental Science & Technology* 2006, 40(10), 3285-3292 (*Journal IF: 11.4*) **(Citations: 203)**
  34. Dodd, M. C.; Buffle, M.-O.; von Gunten, U.\* Oxidation of antibacterial molecules by aqueous ozone: Moiety-specific reaction kinetics and application to ozone-based wastewater treatment. *Environmental Science & Technology* 2006, 40(6), 1969-1977 (*Journal IF: 11.4*) **(Citations: 567)**
  35. Dodd, M. C.; Shah, A. D.; von Gunten, U.; Huang, C.-H.\* Interactions of fluoroquinolone antibacterial agents with aqueous chlorine: Reaction kinetics, mechanisms, and transformation pathways. *Environmental Science & Technology* 2005, 39(18), 7065-7076 (*Journal IF: 11.4*) **(Citations: 287)**
  36. Dodd, M. C.; Huang, C.-H.\* Transformation of the antibacterial agent sulfamethoxazole in reactions with chlorine: Kinetics, mechanisms, and pathways. *Environmental Science & Technology* 2004, 38(21), 5607-5615 (*Journal IF: 11.4*) **(Citations: 398)**

#### **Papers accepted, in review/revision, or in preparation**

1. Wang, J.; Huo, L.; Bian, K.; He, H.; Dodd, M.C.; Pinto, A.J.; Huang, C.-H.\* Efficacy and mechanism of antibiotic resistance gene degradation and cell membrane damage during ultraviolet advanced oxidation processes. Submitted to *ACS ES&T Water*
2. He, H.<sup>1\*</sup>; Liou, S.-Y.<sup>1</sup>; Choi, Y.<sup>4</sup>; Meschke, J.S.; Roberts, M.C.; Lee, Y.; Dodd, M.C.\* Degradation and deactivation of intracellular bacterial antibiotic resistance genes by commonly-used healthcare and personal care disinfectants. In preparation
3. Wang, R.<sup>4</sup>; Dodd, M.C.\*; Kolodziej, E.P.\* Kinetics, mechanisms, and reaction pathways of 1,3-diphenylguanidine chlorination: Central roles of metastable N-chlorinated intermediates. In preparation
4. Hooper, J.<sup>4</sup>; Ray, J.R.\*; Dodd, M.C.\* Critical review of natural photochemically-generated reactive reducing species in microheterogeneous environments and their potential importance for contaminant degradation. In preparation

5. Liou, S.-Y.<sup>1,\*</sup>; Dodd, M.C.\* Activation and quenching of hydrogen peroxide and free available chlorine at non-ferrous/non-cuprous metal(loid) oxide surfaces. In preparation

#### Conference proceedings and other non-journal articles

1. Liou, S.-Y.<sup>1</sup>; Dodd, M.C. “Generation of hydroxyl radical and reactive chlorine species from the superoxide/hypochlorous acid reaction: Application as a novel advanced oxidation process”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Tacoma, WA. November 7-10, 2021
2. He, H.<sup>1</sup>; Zhou, P.<sup>1</sup>; Shimabuku, K. K.<sup>1</sup>; Fang, X.<sup>3</sup>; Anderson, A.<sup>3</sup>; Dodd, M. C. Quantification and prediction of degradation and deactivation kinetics of antibiotic resistance genes during disinfection/oxidation processes: From bench-scale to full-scale. Water Environment Federation Disinfection and Public Health Conference, Portland, OR. July 29-31, 2018
3. He, H.<sup>1</sup>; Zhou, P.<sup>1</sup>; Shimabuku, K.K.<sup>1</sup>; Fang, X.<sup>3</sup>; Anderson, A.<sup>3</sup>; Dodd, M.C. “Antibiotic resistance gene degradation and deactivation kinetics during bench- and full-scale disinfection and oxidation processes”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Portland, OR. November 12-16, 2017
4. Young, T.<sup>1</sup>; Guo, A.<sup>3</sup>; He, H.<sup>1</sup>; Dodd, M.C. “Formation of disinfection byproducts during solar photolysis of aqueous free chlorine”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Portland, OR. November 12-16, 2017
5. Zhou, P.<sup>1</sup>; Di Giovanni, G.D.; Meschke, J.S.; Dodd, M.C. “Mechanistic elucidation and modeling of enhanced microbial inactivation during solar photolysis of chlorine to ROS and ozone”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Salt Lake City, UT. November 15-19, 2015
6. Forsyth, J.E.<sup>1</sup>; Mao, N.Q.<sup>3</sup>; Meschke, J.S.; Dodd, M.C. “Photochemical activation of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms”, Water Environment Federation Disinfection and Public Health Conference, Indianapolis, IN. February 24-26, 2013
7. Zhou, P.<sup>1</sup>; Li, S.<sup>3</sup>; Dodd, M.C. “Oxidation and disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes via water and wastewater”, Water Environment Federation Disinfection and Public Health Conference, Indianapolis, IN. February 24-26, 2013
8. Dodd, M. C.; Kohler, H.-P. E.; Rentsch, D.; von Gunten, U. “Wastewater ozonation as a barrier to conveyance of chemical determinants of antibacterial resistance through municipal water (re)use cycles”, 5th International Water Association (IWA) Leading-Edge Conference on Water and Wastewater Technologies, Zurich, Switzerland. June 1-4, 2008
9. Paul, T.; Dodd, M. C.; von Gunten, U.; Strathmann, T.J. “Residual antibacterial activity of photolytically and photocatalytically-treated aqueous solutions of the antibacterial agent ciprofloxacin”, extended abstracts of the 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008
10. Suarez, S.; Dodd, M. C.; Omil, F.; Lema, J. M. “Kinetics of fluoxetine and triclosan oxidation during municipal wastewater ozonation”, proceedings of the 6th European Congress of Chemical Engineering, Copenhagen, Denmark. September 16-21, 2007
11. Dodd, M. C.; Kohler, H.-P. E.; von Gunten, U. “Oxidation of antibacterial and biocidal compounds by ozone and hydroxyl radicals: Elimination of biological activity during aqueous ozonation processes”, extended abstracts of MICROPOL & ECOHAZARD 2007 - the 5th IWA Specialised Conference on Assessment and Control of Micropollutants / Hazardous Substances in Water, Frankfurt am Main, Germany. June 17-20, 2007
12. Dodd, M. C.; Suarez, S.; Kohler, H.-P. E.; von Gunten, U. “Moiety-specific oxidation reactions and consequent changes in biochemical activities of antibacterial compounds during aqueous ozonation processes”, extended abstracts of the 233rd American Chemical Society (ACS) National Meeting, Chicago, IL. March 25-29, 2007

