

# Environmental Science: Advances

rsc.li/esadvances

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 2754-7000 CODEN ESANE8 2(5) 677–830 (2023)



### Cover

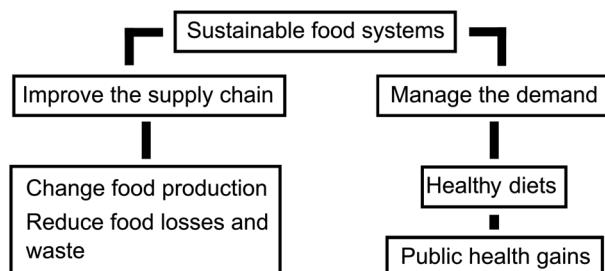
Cover Image credit: © Surasak Suwanmake/Getty Images.

## PERSPECTIVE

684

### Healthy diets for sustainable food systems: a narrative review

Ezequiel M. Arrieta\* and Sebastián Aguiar

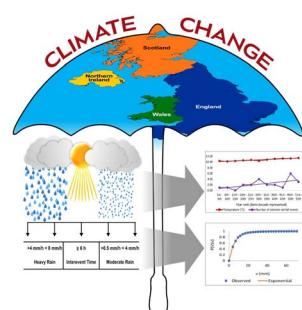


## PAPERS

695

### Extensive rainfall data analysis: event separation from continuous record, fitting of theoretical distributions, and event-based trend detection

Aniek E. Essien,\* Yiping Guo and Sarah E. Dickson-Anderson



# Environmental Science: Advances

rsc.li/esadvances

## Editorial Staff

### Executive Editor

Emma Eley

### Deputy Editor

Jon Ferrier

### Editorial Production Manager

Sarah Whitbread

### Assistant Editors

Aphra Murray, Jamie Purcell, Alexander John, Emily Ellison, Jack Pitchers

### Editorial Assistant

Alex Holiday

### Publishing Assistant

Lee Colwill

### Publisher

Neil Hammond

For queries about submitted papers please contact Sarah Whitbread, Editorial Production Manager in the first instance. E-mail: [esadvances@rsc.org](mailto:esadvances@rsc.org)

For pre-submission queries please contact Emma Eley, Executive Editor. E-mail: [esadvances-rsc@rsc.org](mailto:esadvances-rsc@rsc.org)

Environmental Science: Advances (electronic: ISSN 2754-7000) is published 6 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

Environmental Science: Advances is a Gold Open Access journal and all articles are free to read.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

### Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail [advertising@rsc.org](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

Our existing environmental science journals all have chemistry at their core. *Environmental Science: Advances* will span not only chemistry, but research from any discipline related to the environmental sciences.

We welcome research from any discipline that will contribute to the understanding of the environment, and to the advancement of several UN Sustainable Development Goals – original thinking to take on the world's biggest challenges.

## Editorial Board

### Editor-in-Chief

Zongwei Cai, Hong Kong Baptist University, Hong Kong

Kevin Jones, Lancaster University, UK

Célia M. Manaia, Universidade Católica Portuguesa, Portugal

### Associate Editors

Ru-Jin Huang, Institute of Earth Environment, Chinese Academy of Sciences, China

Liwu Zhang, Fudan University, China

Pernilla Bohlin-Nizzetto, Norwegian Institute for Air Research, Norway

David Weissbrodt, Norwegian University of Science and Technology, Norway

### Members

Silvia Lacorte seult, IDAEA-CSIC, Spain

## Advisory Board

Damià Barceló, Institute of Environmental Assessment and Water Research, Spain

Zhi-Feng Chen, Guangdong University of Technology, China

Jiping Chen, Dalian Institute of Chemical Physics, China

Chuncheng Chen, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

Maofa Ge, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

Tom Harner, Environment and Climate Change Canada, Canada

Rong Ji, Nanjing University, China

Ramanan Laxminarayan, One Health Trust, Washington D.C., United States

Yongjin Li, University of Macau, Taipa, Macao

Hemi Luan, Southern University of Science and Technology, China

Jurgita Ovadneite, National University of Ireland Galway, Ireland

Andreas Schäffer, Institute for Environmental Research, RWTH Aachen University, Germany

