Research landscape of Transmission dynamics of AMR

Ravikrishnan Elangovan,
Department of Biochemical Engg and Biotechnology,
Indian Institute of Technology – Delhi
Matthew D. Surette and Gerard D. Wright
Antimicrobial resistance in selected environments in Norway, M-736, 2017

Antibiotic exposure and selection for resistance in bacterial communities

Figure 1: A representation of the intersections between human activity and environmental compartments in terms of the spread of AB, ARB and antimicrobial resistance determinants (ARD) (ill. By Cathrine Brynjulfson, GenØk. All icons are designed by designers at Freepik.com: Macrovector, Ibrandify, Zirconicusso)
Short Communication

Detection and molecular typing of methicillin-resistant *Staphylococcus aureus* from northeastern part of India

Deepshikha Bhowmik, Shiela Chetri, Deepjyoti Paul, Debadatta Dhar Chanda, Amitabha Bhattacharjee

Comparative Prevalence of Antimicrobial Resistance in Community-Acquired Urinary Tract Infection Cases from Representative States of Northern and Southern India

The First Report of Phenotypic and Molecular Characterization of Extended-Spectrum Beta-Lactamase-Producing Uropathogens in Sikkim and Darjeeling Hills of India

Varsha Rani Gajamer, Amitabha Bhattacharjee, Deepjyoti Paul, Jyotsna Kapil, Arunabha Sarkar, Ashish Kr Singh, Nilu Pradhan, and Hare Krishna Tiwari
Increased Waterborne $bla_{NDM-1}$ Resistance Gene Abundances Associated with Seasonal Human Pilgrimages to the Upper Ganges River

Z. S. Ahammad, †, ‡ T. R. Sreekrishnan, † C. L. Hands, † C. W. Knapp, ‡ and D. W. Graham** †

†School of Civil Engineering & Geosciences, Newcastle University, Newcastle upon Tyne, United Kingdom
‡Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India
*Department of Civil and Environmental Engineering, University of Strathclyde, Glasgow, United Kingdom

ABSTRACT: Antibiotic resistance (AR) is often rooted in inappropriate antibiotic use, but poor water quality and inadequate sanitation exacerbate the problem, especially in emerging countries. An example is increasing multi-AR due to mobilizable plasmid-borne genes since 1977. The impact on human health is unknown.

Shotgun metagenomics reveals a wide array of antibiotic resistance genes and mobile elements in a polluted lake in India

Johan Bengtsson-Palme 1, Fredrik Boulund 2, Jerker Fick 3, Erik Kristiansson 3 and D. G. Joakim Larsson 1*

1 Department of Infectious Diseases, Institute of Biomedicine, The Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden
2 Department of Mathematical Sciences, Chalmers University of Technology and University of Gothenburg, Gothenburg, Sweden
3 Department of Chemistry, Umeå University, Umeå, Sweden

Antibiotic Resistance Characterization of Environmental E. coli Isolated from River Mula-Mutha, Pune District, India

Rutuja Dhawde 1, Ragini Macaden 2, Dhananjaya Saranath 3, Kayzad Nilgiriwala 1, Appasaheb Ghadge 4 and Tannaz Birdi 1,*

16-06-2019
Impact of wastewater from different sources on the prevalence of antimicrobial-resistant *Escherichia coli* in sewage treatment plants in South India

Masato Akiba\textsuperscript{a,b,*}, Hironobu Senba\textsuperscript{c}, Haruna Otagiri\textsuperscript{d}, Valipparambil P. Prabhasankar\textsuperscript{e}, Sachi Tanivasu\textsuperscript{f}, Nohuyoshi Yamashita\textsuperscript{f}, Ken-ichi Lee\textsuperscript{a}, Takehisa Yamamoto\textsuperscript{g}

Occurrence and fate of pharmaceuticals in WWTPs in India and comparison with a similar study in the United States

Sanjeeb Mohapatra\textsuperscript{a}, Ching-Hua Huang\textsuperscript{b}, Suparna Mukherji\textsuperscript{a, **}, Lokesh P. Padhye\textsuperscript{a, b, c, *}

\textsuperscript{a} Centre for Environmental Science and Engineering, IIT Bombay, Mumbai, Maharashtra, India
\textsuperscript{b} School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA, 30332, USA
\textsuperscript{c} Department of Civil and Environmental Engineering, The University of Auckland, Auckland, New Zealand

Occurrences and fate of selected human antibiotics in influents and effluents of sewage treatment plant and effluent-receiving river Yamuna in Delhi (India)

Pravin K. Mutiyar • Atul K. Mittal

Received: 2 January 2013 / Accepted: 23 August
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Hospital Wastewater Releases of Carbapenem-Resistance Pathogens and Genes in Urban India

Manisha Lamba,\textsuperscript{†} David W. Graham,\textsuperscript{¶} and S. Z. Ahammad\textsuperscript{*,†}

\textsuperscript{†}Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India
\textsuperscript{¶}School of Civil Engineering & Geosciences, Newcastle University, Newcastle upon Tyne, NE1 7RU, United Kingdom
A Treatment Plant Receiving Waste Water from Multiple Bulk Drug Manufacturers Is a Reservoir for Highly Multi-Drug Resistant Integron-Bearing Bacteria