13. Dodd, M. C.; Vu, N. D.; Le, V. C.; Berg, M.; von Gunten, U. "As(III) oxidation by chlorine and ozone: Using kinetics measurements to model reactions during treatment of natural waters", proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Denver, CO. November 5-9, 2006
14. Dodd, M. C.; von Gunten, U. "Selective oxidation of antibacterial molecules during ozonation of municipal wastewater", extended abstracts of the International Ozone Association (IOA) 17th World Ozone Congress, Strasbourg, France. August 22-25, 2005
15. Dodd, M. C.; von Gunten, U. "Oxidation of key functional groups in prominent clinical antibacterial agents: Potential for elimination of antibacterial activity via treatment with ozone", extended abstracts of the 228th American Chemical Society (ACS) National Meeting, Philadelphia, PA. August 23-27, 2004.
16. Dodd, M. C.; Huang, C.-H. "Chemical oxidation of aquatic antibiotic microcontaminants by free and combined chlorine", proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Philadelphia, PA. November 2-5, 2003.

### **Book chapters**

Huang, C.-H.; Dodd, M. C.; Shah, A. D. "Reactions of Antibacterial Agents with Aqueous Chlorine under Relevant Water Treatment Conditions", In: *Fate of Pharmaceuticals in the Environment and Water Treatment Systems*, D. Aga, Ed.; CRC Press, Taylor & Francis Books, 2007.

### **Patents Submitted and/or Awarded**

Liou, S.-Y.; Dodd, M.C. Advanced Oxidation Using Superoxide Radical and Free Available Chlorine. U.S. Patent Application 18/299,033, Document ID US 2023/0331602 A1, October 19, 2023

### **Technical Reports**

Wigginton, K.; Rockey, N.; Dodd, M. C.; Kohn, T.; Pecson, B. M.; Fontaine, N. A.; Salveson, A.; Bischel, H. *Review of Non-Culture-Based Methods for Pathogen Monitoring in Potable Reuse*. The Water Research Foundation: 2018; PROJECT NO. Reuse-14-17/4768.

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## OTHER SCHOLARLY ACTIVITY

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### **Invited lectures and seminars**

1. School of Civil and Environmental Engineering, Georgia Institute of Technology, *Characterizing and predicting antibiotic resistance gene fate during disinfection processes: Insights and implications for (waste)water treatment, healthcare, and beyond*, March 27, 2024
2. Gordon Research Conference – Environmental Sciences: Water, Holderness School, Holderness, NH *Predicting antibiotic resistance gene fate during disinfection processes: insights into DNA-disinfectant reactions and implications for (waste)water treatment, healthcare, and beyond*, June 20, 2022
3. 2022 IUVA Research Innovation Symposium, University of Colorado – Boulder, Boulder, CO *Exploring UV/chlorine (photo)chemistry in another light: Observations on microbial inactivation, DBP formation, and DOM transformation during chlorine photolysis above 280 nm*, May 23, 2022
4. American Chemical Society Spring 2022 National Meeting, Symposium In Honor of Prof. Urs von Gunten for the 2022 ACS Award for Creative Advances in Environmental Science & Technology;

- San Diego, CA, *A radical approach to chlorine activation: Harnessing the superoxide-hypochlorous acid reaction for advanced oxidative treatment*, March 22, 2022
5. Pacifichem 2021 – The International Chemical Congress of Pacific Basin Societies, Symposium on UV Photochemistry for Water: Implications for Safe Water Disinfection and Oxidation Treatment Applications; Virtual Meeting, *Characterization and prediction of antibiotic resistance gene degradation during UV-based (waste)water disinfection processes: From bench-scale to full-scale*, December 19, 2021
  6. Department of Environmental & Occupational Health Sciences Seminar Series, University of Washington; Seattle, WA, *Antibiotic resistance gene fate during disinfection processes: Insights into DNA-disinfectant reactions and implications for (waste)water treatment, healthcare, and beyond*, November 19, 2020
  7. Laboratory Medicine Grand Rounds, Division of Clinical Microbiology, Department of Laboratory Medicine, University of Washington Medical Center, Seattle, WA, *Characterization of antibiotic resistance gene fate during disinfection processes: Degradation kinetics, biological activity loss, and practical implications*, October 16, 2019
  8. German Water Chemistry Society, 8th Late Summer Workshop 2019, Haltern am See, Germany, *Antibiotic resistance gene fate during (waste)water disinfection processes: Degradation, deactivation, and implications for mitigation of antibiotic resistance dissemination*, September 23, 2019
  9. Gordon Research Conference – Water Disinfection, Byproducts and Health, Mount Holyoke College, South Hadley, MA, *Characterization of antibiotic resistance gene fate during disinfection processes: Degradation kinetics, biological activity loss, and practical implications*, July 30, 2019
  10. HEARD 2018 – CSF Monte Verità, Ascona, Switzerland, *Antibiotic resistance gene fate during (waste)water disinfection processes: Degradation, deactivation, and implications for mitigation of antibiotic resistance dissemination*, September 18, 2018
  11. School of Architecture, Civil and Environmental Engineering, École Polytechnique Fédérale de Lausanne (EPFL), *Characterization of disinfection processes as barriers to the dissemination of antibiotic resistance genes in water, wastewater, and health care settings*, April 11, 2017
  12. Department of Water Resources and Drinking Water, Swiss Federal Institute of Aquatic Science and Technology (Eawag), *Looking at water chlorination in a new light: Enhanced microbial inactivation and disinfection byproduct formation during sunlight-driven photolysis of chlorine*, March 27, 2017
  13. Eawag Seminar Series, Swiss Federal Institute of Aquatic Science and Technology (Eawag), *Characterization of disinfection processes as barriers to the dissemination of antibiotic resistance genes in water, wastewater, and health care settings*, October 21, 2016
  14. Department of Civil and Environmental Engineering, Stanford University, *Degradation and deactivation of bacterial antibiotic resistance genes during disinfection processes*, May 15, 2015
  15. Special Session on Characterization of the Fate and Effects of Contaminants of Emerging Concern by Chemical and Biological Methods at Pittcon 2015, New Orleans, LA, *Characterization of bacterial antibiotic resistance gene deactivation during water and wastewater disinfection processes*, March 8, 2015
  16. Department of Civil, Environmental, and Geo- Engineering, University of Minnesota, *Degradation and deactivation of bacterial antibiotic resistance genes during water and healthcare disinfection processes*, November 14, 2014
  17. 12<sup>th</sup> Annual United Nations University and Gwangju Institute of Science and Technology Joint Programme Symposium, Da Nang, Vietnam, *Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes in environmental systems*, October 28, 2014
  18. International Symposium on Chemicals of Emerging Concern at the 97<sup>th</sup> Canadian Chemistry Conference and Exposition, Vancouver, British Columbia, *Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance in environmental systems*, June 5, 2014

