

# ES&T's Best Papers of 2017

n a typical day, approximately five new papers are posted to the home page of Environmental Science & Technology (ES&T). The act of posting the paper represents the penultimate step in a journey that a research project made from an initial idea to data collection, interpretation, writing, and peer review. With so many papers passing through this process it would be easy to lose track of the great accomplishments of our authors. To make sure that this does not happen, each year we asked the journal's Editorial Advisory Board to rank approximately 100 papers that our Associate Editors had identified as exceptional contributions. From among the top-ranked papers, I have chosen best papers in the categories of Environmental Science, Environmental Technology, Environmental Policy, and Features. Ranking all of those papers was a tough job, and we are particularly grateful to tireless efforts of Professor Nathalie Tufenkji (McGill University), the chair of the selection committee, and the participating members of the Editorial Advisory Board.

Reading these extraordinary papers, or for that matter, any randomly selected group of papers from the journal, it becomes evident that advances in fields such as medicine, information technology, and materials science fueled by the rapid global economic expansion of the past three decades determine what we study and the way that we study it. In some cases, we have exploited the technological advances of other fields to enhance our ability to detect difficult-to-measure sources of pollution (e.g., by providing us with a means of pinpointing air pollution sources with mobile detectors or by employing a new generation of mass spectrometers capable of identifying unknown compounds in complex matrices). We are also leveraging tools developed in other disciplines to improve our ability to control pollution (e.g., by providing a means of repairing damaged water treatment membranes). Despite the remarkable tools that we have been able to access, we also grapple with the unintended consequences of technological advances, as evidenced by research into impacts on the environment and human health associated with the overuse of antibiotics and indiscriminate disposal of plastic. Our insatiable appetite for technology and economic growth also means that the transition to a sustainable society is going to require much better stewardship of metals, nutrients, and other resources.

With billions of people aspiring for a higher standard of living, and industries capable of providing a dizzying array of technologies to help them achieve it, environmental science and technology research will play a major role in determining the quality of life experienced by future generations. As demonstrated by these award-winning papers and the hundreds of other papers published by ES&T in 2017, our community is capable of leveraging the latest developments from other disciplines to enhance our understanding of the environment and offer effective solutions to pollution problems. It is also evident that we will face a widening array of problems associated with the expanding populations and the growth industries that use new technologies. We are grateful to these exceptional researchers and the thousands of other authors whose efforts have given us the tools to navigate the environmental challenges facing the modern world.

# ENVIRONMENTAL SCIENCE

**Top Paper.** William A. Thompson, Victoria I. Arnold, and Mathilakath M. Vijayan. Venlafaxine in Embryos Stimulates Neurogenesis and Disrupts Larval Behavior in Zebrafish. *Environ. Sci. Technol.*, **2017**, 51 (21), 12889–12897. dx.doi.org/10.1021/acs.est.7b04099

First Runner-Up. Kathrin Reinmuth-Selzle, Christopher J. Kampf, Kurt Lucas, Naama Lang-Yona, Janine Fröhlich-Nowoisky, Manabu Shiraiwa, Pascale S. J. Lakey, Senchao Lai, Fobang Liu, Anna T. Kunert, Kira Ziegler, Fangxia Shen, Rossella Sgarbanti, Bettina Weber, Iris Bellinghausen, Joachim Saloga, Michael G. Weller, Albert Duschl, Detlef Schuppan, and Ulrich Pöschl. Air Pollution and Climate Change Effects on Allergies in the Anthropocene: Abundance, Interaction, and Modification of Allergens and Adjuvants. *Environ. Sci. Technol.*, 2017, 51 (8), 4119–4141. dx.doi.org/10.1021/acs.est.6b04908

**Second Runner-Up.** Kyle Michelson, Robert A. Sanford, Albert J. Valocchi, and Charles J. Werth. Nanowires of *Geobacter sulfurreducens* Require Redox Cofactors to Reduce Metals in Pore Spaces Too Small for Cell Passage. *Environ. Sci. Technol.*, **2017**, 51 (20), 11660–11668. dx.doi.org/10.1021/ acs.est.7b02531

## ENVIRONMENTAL TECHNOLOGY

**Top Paper.** Joshua S. Apte, Kyle P. Messier, Shahzad Gani, Michael Brauer, Thomas W. Kirchstetter, Melissa M. Lunden, Julian D. Marshall, Christopher J. Portier, Roel C.H. Vermeulen, and Steven P. Hamburg. High-Resolution Air Pollution Mapping with Google Street View Cars: Exploiting Big Data. *Environ. Sci. Technol.*, **2017**, 51 (12), 6999–7008. dx.doi.org/10.1021/acs.est.7b00891

First Runner-Up. Sang-Ryoung Kim, Bezawit A. Getachew, and Jae-Hong Kim. In Situ Healing of Compromised Membranes via Polyethylenimine-Functionalized Silica Microparticles. *Environ. Sci. Technol.*, **2017**, 51 (21), 12630–12637. dx.doi.org/10.1021/acs.est.7b03436

**Second Runner-Up.** Huaxi Zhou, Shuwen Yan, Jianzhong Ma, Lushi Lian, and Weihua Song. Development of Novel Chemical Probes for Examining Triplet Natural Organic Matter under Solar Illumination. *Environ. Sci. Technol.*, **2017**, 51 (19), 11066–11074. dx.doi.org/10.1021/acs.est.7b02828

#### ENVIRONMENTAL POLICY

**Top Paper.** Katrin E. Daehn, André Cabrera Serrenho, and Julian M. Allwood. How Will Copper Contamination Constrain Future Global Steel Recycling? *Environ. Sci. Technol.*, **2017**, 51 (11), 6599–6606. dx.doi.org/10.1021/acs.est.7b00997

First Runner-Up. Stephanie L. Wright and Frank J. Kelly. Plastic and Human Health: A Micro Issue? *Environ. Sci.* 

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*Technol.*, **2017**, 51 (12), 6634–6647. dx.doi.org/10.1021/acs.est.7b00423

## **FEATURE**

**Top Paper.** Ilje Pikaar, Silvio Matassa, Korneel Rabaey, Benjamin Leon Bodirsky, Alexander Popp, Mario Herrero, and Willy Verstraete. Microbes and the Next Nitrogen Revolution. *Environ. Sci. Technol.*, **2017**, 51 (13), 7297–7303. dx.doi.org/10.1021/acs.est.7b00916

**First Runner-Up.** Peter J. Vikesland, Amy Pruden, Pedro J. J. Alvarez, Diana Aga, Helmut Bürgmann, Xiang-dong Li, Celia M. Manaia, Indumathi Nambi, Krista Wigginton, Tong Zhang, and Yong-Guan Zhu. Toward a Comprehensive Strategy to Mitigate Dissemination of Environmental Sources of Antibiotic Resistance. *Environ. Sci. Technol.*, **2017**, 51 (22), 13061–13069. dx.doi.org/10.1021/acs.est.7b03623

**Second Runner-Up.** Juliane Hollender, Emma L. Schymanski, Heinz P. Singer, and P. Lee Ferguson. Nontarget Screening with High Resolution Mass Spectrometry in the Environment: Ready to Go? *Environ. Sci. Technol.*, **2017**, 51 (20), 11505–11512. dx.doi.org/10.1021/acs.est.7b02184

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#### Notes

Views expressed in this editorial are those of the author and not necessarily the views of the ACS. The author declares no competing financial interest.