

Environmental Science Water Research & Technology

rsc.li/es-water

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 2053-1400 CODEN ESWRAR 9(8) 1973–2162 (2023)



Cover

See Farshid Ghanbari, Kun-Yi Andrew Lin et al., pp. 1992–2007.
Image reproduced by permission of Lin et al. from *Environ. Sci.: Water Res. Technol.*, 2023, 9, 1992.



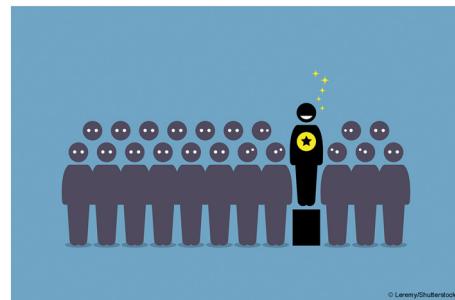
Inside cover

See Maricor J. Arlos et al., pp. 2008–2020.
Image reproduced by permission of Maricor J. Arlos and Kaitlin Pylypa from *Environ. Sci.: Water Res. Technol.*, 2023, 9, 2008.

EDITORIAL

1981

Outstanding Reviewers for *Environmental Science: Water Research & Technology* in 2022

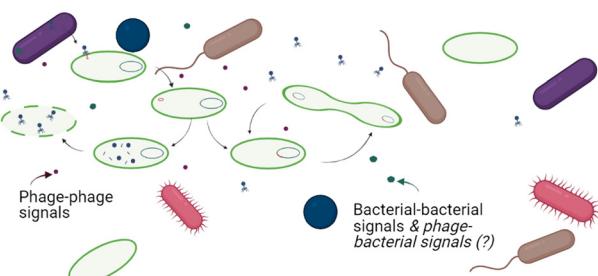


FRT

1982

Emerging investigator series: the role of phage lifestyle in wastewater microbial community structures and functions: insights into diverse microbial environments

Jeseth Delgado Vela* and Mitham Al-Faliti



Environmental Science Water Research & Technology

rsc.li/es-water

Environmental Science: Water Research & Technology seeks to showcase high quality research about fundamental science, innovative technologies, and management practices that promote sustainable water.

Editorial Board

Editor-in-Chief

Graham Gagnon, Dalhousie University, Canada

Members

Takahiro Fujioka, Nagasaki University, Japan
Xia Huang, Tsinghua University, China
Karin Jönsson, Lund University, Sweden
Branko Kerkez, University of Michigan, USA
Jeonghwan Kim, Inha University, South Korea
Linda Lawton, Robert Gordon University, UK
Luca Vezzaro, Technical University of Denmark, Denmark
Eveline Volcke, Ghent University, Belgium

Associate Editors

Sebastià Puig Broch, Universitat de Girona, Spain
Wenhai Chu, Tongji University, China
Lauren Stadler, Rice University, USA
Liu Ye, The University of Queensland, Australia

Advisory Board

Nicholas Ashbolt, University of Alberta, Canada
Federico Aulenta, National Research Council, Italy
Tom Bond, University of Surrey, UK
Joby Boxall, The University of Sheffield, UK
Kartik Chandran, Columbia University in the City of New York, USA
Amy Childress, University of Southern California, USA
David M. Cwiertny, University of Iowa, USA
Dionysios Dionysiou, University of Cincinnati, USA
Joel Ducoste, North Carolina State University, USA
Jingyun Fang, Sun Yat-Sen University, China
Maria José Farré, Catalan Institute for Water Research, Spain
Yujie Feng, Harbin Institute of Technology, China
Kathrin Fenner, Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland
Ramesh Goel, University of Utah, USA
Ola Gomaa, National Center for Radiation Research and Technology, Egypt
Chris Gordon, University of Ghana, Ghana
April Gu, Cornell University, USA
Jochen Hack, Leibniz Universität Hannover, Germany
Zhen "Jason" He, Washington University in St. Louis, USA