19. Department of Civil, Environmental, and Architectural Engineering, University of Colorado – Boulder, *Looking at water chlorination in a new light: Photochemical activation of free chlorine for enhanced disinfection of chlorine-resistant microorganisms*, October 25, 2013
20. Natural Science Seminar Series, College of Science and Engineering, Seattle University, *Looking at water chlorination in a new light: Photochemical activation of free chlorine for enhanced disinfection of chlorine-resistant microorganisms*, October 11, 2013
21. ReNUWIt Sunlight Symposium, Stanford University, *Sunlight-driven photolysis of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms*, April 2, 2013
22. Department of Civil and Environmental Engineering, University of Michigan, *Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance via water and wastewater*, March 13, 2013
23. Department of Environmental Sciences and Engineering, University of North Carolina – Chapel Hill, *Sunlight driven photolysis of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms*, January 29, 2013
24. Department of Civil and Environmental Engineering, Duke University, *Oxidation and disinfection processes as barriers to the dissemination of antibiotic resistance via water and wastewater*, January 28, 2013
25. Department of Civil and Environmental Engineering, Georgia Institute of Technology, *Oxidation and disinfection processes as barriers to the development and dissemination of antibiotic resistance via water and wastewater*, October 29, 2012
26. Department of Civil and Environmental Engineering, Temple University, *Oxidation/disinfection processes as barriers to the development and dissemination of antibiotic resistance via water and wastewater*, August 22, 2012
27. Department of Civil and Environmental Engineering, Virginia Polytechnic Institute and State University, *Oxidation/disinfection processes as barriers to the development and dissemination of antibiotic resistance via water and wastewater*, August 15, 2012
28. Puget Sound Institute, University of Washington – Tacoma, *Quantifying abiotic organohalogen formation in seawater during exposure to solar radiation*. November 28, 2011
29. Division of Environmental and Biomolecular Systems, Oregon Health and Science University, *Oxidation and disinfection processes as barriers to the development and dissemination of antibiotic resistance in water and wastewater*. November 4, 2011.
30. Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign. *Halide activation by natural chemical processes: Water treatment applications and potential implications for marine geochemistry*. April 8, 2011.
31. University of Trier, Trier, Germany. *Characterization of ozone-based oxidative treatment as a means of eliminating the target-specific biological activities of municipal wastewater-borne antibacterial compounds*, German Chemical Society, Division of Environmental Chemistry and Ecotoxicology, Annual Meeting. September 23, 2009
32. Department of Civil Engineering, University of Minnesota, Minneapolis, MN. *Attenuating the micropollutant-derived ecotoxicological burden of municipal wastewaters via conventional and advanced oxidation processes: Implications for the role of oxidative wastewater treatment in sustainable regional water (re)use*, July 31, 2009
33. Yale Institute for Biospheric Studies, Yale University, New Haven, CT. *Photochemical generation of reactive halogen species under UVA Light and their interactions with dissolved organic matter in saline waters*, April 22, 2009
34. Environmental Engineering Program, Yale University, New Haven, CT. *Ozonation of source-separated urine for resource recovery and waste minimization: Process modeling, reaction chemistry, and operational considerations*, March 24, 2009
35. Department of Civil and Environmental Engineering, University of Washington. *Attenuating the micropollutant-derived ecotoxicological burden of municipal wastewaters via conventional and*

- advanced oxidation processes: Implications for the role of oxidative wastewater treatment in sustainable regional water (re)use*, April 14, 2008
36. RWTH Aachen University, Aachen, Germany. *Application of ozone for micropollutant oxidation during municipal wastewater treatment: An overview of reaction chemistry, process fundamentals, and practical results*, November 28, 2007
  37. School of Architecture, Civil, and Environmental Engineering, École Polytechnique Fédérale de Lausanne. *Mechanistic and toxicological aspects of antibacterial agent transformation during chlorination and ozonation processes: Implications for the design and optimization of oxidative wastewater treatment applications*, July 6, 2007
  38. Division of Environmental Science and Engineering, National University of Singapore. *Mechanistic and toxicological aspects of antibacterial agent transformation during chlorination and ozonation processes: Implications for the design and optimization of oxidative wastewater treatment applications*, June 25, 2007
  39. Department of Energy, Environmental, and Chemical Engineering, Washington University in St. Louis. *Transformation of wastewater-borne antibacterial agents during chlorination and ozonation processes: Kinetics, reaction pathways, and toxicological consequences of structural modifications*, April 3, 2007
  40. Department of Geography and Environmental Engineering, Johns Hopkins University. *Transformation of wastewater-borne antibacterial agents during chlorination and ozonation processes: Kinetics, reaction pathways, and toxicological consequences of structural modifications*, March 27, 2007
  41. Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder. *Transformation of wastewater-borne antibacterial agents during chlorination and ozonation processes: Kinetics, reaction pathways, and toxicological consequences of structural modifications*, March 5, 2007
  42. Department of Civil and Environmental Engineering, University of Massachusetts Amherst. *Transformation of wastewater-borne antibacterial agents during chlorination and ozonation processes: Kinetics, reaction pathways, and toxicological consequences of structural modifications*, February 23, 2007.

