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Antibiotic Resistance
Risks in Water
Reuse



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ON THE COVER: While antibiotic resistance is a well-known problem in medicine, lesser known is the enrichment of antibiotics, antibiotic resistant bacteria, and antibiotic resistant genes in wastewater and potentially in water reuse scenarios. This issue's Feature article calls for research in epidemiology, risk assessment, water treatment and delivery to avoid unintended consequences of sustainable water strategies.

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Balancing Water Sustainability and Public Health Goals in the Face of Growing Concerns about Antibiotic Resistance
Amy Pruden*

[dx.doi.org/10.1021/es403883p](https://doi.org/10.1021/es403883p)

Global initiatives are underway to advance the sustainability of urban water infrastructure through measures such as water reuse. However, there are growing concerns that wastewater effluents are enriched in antibiotics, antibiotic resistant bacteria, and antibiotic resistance genes, and thus could serve as a contributing factor to growing rates of antibiotic resistance in human infections. Evidence for the role of the water environment as a source and pathway for the spread of antimicrobial resistance is examined and key knowledge gaps are identified with respect to implications for sustainable water systems. Efforts on the part of engineers along with investment in research in epidemiology, risk assessment, water treatment and water delivery could advance current and future sustainable water strategies and help avoid unintended consequences. Global initiatives are underway to advance the sustainability of urban water infrastructure through measures such as water reuse. However, there are growing concerns that wastewater effluents are enriched in antibiotics, antibiotic resistant bacteria, and antibiotic resistance genes, and thus could serve as a contributing factor to growing rates of antibiotic resistance in human infections. Evidence for the role of the water environment as a source and pathway for the spread of antimicrobial resistance is examined and key knowledge gaps are identified with respect to implications for sustainable water systems. Efforts on the part of engineers along with investment in research in epidemiology, risk assessment, water treatment and water delivery could advance current and future sustainable water strategies and help avoid unintended consequences.

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- 681  [dx.doi.org/10.1021/es404098z](https://doi.org/10.1021/es404098z)
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- 689  [dx.doi.org/10.1021/es403804z](https://doi.org/10.1021/es403804z)
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Polybrominated Diphenyl Ethers, Polychlorinated Biphenyls, and Persistent Pesticides in Serum from the National Health and Nutrition Examination Survey: 2003–2008
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A Physiologically Based Toxicokinetic Model for the Zebrafish *Danio rerio*
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811 dx.doi.org/10.1021/es401549e
Relative Permeability Experiments of Carbon Dioxide Displacing Brine and Their Implications for Carbon Sequestration
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827 dx.doi.org/10.1021/es4028698
Optical and Chemical Characterization of Aerosols Emitted from Coal, Heavy and Light Fuel Oil, and Small-Scale Wood Combustion
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Combustion and NO_x Emission Characteristics with Respect to Staged-Air Damper Opening in a 600 MW_e Down-Fired Pulverized-Coal Furnace under Deep-Air-Staging Conditions
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845  [dx.doi.org/10.1021/es4051567](https://doi.org/10.1021/es4051567)
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854  [dx.doi.org/10.1021/es403995b](https://doi.org/10.1021/es403995b)
Synthesis of Coffinite, U_2SiO_7 , and Structural Investigations of $U_xTh_{(1-x)}SiO_4$ Solid Solutions
Sabrina Labs,* Christoph Hennig, Stephan Weiss, Hilde Curtius, Harald Zänker, and Dirk Bosbach

861  [dx.doi.org/10.1021/es404041v](https://doi.org/10.1021/es404041v)
Ethanol and Air Quality: Influence of Fuel Ethanol Content on Emissions and Fuel Economy of Flexible Fuel Vehicles
Carolyn P. Hubbard, James E. Anderson, and Timothy J. Wallington*

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868 [dx.doi.org/10.1021/es404184q](https://doi.org/10.1021/es404184q)
Comment on "Cancer Risk from Incidental Ingestion Exposures to PAHs Associated with Coal-Tar-Sealed Pavement"
Brian Magee* and Janet Keating-Connoily

870 [dx.doi.org/10.1021/es405078f](https://doi.org/10.1021/es405078f)
Response to Comment on "Cancer Risk from Incidental Ingestion Exposures to PAHs Associated with Coal-Tar-Sealed Pavement"
E. Spencer Williams,* Barbara J. Mahler, and Peter C. Van Metre

Additions and Corrections

872  [dx.doi.org/10.1021/es405255t](https://doi.org/10.1021/es405255t)
Correction to Photochemical Formation of Hydroxyl Radical from Effluent Organic Matter: Role of Composition
Eunkyung Lee, Caitlin M. Glover, and Fernando L. Rosario-Ortiz*