Cynthia Joll, Curtin University, Australia
Tamar Kohn, École Polytechnique Fédérale de Lausanne, Switzerland
Tove Larsen, Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland
Peng Liang, Tsinghua University, China
Irene Lo, Hong Kong University of Science and Technology, Hong Kong, China
Julie Minton, The Water Research Foundation, USA
Vincenzo Naddeo, University of Salerno, Italy
Indumathi M Nambi, Indian Institute of Technology Madras, India
Long Nghiem, University of Technology Sydney, Australia
Paige Novak, University of Minnesota, USA
Yong Sik Ok, Korea University, South Korea
Ligy Philip, IIT Madras, India
Thalappil Pradeep, Indian Institute of Technology Madras, India
Zhiyong "Jason" Ren, Princeton University, USA
Peter Robertson, Queen's University Belfast, UK
Michael Templeton, Imperial College London, UK
Kai Uder, Swiss Federal Institute of Aquatic Science and Technology, Switzerland
Subramanyan Vasudevan, CSIR-Central Electrochemical Research Institute, Karaikudi, India
Luca Vezzaro, Technical University Denmark,

Denmark
Aijie Wang, Research Center for Eco-Environmental Sciences, China
Xin Wang, Nankai University, China
David Weissbrodt, TU Delft, The Netherlands
Krista Wigginton, University of Michigan, USA
Di Wu, Ghent University, South Korea
Defeng Xing, Harbin Institute of Technology, China
Jeyong Yoon, Seoul National University, South Korea

Information for Authors

Full details on how to submit material for publication in *Environmental Science: Water Research & Technology* 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/es-water

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

Editorial Staff

Executive Editor

Neil Scriven

Deputy Editor

Grace Thoburn

Development Editor

Nour Tanbouza

Editorial Production Manager

Claire Darby

Publishing Editors

Emma Carlisle, Hannah Hamilton, Ephraim Otumudia, Irene Sanchez Molina Santos, Michael Spencelayah, Callum Woof, Lauren Yarrow-Wright

Editorial Assistant

Kate Bandoo

Publishing Assistant

Linda Warneke

Publisher

Sam Keltie

For queries about submitted papers please contact Claire Darby, Editorial Production Manager, in the first instance. E-mail: eswater@rsc.org

For pre-submission queries please contact Neil Scriven, Executive Editor. E-mail: eswater-rsc@rsc.org

Environmental Science: Water Research & Technology (electronic: ISSN 2053-1419) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK
Tel +44 (0)1223 432398; E-mail orders@rsc.org

2023 Annual (electronic) subscription price: £1881; US\$3103. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

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

For marketing opportunities relating to this journal, contact marketing@rsc.org

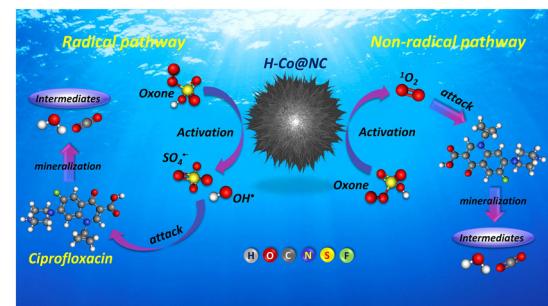


PAPERS

1992

Emerging investigator series: enhancing the degradation of ciprofloxacin in water using Oxone activated by urchin-like cubic and hollow-structured cobalt@N-doped carbon prepared by etching-engineering: a comparative study with mechanistic and eco-toxic assessments

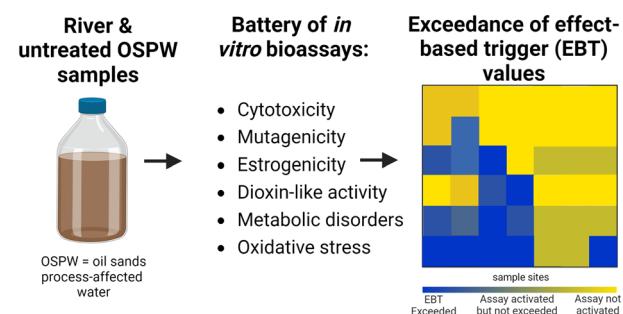
Duong Dinh Tuan, Young-Kwon Park, Jet-Chau Wen, Ha Manh Bui, Xiaoguang Duan, Farshid Ghanbari,* Suresh Ghotekar, Wei-Hsin Chen and Kun-Yi Andrew Lin*



2008

Water quality monitoring with *in vitro* bioassays to compare untreated oil sands process-affected water with unimpacted rivers