#### **Oral presentations given at conferences (presenter in bold)**

1. **Dodd, M.C.** “Predicting antibiotic resistance gene fate during disinfection processes: insights into DNA-disinfectant reactions and implications for (waste)water treatment, healthcare, and beyond”, Gordon Research Conference – Environmental Sciences: Water, Holderness School, Holderness, NH. June 20, 2022
2. **Dodd, M.C.** “Exploring UV/chlorine (photo)chemistry in another light: observations on microbial inactivation, DBP formation, and DOM transformation during chlorine photolysis above 280 nm”, 2022 IUVA Research Innovation Symposium, University of Colorado – Boulder, Boulder, CO. May 23, 2022
3. **Zhao, H.N.**; Hu, X.; Tian, Z.; Peter, K.T.; Gonzalez, M.; Rideout, C.A.; Dodd, M.C.; Kolodziej, E.P. “Identification and environmental occurrence of the ozonation transformation products of tire rubber antioxidant 6PPD”, American Chemical Society Spring 2022 National Meeting, San Diego, CA. March 20-24, 2022
4. **Hu, X.**; Zhao, H.N.; Tian, Z.; Peter, K.T.; Dodd, M.C.; Kolodziej, E.P. “Heterogeneous ozonation of the tire rubber antioxidant 6PPD”, American Chemical Society Spring 2022 National Meeting, San Diego, CA. March 20-24, 2022
5. **Dodd, M.C.**; Liou, S.-Y. “A radical approach to chlorine activation: Harnessing the superoxide-hypochlorous acid reaction for advanced oxidative treatment”, American Chemical Society Spring 2022 National Meeting, San Diego, CA. March 20-24, 2022

6. **Liou, S.-Y.**; Dodd, M.C. “Reactive species production during decomposition of aqueous hydrogen peroxide and free available chlorine at non-ferrous metal(loid) oxide surfaces”, American Chemical Society Spring 2022 National Meeting, San Diego, CA. March 20-24, 2022
7. He, H.; Choi, Y.; Yoon, Y.; Lee, Y.; **Dodd, M.C.** “Characterization and prediction of antibiotic resistance gene degradation during UV-based (waste)water disinfection processes: From bench-scale to full-scale”, Pacificchem 2021 – The International Chemical Congress of Pacific Basin Societies, Virtual Meeting. December 16-21, 2021
8. **Hu, X.**; Zhao, H.N.; Tian, Z.; Peter, K.T.; Dodd, M.C.; Kolodziej, E.P. “Heterogeneous ozonation of the tire rubber antioxidant 6PPD”, SETAC North America 42nd Annual Meeting, Virtual Meeting. November 14-18, 2021
9. **Liou, S.-Y.**; Dodd, M.C. “Generation of hydroxyl radical and reactive chlorine species from the superoxide/hypochlorous acid reaction: Application as a novel advanced oxidation process”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Tacoma, WA. November 7-10, 2021
10. He, H.; Choi, Y.; Yoon, Y.; Lee, Y.; **Dodd, M.C.** “Degradation and deactivation of bacterial antibiotic resistance genes during chlorine-based wastewater disinfection: Significance of chlorine speciation and application of nucleotide-based kinetic modeling approaches”, Emcon 2021: New Issues in Emerging Contaminants Research and Management, Virtual Meeting. September 13-14, 2021
11. **He, H.**; Choi, Y.; Lee, Y.; Dodd, M.C. “Degradation and deactivation of bacterial antibiotic resistance genes during UV light irradiation: Development of a composition-based predictive modeling approach and its application in bench- and full-scale (waste)water treatment”, American Chemical Society Spring 2021 National Meeting, Virtual Meeting. April 5-16, 2021
12. **He, H.**; Wu, S.; Fang, X.; Anderson, A.K.; Roberts, M.C.; Lee, Y.; Dodd, M.C. “Predicting antibiotic resistance gene degradation during physical/chemical disinfection of wastewater”, AWWA International Symposium on Water Reuse, Atlanta, GA. February 10-11, 2020
13. **Dodd, M.C.** “Antibiotic resistance gene fate during (waste)water disinfection processes: Degradation, deactivation, and implications for mitigation of antibiotic resistance dissemination”, German Water Chemistry Society, 8th Late Summer Workshop 2019, Haltern am See, Germany. September 22-25, 2019
14. **Dodd, M.C.** “Characterization of antibiotic resistance gene fate during disinfection processes: Degradation kinetics, biological activity loss, and practical implications”, Gordon Research Conference: Water Disinfection, Byproducts and Health, Mount Holyoke College, South Hadley, MA. July 28-August 2, 2019
15. **He, H.**; Zhou, P.; Shimabuku, K.K.; Fang, X.; Anderson, A.; Dodd, M.C. “Quantification and prediction of degradation and deactivation kinetics of antibiotic resistance genes during disinfection/oxidation processes: from bench-scale to full-scale”, Water Environment Federation Disinfection and Reuse Symposium, Portland, OR. July 29-31, 2018
16. **He, H.**; Zhou, P.; Shimabuku, K.K.; Fang, X.; Anderson, A.; Dodd, M.C. “Development and application of predictive models for antibiotic resistance gene degradation and deactivation kinetics during bench-scale and full-scale disinfection processes”, 255th American Chemical Society National Meeting, New Orleans, LA. March 18-22, 2018
17. **Young, T.**; Li, W.-T.; Guo, A.; Korshin, G.V.; Canonica, S.; von Gunten, U.; Dodd, M.C. “Characterization of changes in disinfection byproduct formation and dissolved organic matter properties during solar photolysis of aqueous free chlorine”, 255th American Chemical Society National Meeting, New Orleans, LA. March 18-22, 2018
18. **He, H.**; Zhou, P.; Shimabuku, K.K.; Fang, X.; Anderson, A.; Dodd, M.C. “Antibiotic resistance gene degradation and deactivation kinetics during bench- and full-scale disinfection and oxidation processes”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Portland, OR. November 12-16, 2017