Philippe Schmitt-Kopplin, Helmholtz Zentrum München, Germany

Dörthe Tetzlaff, Humboldt University of Berlin and IGB Leibniz Institute of Freshwater Ecology and Inland Fisheries

Mark van Loosdrecht, Technische Universiteit Delft, Netherlands

Meizhen Wang, Zhejiang Gongshang University, China

Zhe Wang, Hong Kong University of Science and Technology, Hong Kong, China

Dengsong Zhang, Shanghai University, China

Xuan Zhang, University of California, Merced, USA

## Information for Authors

Full details on how to submit material for publication in Environmental Science: Advances are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: [rsc.li/esadvances](http://rsc.li/esadvances)

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023.

Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

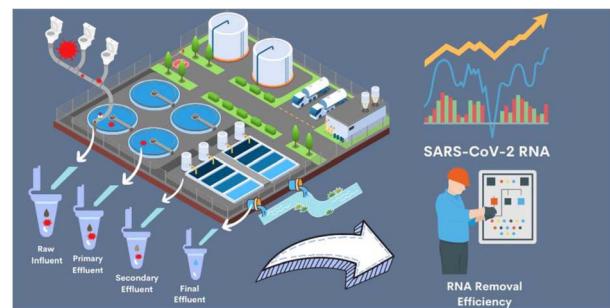


## PAPERS

709

**Wastewater-based surveillance of COVID-19 and removal of SARS-CoV-2 RNA across a major wastewater treatment plant in San Antonio, Texas**

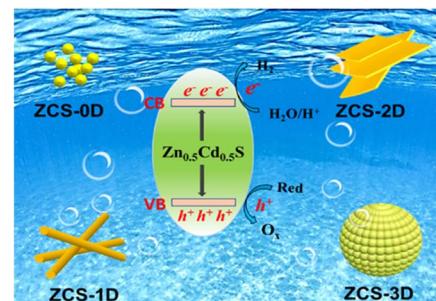
Haya Al-Duroobi, Kiran Kumar Vadde, Duc C. Phan, Sina V. Moghadam, Arash Jafarzadeh, Akanksha Matta, Marcio Giacomoni and Vikram Kapoor\*



721

**Study of the different morphologies of  $Zn_{0.5}Cd_{0.5}S$  for photocatalytic  $H_2$  production**

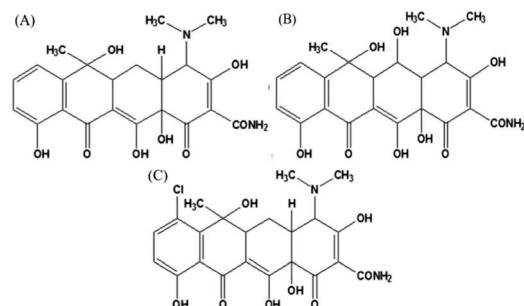
Wei Ren, Ruiru Si, Jiahui Wang, Yang Yang, Xiuzhen Zheng\* and Shifu Chen\*



731

**Magnetic Fe–N–C nanoparticles as a dual nanozyme for label-free colorimetric detection of antibiotics**

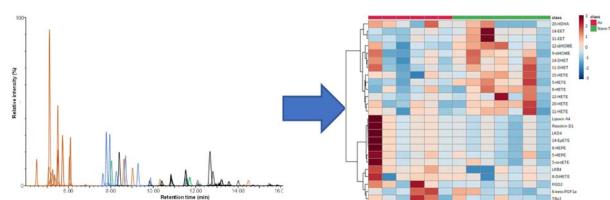
Wen Wen, Yina Liu, Zhongping Li,\* Guangming Wen,\* Hung-Wing Li and Li Li\*



740

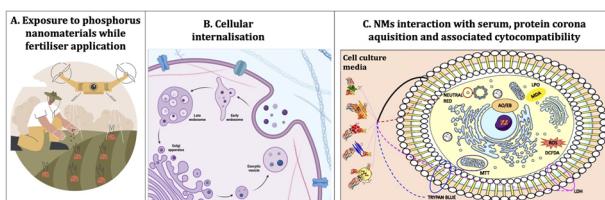
**Distinct profiles of oxylipid mediators in liver, lung, and placenta after maternal nano-TiO<sub>2</sub> nanoparticle inhalation exposure**