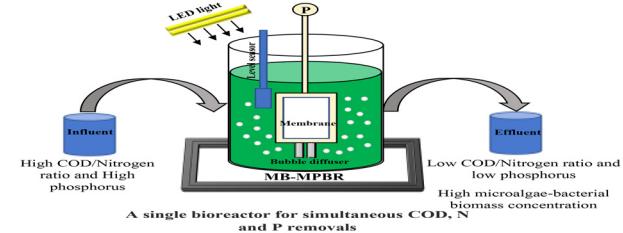
Kia Barrow, Beate I. Escher, Keegan A. Hicks, Maria König, Rita Schlichting and Maricor J. Arlos*



2021

Effect of the organic carbon to nutrient (N and P) ratio on the biological performance of a microalgal-bacterial membrane photobioreactor

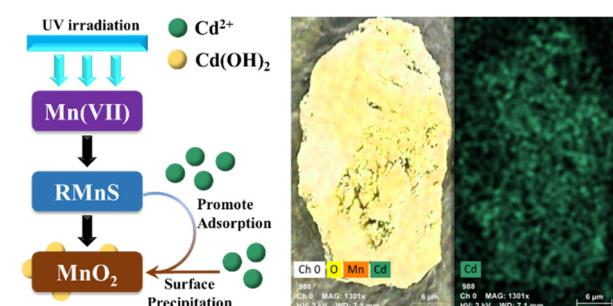
Hana Lafi, Umed Panu and Baoqiang Liao*

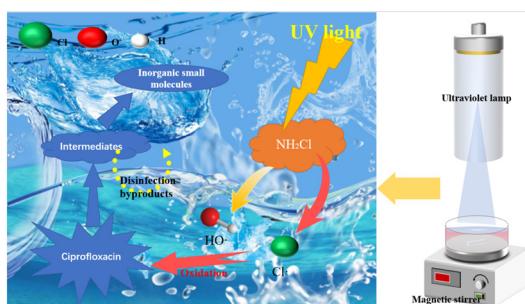


2031

The removal of Cd(II) by the UV/permanganate process: role of continuously *in situ* formed MnO₂ and reactive species

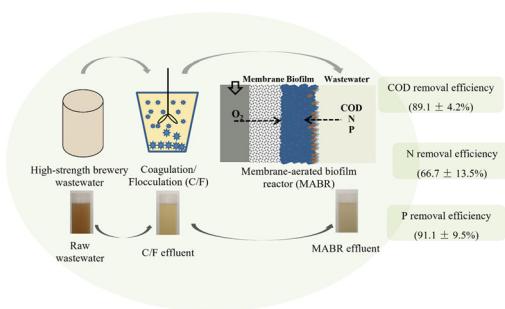
Wenrui Wei, Xinwen Kang, Sining Wu, Virender K. Sharma, Ruijie Xie, Beicheng Xia, Kaiheng Guo* and Jingyun Fang





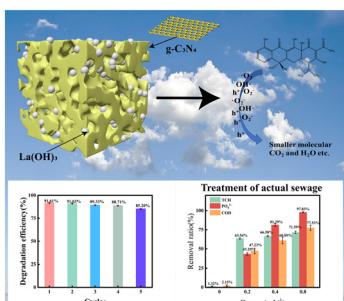
The degradation of ciprofloxacin in the UV/NH₂Cl process: kinetics, mechanism, pathways and DBP formation

Ruihua Zhang, Cheng Peng, Qiongfang Wang,* Xinyu Zou, Qiming Zhao, Jiajun Wang, Jiayu Zhang, Lei Dong, Xin Zhang and Naiyun Gao



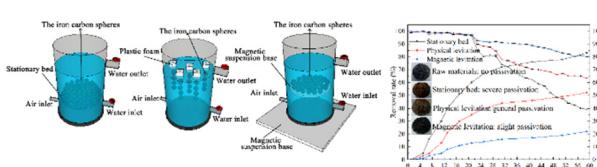
Evaluating the performance of an integrated membrane-aerated biofilm reactor (MABR) system for high-strength brewery wastewater treatment

Hailong Tian, Jisheng Zhang, Yifei Zheng, Guipeng Zheng, Yuanyuan Li, Yingchun Yan, Zhiwen Li* and Ming Hui*



Visible-light driven tetracycline hydrochloride degradation by nano-lanthanum hydroxide modified carbon nitride: performance, mechanism, and application in real wastewater treatment

Jian Xiong,* Hanghang Xu, Xuejie Yin, Bei Yang, Evangelos Petropoulos, Lihong Xue, Linzhang Yang and Shiying He*