19. **Young, T.**; Guo, A.; Zhou, P.; Meschke, J.S.; Dodd, M.C. “Disinfection and disinfection byproduct formation during solar irradiation of chlorinated drinking water”, Water and Environment Students Talks (WEST), University of British Columbia, Vancouver, BC June 11–13, 2017 \***Winner of Canadian Association on Water Quality Phillip H. Jones Award (1 of 2 awards)**
20. **He, H.**; Fang, X.; Anderson, A.; Dodd, M.C. “Antibiotic resistance gene degradation and deactivation kinetics during bench- and full-scale disinfection processes”, Water and Environment Students Talks (WEST), University of British Columbia, Vancouver, BC June 11–13, 2017
21. **Li, W.-T.**; Cao, M.-J.; Dodd, M.C.; Li, A.-M.; Korshin, G.V. “Use of an online LED UV fluorescence sensor for high time resolution DOM monitoring and predicting DBPs formation potential during water treatment”, 252nd American Chemical Society National Meeting, Philadelphia, PA. August 21-25, 2016
22. **Zhou, P.**; Di Giovanni, G.D.; Meschke, J.S.; Dodd, M.C. “Looking at water chlorination in a new light: Mechanistic elucidation and modeling of enhanced microbial inactivation during solar photolysis of chlorine to reactive oxygen species and ozone”, Pacifichem 2015, Honolulu, HI. December 15-20, 2015
23. Zhou, P.; Di Giovanni, G.D.; Meschke, J.S.; **Dodd, M.C.** “Mechanistic elucidation and modeling of enhanced microbial inactivation during solar photolysis of chlorine to ROS and ozone”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Salt Lake City, UT. November 15-19, 2015
24. **Dodd, M.C.**; Zhou, P.; Shimabuku, K.K.; Li S. “Characterization of bacterial antibiotic resistance gene deactivation during water and wastewater disinfection processes”, Special Session on Characterization of the Fate and Effects of Contaminants of Emerging Concern by Chemical and Biological Methods at Pittcon 2015, New Orleans, LA. March 8, 2015
25. Méndez-Díaz J.D.; Shimabuku, K.K.; Ma, J.; Enumah, Z.O.; Pignatello, J.J.; Mitch, W.A.; **Dodd, M.C.** “Sunlight-driven photochemical bromination and iodination of dissolved organic matter in seawater”, 248th American Chemical Society National Meeting, San Francisco, CA. August 10-14, 2014
26. Zhou, P.; Forsyth, J.E.; Meschke, J.S.; **Dodd, M.C.** “Looking at water chlorination in a new light: Contributions of ozone and hydroxyl radical to inactivation of chlorine-resistant microorganisms during solar photolysis of free chlorine”, 248th American Chemical Society National Meeting, San Francisco, CA. August 10-14, 2014
27. **Shimabuku, K.K.**; Zhou, P.; Dodd, M.C. “Deactivation of antibiotic resistance genes with ozone and hydrogen peroxide”, Water and Environment Students Talks (WEST), University of British Columbia, Vancouver, BC June 8–10, 2014
28. **Zhou, P.**; Meschke, J.S.; Dodd, M.C. “Sunlight-driven photolysis of chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microbial pathogens”, Water and Environment Students Talks (WEST), University of British Columbia, Vancouver, BC June 8–10, 2014
29. **Dodd, M.C.**; Zhou, P.; Shimabuku, K.K. “Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes via water and wastewater”, International Symposium on Chemicals of Emerging Concern at the 97<sup>th</sup> Canadian Chemistry Conference and Exposition, Vancouver, British Columbia. June 5, 2014
30. Perry, S.A.L.; **Speth, T.F.**; Adams, J.Q.; Dodd, M.C. “EPA’s Drinking Water Treatability Database: A Tool for All Drinking Water Professionals”, American Water Works Association (AWWA) Water Quality Technology Conference, Long Beach, CA. November 3-7, 2013
31. **Zhou, P.**; Li, S.; Dodd, M.C. “Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes via water and wastewater. 2013 AEESP 50th Anniversary Conference”, Colorado School of Mines, Golden, CO. July 14-16, 2013
32. **Zhou, P.**; Li, S.; Dodd, M.C. “Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes via water and wastewater”, Micropol & Ecohazard 2013, Zurich, Switzerland. June 16-20, 2013