Nachiket P. Marathe¹, Viduthalai R. Regina¹,³, Sandeep A. Walujkar¹, Shakti Singh Charan¹, Edward R. B. Moore²,³, D. G. Joakim Larsson³, Yogesh S. Shouche¹*

¹ Microbial Culture Collection (MCC), National Center for Cell Science, Pune, Maharashtra, India, ² Culture Collection University of Gothenburg (CCUG), Gothenburg, Sweden, ³ Department of Infectious Diseases, Institute of Biomedicine, The Sahlgrenska Academy at the University of Gothenburg, Gothenburg, Sweden
CONTAMINATION OF SURFACE, GROUND, AND DRINKING WATER FROM PHARMACEUTICAL PRODUCTION

Jerker Fick,*† Hanna Söderström,† Richard H. Lindberg,† Chau Phan,† Mats Tysklind,† and D.G. Joakim Larsson‡

†Department of Chemistry, Umeå University, Linneausväg 6, SE-90187 Umeå, Sweden
‡Department of Neuroscience and Physiology, Sahlgrenska Academy at the University of Gothenburg,

Environmental pollution with antimicrobial agents from bulk drug manufacturing industries in Hyderabad, South India, is associated with dissemination of extended-spectrum beta-lactamase and carbapenemase-producing pathogens

Christoph Lübbert¹,² · Christian Baars³ · Anil Dayakar⁴ · Norman Lippmann²,⁵ · Arne C. Rodloff²,⁵ · Martina Kinzig⁶ · Fritz Sörgel⁶,⁷

Received: 27 February 2017 / Accepted: 8 March 2017 / Published online: 26 April 2017
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CODEN: JDDTB (Source: American Chemical Society)
Volume 3, Issue 31, August, 2015, 62-68

"India's progress towards Ecopharmacovigilance"

Dr Niroop Revannasiddaiah, Dr Chandani Ashok Kumar
MBBS, M.D.
Assistant professor, Pharmacology
Received 10 August 2015; Accepted 23 August 2015
Why/How?

Spatial, temporal variation?
Contributions of geography, temperature, social/economical factors

So what?

Risk assessment: Surveillance and awareness
Technology: Scalable & Affordable solutions

Domestic Sewage Waste Water Treatment by using Electro-Coagulation Process

Amar Pratap Singh
M.Tech. Scholar, Department of Chemical Engineering, Mewar University, Gangaur, Chittorgarh, 312 901 (Rajasthan) India,

Dr. Amit Singh Thakur
Assistant Professor, Department of Chemistry, ISLE, IPS Academy, Indore, 452012 (M.P.), India
Trends in Microbiology

Opinion

Bacteriophages as Environmental Reservoirs of Antibiotic Resistance

William Calero-Cáceres, ¹ Mao Ye, ² and José Luis Balcázar ³, *

Anthropogenic pollution
- Sewage
- Sludge
- Manure
- Agricultural wastewater

Chromosome
Prophage
Plasmid

High rates of antibiotic-resistant bacteria

Environmental stress or spontaneous induction

Random host DNA packaging

Phages (non-ARG carrier)
Phage (ARG carrier)

Phage-like particles
GTA (host DNA carrier)
GTA (ARG carrier)
Antibiotic resistance in European wastewater treatment plants mirrors the pattern of clinical antibiotic resistance prevalence


Article
Antibiotic Resistance in an Indian Rural Community: A ‘One-Health’ Observational Study on Commensal Coliform from Humans, Animals, and Water
Manju Raj Purohit, Salesh Chandran, Harshada Shah, Vishal Diwan, Ashok J. Tamhankar, Cecilia Stålsby Lundborg
A rationale for the high limits of quantification of antibiotic resistance genes in soil☆

Gianuario Fortunato a, Ivone Vaz-Moreira a, b, Cristina Becerra-Castro a, b, 1, Olga C. Nunes b, Célia M. Manaia a, *

a Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina — Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquitecto Lobão Vital, 172, 4200-374, Porto, Portugal
b LEPAE, Laboratório de Engenharia de Processos, Ambiente, Biotecnologia e Energia, Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465, Porto, Portugal

Global monitoring of antimicrobial resistance based on metagenomics analyses of urban sewage
Treating wastewater from a pharmaceutical formulation facility by biological process and ozone

Yaal Lester\textsuperscript{a,b}, Hadas Mamane\textsuperscript{a}, Ines Zucker\textsuperscript{a,b}, Dror Avisar\textsuperscript{b,*}

\textsuperscript{a} School of Mechanical Engineering, Faculty of Engineering, Tel Aviv University, Tel Aviv 69978, Israel
\textsuperscript{b} The Hydro-Chemistry Laboratory, Geography and the Environment, Tel Aviv University, Tel Aviv 69978, Israel

Antimicrobial resistance (AMR) and plant-derived antimicrobials (PDA\textsubscript{m}s) as an alternative drug line to control infections

Jatin Srivastava · Harish Chandra · Anant R. Nautiyal · Swinder J. S. Kalra
Thank you