Construction of a novel magnetic levitation iron-carbon micro-electrolysis treatment system for dye wastewater and its anti-passivation strategy

Zhihao Chen, Minquan Feng,* Yibo Wang,* Qi Ma and Qian Yin

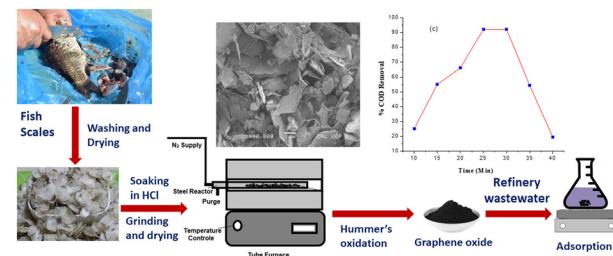


PAPERS

2089

Batch mode and continuous flow adsorption of hydrocarbon pollutants from refinery wastewater using graphene oxide derived from fish scales

Waqas Ahmad, Sajid Ullah, Imtiaz Ahmad, Taj Muhammad, Yu Shuang Ren and Muhammad Ilyas*



2099

Enhanced remediation of As(III) and As(V) by new zirconium-loaded attapulgite and its mechanisms in the aquatic environment

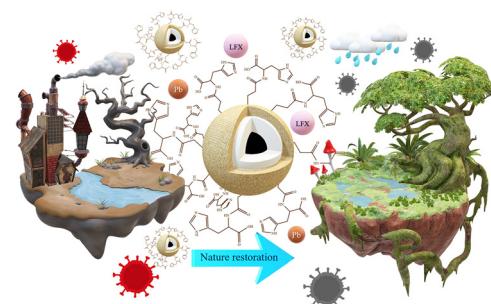
Jinhui Wang, Qin Sun,* Qi Gao and Xinyu Sun



2112

A magnetic nano-sorbent incorporating antimicrobial papain for the rapid and efficient removal of levofloxacin and Pb(II) from aqueous systems

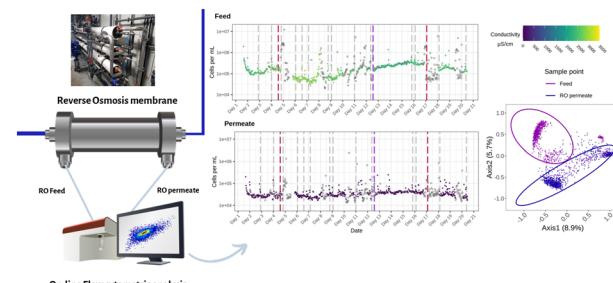
Mahdi Akhgari, Elias Mosaffa, Haniyeh Dogari, Nasim Amiri Ramsheh, Hossein Ghafuri* and Atanu Banerjee



2128

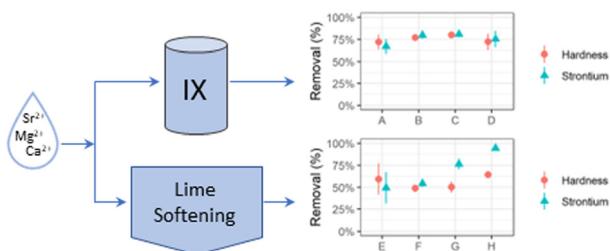
Flow cytometry for on-line microbial regrowth monitoring in a membrane filtration plant: pilot-scale case study for wastewater reuse

Thomas Pluym, Cristina García-Timermans, Sander Vervloet, Riet Cornelissen, Nico Boon and Bart De Gusseme*



PAPERS

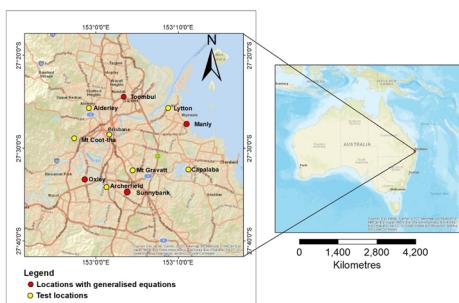
2140



Removal of strontium by ion exchange and lime softening at eight drinking water treatment plants

Darren A. Lytle,* Asher E. Keithley, Daniel Williams and Hannah Chait

2152



Spatial sensitivity of generalised equations to predict rainwater tank outcomes: a case study for Brisbane

Mohammad Saarim Khan and Monzur Alam Imteaz*