Todd R. Harris,\* Julie A. Griffith, Colleen E. C. Clarke, Krista L. Garner, Elizabeth C. Bowbridge, Evan DeVallance, Kevin J. Engles, Thomas P. Batchelor, William T. Goldsmith, Kim Wix, Timothy R. Nurkiewicz and Amy A. Rand



## PAPERS

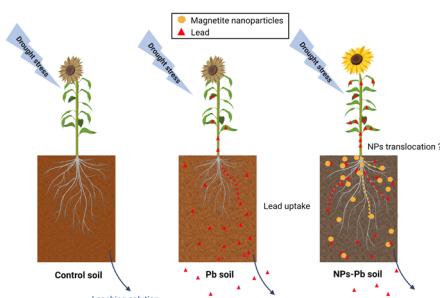
749



## Multi-endpoint assessments for *in vitro* nano-bio interactions and uptake of biogenic phosphorus nanomaterials using HEK293 cells

Ayushi Priyam, Luis O. B. Afonso, Aaron G. Schultz, Amit Kumar Dinda and Pushplata Prasad Singh\*

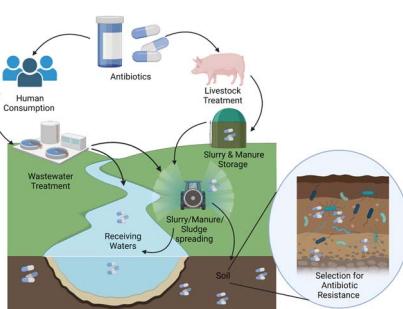
767



## Impact of iron oxide nanoparticles on a lead-polluted water-soil-plant system under alternating periods of water stress

Léa Mounier, Mathieu Pédro, Martine Bouhnik-Le-Coz and Francisco Cabello-Hurtado\*

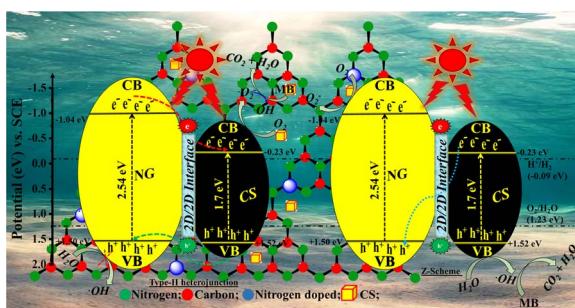
780



## A framework to assess the terrestrial risk of antibiotic resistance from antibiotics in slurry or manure amended soils

Felicity C. T. Elder,\* Alex J. O'Neill, Lisa M. Collins and Laura J. Carter

795



## 2D/2D nitrogen-doped graphitic carbon nitride/cobalt sulfide nanostructures for fast photodegradation of methylene blue dye and real industrial sewage effluents

Sai Bhargava Vuggili, Umesh Kumar Gaur, Tushar Tyagi and Manu Sharma\*

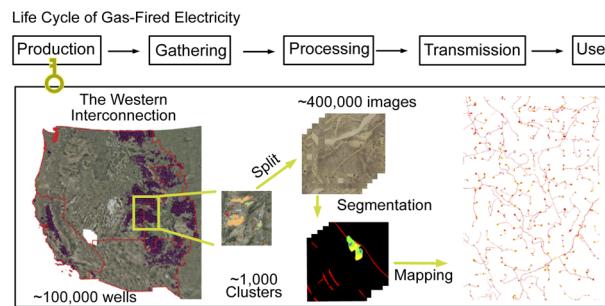


## PAPERS

815

**The life cycle land use of natural gas-fired electricity in the US Western interconnection**

Tao Dai, Jeya Maria Jose Valanarasu, Vishal M. Patel and Sarah M. Jordaan\*



## CORRECTION

827

**Correction: The reuse of electronic components from waste printed circuit boards: a critical review**

Wenting Zhao, Junqing Xu, Wenlei Fei, Ziang Liu, Wenzhi He and Guangming Li\*