33. **Zhou, P.**; Li, S.; Dodd, M.C. "Characterization of bacterial antibiotic resistance gene deactivation during disinfection processes", ReNUWIt Sunlight Symposium, Stanford University; Stanford, CA. April 2, 2013
34. Forsyth, J.E.; Mao, N.Q.; Meschke, J.S.; **Dodd, M.C.** "Photochemical activation of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms", Water Environment Federation Disinfection and Public Health Conference, Indianapolis, IN. February 24-26, 2013
35. **Zhou, P.**; Li, S.; Dodd, M.C. "Disinfection processes as barriers to the dissemination of bacterial antibiotic resistance genes via water and wastewater", Water Environment Federation Disinfection and Public Health Conference, Indianapolis, IN. February 24-26, 2013
36. Forsyth, J.E.; Mao, N.Q.; Meschke, J.S.; **Dodd, M.C.** "Photochemical activation of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms", 244th American Chemical Society National Meeting, Philadelphia, PA. August 19-23, 2012
37. **Zhou, P.**; Li, S.; Dodd, M.C. "Comparison of common water disinfectants in their ability to deactivate bacterial antibiotic resistant genes", 244th American Chemical Society National Meeting, Philadelphia, PA. August 19-23, 2012
38. Forsyth, J.E.; Mao, N.Q.; Meschke, J.S.; **Dodd, M.C.** "Photochemical activation of free chlorine to reactive oxygen species for enhanced inactivation of chlorine-resistant microorganisms", International Ultraviolet Association Conference MOVING FORWARD: Sustainable UV Solutions to Meet Evolving Regulatory Challenges Washington, D.C.; Tuesday, August 12-14, 2012
39. **Dodd, M.C.**; Fagnant, C.S. "Optimization of solar free chlorine production for decentralized, energy-efficient disinfection of compromised drinking water resources", 242nd American Chemical Society (ACS) National Meeting, Denver, CO. August 28-September 1, 2011
40. **Dodd, M.C.**; Zhou, P.; Rossier, C., Gough, H.L., Davidson, S.K. "Kinetics and mechanisms of bacterial DNA deactivation by common drinking water and wastewater disinfectants", 242nd American Chemical Society (ACS) National Meeting, Denver, CO. August 28-September 1, 2011
41. **Dodd, M.C.**; Méndez-Díaz J.D., J. Enumah, Z.O.; Pignatello, J.J.; Mitch, W.A. "Quantifying abiotic bromination of natural organic matter in seawater during exposure to solar radiation and ambient ozone", Fourth IWA Specialty Conference on Natural Organic Matter, Costa Mesa, CA, July 27-29, 2011
42. **Dodd, M. C.**; Zuleeg, S.; Pronk, W. von Gunten, U. "Ozonation of source-separated urine for resource recovery and waste minimization: Process modeling, reaction chemistry, and operational considerations.", Association of Environmental Engineering and Science Professors (AEESP) 2009 Conference, University of Iowa, Iowa City, IA. July 27, 2009
43. **Dodd, M. C.**; Kohler, H.-P. E.; Rentsch, D.; von Gunten, U. "Wastewater ozonation as a barrier to conveyance of chemical determinants of antibacterial resistance through municipal water (re)use cycles", 5th International Water Association (IWA) Leading-Edge Conference on Water and Wastewater Technologies, Zurich, Switzerland. June 1-4, 2008
44. **Paul, T.**; Dodd, M. C.; von Gunten, U.; Strathmann, T.J. "Residual antibacterial activity of photolytically and photocatalytically-treated aqueous solutions of the antibacterial agent ciprofloxacin", extended abstracts of the 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008
45. **Suarez, S.**; Dodd, M. C.; Omil, F.; Lema, J. M. "Kinetics of fluoxetine and triclosan oxidation during municipal wastewater ozonation", proceedings of the 6th European Congress of Chemical Engineering, Copenhagen, Denmark. September 16-21, 2007
46. **Dodd, M. C.**; Kohler, H.-P. E.; von Gunten, U. "Oxidation of antibacterial and biocidal compounds by ozone and hydroxyl radicals: Elimination of biological activity during aqueous ozonation processes", extended abstracts of MICROPOL & ECOHAZARD 2007 - the 5th IWA Specialised Conference on Assessment and Control of Micropollutants / Hazardous Substances in Water, Frankfurt am Main, Germany. June 17-20, 2007

47. **Dodd, M. C.**; Suarez, S.; Kohler, H.-P. E.; von Gunten, U. “Moiety-specific oxidation reactions and consequent changes in biochemical activities of antibacterial compounds during aqueous ozonation processes”, extended abstracts of the 233rd American Chemical Society (ACS) National Meeting, Chicago, IL. March 25-29, 2007
48. **Dodd, M. C.**; Vu, N. D.; Le, V. C.; Berg, M.; von Gunten, U. “As(III) oxidation by chlorine and ozone: Using kinetics measurements to model reactions during treatment of natural waters”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Denver, CO. November 5-9, 2006
49. **Dodd, M. C.**; von Gunten, U. “Selective oxidation of antibacterial molecules during ozonation of municipal wastewater”, extended abstracts of the International Ozone Association (IOA) 17th World Ozone Congress, Strasbourg, France. August 22-25, 2005
50. **Dodd, M. C.**; von Gunten, U. “Oxidation of key functional groups in prominent clinical antibacterial agents: Potential for elimination of antibacterial activity via treatment with ozone”, extended abstracts of the 228th American Chemical Society (ACS) National Meeting, Philadelphia, PA. August 23-27, 2004.
51. **Dodd, M. C.**; Huang, C.-H. “Chemical oxidation of aquatic antibiotic microcontaminants by free and combined chlorine”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Philadelphia, PA. November 2-5, 2003.

#### **Poster presentations given at conferences (presenter in bold)**

1. **Liou, S.-Y.**; Dodd, M.C. “Reactive species production during decomposition of aqueous hydrogen peroxide and free available chlorine at non-ferrous metal(loid) oxide surfaces”, Gordon Research Conference – Environmental Sciences: Water, Holderness School, Holderness, NH. June 20, 2022
2. **Hu, X.**; Zhao, H.N.; Tian, Z.; Peter, K.T.; Dodd, M.C.; Kolodziej, E.P. “Heterogeneous ozonation of the tire rubber antioxidant 6PPD”, Emcon 2021: New Issues in Emerging Contaminants Research and Management, Virtual Meeting. September 13-14, 2021
3. **He, H.**; Wu, S.J.; Fang, X.; Anderson, A.; Dodd, M.C. “Validation and application of a kinetic modeling approach to predict antibiotic resistance gene degradation during chlorine- and UV-based wastewater disinfection processes”, Gordon Research Conference: Water Disinfection, Byproducts and Health, Mount Holyoke College, South Hadley, MA. July 28-August 2, 2019.
4. **Young, T.**; Salhi, E.; von Gunten, U.; Canonica, S.; Dodd, M.C. “Relating organic disinfection byproduct formation to changes in spectral and redox properties of dissolved organic matter during sunlight-driven chlorine photolysis”, Gordon Research Conference: Water Disinfection, Byproducts and Health, Mount Holyoke College, South Hadley, MA. July 28-August 2, 2019. **\*Winner of GRC Poster Award (1 of 3 awards)**
5. **Young, T.**; Kamran, S.; Salhi, E.; Canonica, S.; Dodd, M.C. “Disinfection and disinfection byproduct formation during solar irradiation of chlorinated water”, AWWA Annual Conference and Exposition, Denver, CO, June 9-12, 2019.
6. **Young, T.**; Kamran, S.; Salhi, E.; Canonica, S.; Dodd, M.C. “Disinfection and disinfection byproduct formation during solar irradiation of chlorinated water”, Pacific Northwest Section of AWWA Annual Conference, Vancouver, WA, May 1-3, 2019. **\*1st Place Winner in Student Poster Competition**
7. Young, T.; Guo, A.; **He, H.**; Dodd, M.C. “Formation of disinfection byproducts during solar photolysis of aqueous free chlorine”, proceedings of the American Water Works Association (AWWA) Water Quality Technology Conference, Portland, OR. November 12-16, 2017.
8. **Li, W.-T.**; Abbt-Braun, G.; Dodd, M.C.; Korshin, G.V.; Li, A.-M. “Application of UV and Fluorescence Indices for Assessing the Performance of Ozonation Process: Towards Smart Water Treatment”, European Geosciences Union General Assembly 2017, Vienna, Austria. April 23-28, 2017.

