

# Environmental Science Water Research & Technology

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## Cover

See C. K. Remucal and D. Manley, pp. 565-579.  
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## The drinking water exposome

P. J. Vikesland\* and L. Raskin

Guest editors Peter Vikesland and Lutgarde Raskin introduce the Drinking Water Exposome themed issue of *Environmental Science: Water Research & Technology*.

565

## Emerging investigators series: the efficacy of chlorine photolysis as an advanced oxidation process for drinking water treatment

C. K. Remucal\* and D. Manley

The photolysis of hypochlorous acid (HOCl) and hypochlorite (OCl<sup>-</sup>) produces a suite of reactive oxidants, including hydroxyl radicals (<sup>•</sup>OH), chlorine radicals (Cl<sup>•</sup>), and ozone (O<sub>3</sub>).

588

**A human exposome framework for guiding risk management and holistic assessment of recycled water quality**

Emily Garner, Ni Zhu, Laurel Strom, Marc Edwards\* and Amy Pruden\*

In this critical review, we propose that the “human exposome” concept provides guiding principles for water reuse risk management strategies.

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**Critical review of mathematical approaches for quantitative microbial risk assessment (QMRA) of *Legionella* in engineered water systems: research gaps and a new framework**

K. Hamilton\* and C. N. Haas

*Legionella* has been identified as the responsible agent for two-thirds of waterborne disease outbreaks in the United States from 2011–2012.

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614

**Characterising and understanding the impact of microbial biofilms and the extracellular polymeric substance (EPS) matrix in drinking water distribution systems**

Katherine E. Fish,\* A. Mark Osborn and Joby Boxall

Drinking water distribution systems (DWDS) contain complex microbial biofilm communities. Understanding the ecology of these biofilms is critical for effective management of DWDS infrastructure and maintenance of water quality.

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**Emerging investigators series: microbial communities in full-scale drinking water distribution systems – a meta-analysis**

Quyên M. Bautista-de los Santos, Joanna L. Schroeder, Maria C. Sevillano-Rivera, Rungroch Sungthong, Umer Z. Ijaz, William T. Sloan and Ameet J. Pinto\*

In this study, we co-analyze all available 16S rRNA gene sequencing studies from bulk drinking water samples in full-scale drinking water distribution systems.

645

**Resilience of microbial communities in a simulated drinking water distribution system subjected to disturbances: role of conditionally rare taxa and potential implications for antibiotic-resistant bacteria**

V. Gomez-Alvarez, S. Pfaller, J. G. Pressman, D. G. Wahman and R. P. Revetta\*

CIRCOS plots representing the pan-genome and resistome of waterborne resistant bacteria.

658

**Archaeal ammonium oxidation coupled with bacterial nitrite oxidation in a simulated drinking water premise plumbing system**

Gem E. Santillana, Heidi J. Smith, Mark Burr and Anne K. Camper\*

Simulated copper and PVC premise plumbing reactors modeling chloramine decay were monitored for complete nitrification of 0.71 mg NH<sub>4</sub>-N L<sup>-1</sup> ammonium to nitrate with no nitrite detected.

670

**Biofilms in shower hoses – choice of pipe material influences bacterial growth and communities**

Caitlin R. Proctor, Marja Gächter, Stefan Kötzsch, Franziska Rölli, Romina Sigrist, Jean-Claude Walser and Frederik Hammes\*

Flexible polymeric pipe materials are commonly used as shower hoses or connections to faucets in the last meters of building plumbing, but these tend to leach high concentrations of carbon that encourage bacterial growth.

683

**A survey of indicator parameters to monitor regrowth in unchlorinated drinking water**

Paul W. J. J. van der Wielen,\* Geo Bakker, Adrie Atsma, Maarten Lut, Guus Roeselers and Bendert de Graaf

The objective of our study was to explore microbiological parameters that are suitable as indicators for regrowth in distribution systems that receive unchlorinated drinking water in the Netherlands.

693

**A new dipstick colorimetric sensor for detection of arsenate in drinking water**

Joyati Das and Priyabrata Sarkar\*

The first ever dipstick sensing of arsenate through visual observation without any instrumentation.

705

**Emerging investigators series: untangling the microbial ecosystem and kinetics in a nitrogen removing photosynthetic high density bioreactor**

Jacob R. Price, Saeed Keshani Langroodi, Yemin Lan, Jonas M. Becker, Wen K. Shieh, Gail L. Rosen and Christopher M. Sales\*

Metabolic kinetics, microscopy, metagenomic analysis, and real-time PCR are applied to characterize nitrogen species transformation and identify and quantify the organisms key to these transformational processes.

717

**Emerging investigators series: silica-crosslinked graphene oxide membrane and its unique capability in removing neutral organic molecules from water**

Sunxiang Zheng and Baoxia Mi\*

A new graphene oxide (GO) membrane was synthesized by crosslinking GO nanosheets *via* silica. This membrane was found to remove neutral organic molecules much more efficiently than negatively charged ionic species.

726

**Testing methods for new pit latrine designs in rural and peri-urban areas of Malawi where conventional testing is difficult to employ**

R. C. G. Chidya,\* R. H. Holm,\* M. Tembo, B. Cole, P. Workneh and J. Kanyama

There is a trend towards participation of users in the design of appropriate sanitation facilities for low-income countries.

733

**The occurrence of methyl, ethyl, propyl, and butyl parabens in the urban rivers and stormwaters of Sydney, Australia**

Wendy A. Evans, Peter J. Davies\* and Christopher McRae

Solid-phase microextraction and gas chromatography-mass spectrometry (SPME-GC/MS) identified ethyl-paraben in Sydney's urban streams at greater concentrations than other parabens. Results were comparatively higher than studies from cities with combined sewer/stormwater systems.

743

**Gas-permeable hydrophobic membranes enable transport of CO<sub>2</sub> and NH<sub>3</sub> to improve performance of bioelectrochemical systems**

Tom H. J. A. Sleutels,\* Biense J. Hoogland, Philipp Kuntke, Annemiek ter Heijne, Cees J. N. Buisman and Hubertus V. M. Hamelers

Application of a hydrophobic membrane between anolyte and catholyte reduces the internal resistance of bioelectrochemical systems.

749

**On-line monitoring of organic matter concentrations and character in drinking water treatment systems using fluorescence spectroscopy**

Y. Shutova, A. Baker, J. Bridgeman and R. K. Henderson\*

There is a need for a rapid and robust method of organic matter (OM) monitoring during drinking water treatment.

761

**Triclosan adsorption using wastewater biosolids-derived biochar**

Yiran Tong, Brooke K. Mayer and Patrick J. McNamara\*

Wastewater biosolids can be converted to a resource and used to remove micropollutants from wastewater.

**Suitability of Chemcatcher® passive sampling in monitoring organotin compounds at a wastewater treatment plant**

H. Ahkola,\* J. Juntunen, K. Krogerus, T. Huttula, S. Herve and A. Witick

Municipal wastewater contains a number of harmful chemicals whose concentrations can fluctuate dramatically.