9. **Anderson, A.**; He, H.; Dodd, M.C. “Degradation of antibiotic resistance genes during full-scale and bench-scale wastewater chlorination”, 2016 UW Summer STEM Research Poster Session, University of Washington, Seattle, WA, August 17, 2016.
10. **Young, T.**; Guo, A.; Zhou, P.; Meschke, J.S.; Dodd, M.C. “Organic and inorganic disinfection byproduct formation during solar irradiation of chlorinated drinking water”, Pacific Northwest Section of AWWA Annual Conference, Boise, ID, May 4-6, 2016. **\*3rd Place Winner in Student Poster Competition**
11. **He, H.**; Fang, X.; Dodd, M.C. “Quantification of antibiotic resistance gene degradation during full-scale wastewater disinfection”, Pacific Northwest Section of AWWA Annual Conference, Boise, ID, May 4-6, 2016. **\*2nd Place Winner in Student Poster Competition**
12. **Rott, E.**; Zhou, P.; Dodd, M.C. “Alterations to microorganisms during solar photolysis of free available chlorine”, 2015 UW Summer STEM Research Poster Session, University of Washington, Seattle, WA, August 19, 2015.
13. **Zhou, P.**; Di Giovanni, G.D.; Meschke, J.S.; Dodd, M.C. “Looking at chlorination in a new light: Solar photolysis of chlorine to ozone and hydroxyl radical for inactivation of chlorine-resistant microorganisms”, AWWA Annual Conference and Exposition, Anaheim, CA, June 8-10, 2015.
14. **Guo, A.**; Frehner, A.; Young, T.; Zhou, P.; Dodd, M.C. “Disinfection byproduct formation during solar irradiation of chlorinated drinking water”, 2015 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 15, 2015.
15. **Fang, X.**; He, H.; Dodd, M.C. “Method development for quantifying antibiotic resistance gene degradation during wastewater chlorination”, 2015 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 15, 2015.
16. **Zhou, P.**; Di Giovanni, G.; Meschke, J.S.; Dodd, M.C. “Looking at chlorination in a new light: Solar photolysis of chlorine to ozone and hydroxyl radical for inactivation of chlorine-resistant microorganisms”, Pacific Northwest Section of AWWA Annual Conference, Bellevue, WA, April 29-May 1, 2015. **\*1st Place Winner in Student Poster Competition**
17. **Young, T.**; Guo, A.; Frehner, A.; Zhou, P.; Meschke, J.S.; Dodd, M.C. “Disinfection byproduct formation during solar irradiation of chlorinated drinking water”, Pacific Northwest Section of AWWA Annual Conference, Bellevue, WA, April 29-May 1, 2015. **\*2nd Place Winner in Student Poster Competition (Tie)**
18. **He, H.**; Shimabuku, K.; Dodd, M.C. “Degradation and deactivation of bacterial antibiotic resistance genes by hydroxyl radical”, Pacific Northwest Section of AWWA Annual Conference, Bellevue, WA, April 29-May 1, 2015. **\*2nd Place Winner in Student Poster Competition (Tie)**
19. Shimabuku, K.K.; **Zhou, P.**; Dodd, M.C. “Deactivation of antibiotic resistance genes with ozone and hydrogen peroxide”, 248th American Chemical Society National Meeting, San Francisco, CA, August 10-14, 2014
20. **Wagner, P.**; Zhou, P.; Dodd, M.C. “Inactivation of chlorine-resistant microorganisms by solar photolysis of free chlorine and observation of consequent damage by scanning electron microscopy”, 2014 UW Summer STEM Research Poster Session, University of Washington, Seattle, WA, August 20, 2014.
21. Méndez-Díaz J.D.; Shimabuku, K.K.; Ma, J.; Enumah, Z.O.; Pignatello, J.J.; Mitch, W.A.; **Dodd, M.C.** “Sunlight-driven photochemical halogenation of dissolved organic matter in seawater: A natural abiotic source of organobromine and organoiodine”, Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH, June 22-27, 2014
22. Zhou, P.; Meschke, J.S.; **Dodd, M.C.** “Looking at water chlorination in a new light: Contributions of ozone and hydroxyl radical to inactivation of chlorine-resistant microorganisms during solar photolysis of free chlorine”, Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH, June 22-27, 2014
23. **Sullivan, M.**; Dodd, M.; Kirk, H.; Iverson, H. “Water, water everywhere, but not a drop to drink: Guided-inquiry activities for environmental science”, Process Oriented Guided Inquiry Learning (POGIL) National Meeting, St. Louis, MO, May 31–June 3, 2014

24. **Bell, M.**; Zhou, P.; Beck, N.K.; Meschke, J.S.; Dodd, M.C. "Influences of multivalent cations and natural organic matter on inactivation of *B. Subtilis* spores by free chlorine", 2013 UW Summer STEM Research Poster Session, University of Washington, Seattle, WA, August 21, 2013.
25. **Asato, S.S.**; Zhou, P.; Dodd, M.C. "Quantification of ozone formation during sunlight-driven photolysis of aqueous chlorine", 2013 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 17, 2013.
26. Forsyth, J.E.; Mao, N.Q.; Meschke, J.S.; **Dodd, M.C.** "Enhanced inactivation of chlorine-resistant microorganisms by in situ photolysis of free chlorine", Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH, June 24-29, 2012
27. Zhou, P.; Li, S.; **Dodd, M.C.** "Chemical modification and deactivation of extra- and intracellular antibiotic resistance genes by common drinking water and wastewater disinfectants", Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH, June 24-29, 2012
28. **Zhou, P.**; Li, S.; Dodd, M.C. "Chemical modification and deactivation of bacterial DNA during treatment with common drinking water and wastewater disinfectants", 112th General Meeting of the American Society of Microbiology, San Francisco, CA, June 16-19, 2012.
29. **Forsyth, J.E.**; Mao, N.Q.; Meschke, J.S.; Dodd, M.C. "Activation of free chlorine to hydroxyl radical by simulated sunlight for enhanced inactivation of *B. subtilis* spores", 112th General Meeting of the American Society of Microbiology, San Francisco, CA, June 16-19, 2012.
30. **Zhou, P.**; Li, S.; Dodd, M.C. "Chemical modification and deactivation of bacterial DNA during treatment with common drinking water and wastewater disinfectants", AWWA Annual Conference and Exposition, Dallas, TX, June 10-14, 2012.
31. **Ma, J.**; Méndez-Díaz J.D.; Dodd, M.C. "Halogen redox chemistry at the air-sea interface", 2012 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 18, 2012.
32. **Mao, N.Q.**; Forsyth, J.E.; Meschke, J.S.; Dodd, M.C. "Photolysis rate of chlorine under sunlight in photochemically-enhanced disinfection", 2012 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 18, 2012.
33. **Snow, H.**; Dodd, M.C. "Tidal transport of PCBs in the Duwamish River", 2012 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 18, 2012.
34. **Li, S.**; Zhou, P.; Dodd, M.C. "Deactivation and degradation of antibiotic resistance genes in wastewater disinfection Processes", 2012 Undergraduate Research Symposium, University of Washington, Seattle, WA, May 18, 2012.
35. **Zhou, P.**; Li, S.; Dodd, M.C. "Chemical modification and deactivation of bacterial DNA during treatment with common drinking water and wastewater disinfectants", Pacific Northwest Section of AWWA Annual Conference, Yakima, WA, May 2-4, 2012. **\*1st Place Winner in Student Poster Competition**
36. **Forsyth, J.E.**; Mao, N.Q.; Meschke, J.S.; Dodd, M.C. "Activation of free chlorine to hydroxyl radical by simulated sunlight for enhanced inactivation of *B. subtilis* spores", Pacific Northwest Section of AWWA Annual Conference, Yakima, WA, May 2-4, 2012. **\*2nd Place Winner in Student Poster Competition**
37. **Smoll, K.**; Méndez-Díaz, J.; Dodd, M.C.; Simpson, C.; Onstad, G., "Method development of headspace solid-phase microextraction for the analysis of volatile organohalogen compounds in artificial seawater", University of Washington Summer Undergraduate Research Poster Session, Seattle, WA, August 17, 2011.
38. **Fagnant, C.S.**; Mao, N.Q., Dodd, M.C. "Optimization of solar production of free chlorine for decentralized, energy-efficient disinfection of compromised drinking water sources", AWWA Annual Conference and Exposition, Washington, D.C., June 12-16, 2011.
39. **Fagnant, C.S.**; Dodd, M.C. "Optimization of solar production of free chlorine for decentralized, energy-efficient disinfection of compromised drinking water sources", Pacific Northwest Section of AWWA Annual Conference, Boise, ID, May 4-6, 2011. **\*1st Place Winner in Student Poster Competition**

40. **Dodd, M. C.**; Rentsch, D.; Singer, H. P.; Kohler, H.-P. E.; von Gunten, U. "Transformation of  $\beta$ -lactam antibacterial agents during aqueous ozonation: Reaction pathways and quantitative bioassay-directed characterization of biologically-active oxidation products", Association of Environmental Engineering and Science Professors (AEESP) 2009 Conference, University of Iowa, Iowa City, IA. July 27, 2009.
41. **Paul, T.**; Miller, P. L.; Dodd, M. C.; von Gunten, U.; Machesky, M.; Strathmann, T. J. "Visible light-initiated photocatalytic transformation of fluoroquinolone antibacterial agents," Summit of the National Academy of Engineering Grand Challenges, Durham, NC, March 2-3, 2009.
42. **Dodd, M. C.**; Zuleeg, S.; Pronk, W. von Gunten, U. "Pre-treatment of source-separated urine by ozonation: feasibility and quantitative modeling of mass-transfer limited micropollutant depletion by  $O_3$  and  $\cdot OH$  on the basis of fundamental bimolecular reaction kinetics", MICROPOL & ECOHAZARD 2007 - the 5th IWA Specialised Conference on Assessment and Control of Micropollutants / Hazardous Substances in Water, Frankfurt am Main, Germany. June 17-20, 2007.
43. **Huang, C.-H.**; Dodd, M. C.; Shah, A. D.; von Gunten, U.; Kim, J.-H. "Reactions of antibacterial agents with aqueous chlorine under water treatment conditions", Gordon Research Conference on Drinking Water Disinfection By-Products, Mount Holyoke College, South Hadley, MA. August 13-18, 2006.
44. **Dodd, M. C.**; Vu, N. D.; Ammann, A.; Le, V. C.; Kissner, R.; Berg, M.; von Gunten, U. "Kinetics and mechanistic aspects of As(III) oxidation by aqueous chlorine, chloramines, and ozone: Relevance to drinking water treatment", Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH. June 25-30, 2006.
45. **Dodd, M. C.**; Kohler, H.-P. E.; von Gunten, U. "Moiety-specific oxidation of antibacterial molecules by aqueous ozone: Reaction kinetics, elimination of biochemical activity, and implications for municipal wastewater ozonation", Gordon Research Conference on Environmental Sciences: Water, Holderness School, Plymouth, NH. June 25-30, 2006.

### **Professional society memberships**

American Chemical Society (ACS) – Division of Environmental Chemistry (2003-present)  
 American Water Works Association (AWWA) (2001-present)  
 Association of Environmental Engineering and Science Professors (AEESP) (2006-present)

### **Reviewer for Books/Book Chapters**

Brezonik, P.L.; Arnold, W.A. "Chapter 15 - Chemistry of Chlorine and Other Oxidants/Disinfectants", In: *Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Aquatic Systems*, Second Edition, Oxford University Press, Washington, D.C., USA, 2022.

von Sonntag, C.; von Gunten, U. *Chemistry of Ozone in Water and Wastewater Treatment*, IWA Publishing, London, UK, 2012.

Brezonik, P.L.; Arnold, W.A. "Chapter 13 - Chemistry of Chlorine and Other Oxidants/Disinfectants in Water Treatment", In: *Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Aquatic Systems*, First Edition, Oxford University Press, Washington, D.C., USA, 2011.