Session B Frontiers in applied and aquatic microbiology

Prof. Joan Rose / From Polio to COVID: environmental virology at its best

Since the era of waterborne jaundice and polio, diseases spread by viruses were present prior to our understanding of these unique biological entities. Environmental virology attempts to understand the disease risk through the monitoring of viruses in wastewater, fresh and marine waters. The advent of molecular tools and high throughput sequencing technologies coupled with metagenomics has offered the opportunity to identify human viral pathogens including global spread of diseases such COVID-19. We now have the ability to monitor community health via the surveillance of our wastewater thus addressing global grand challenges including the implementation of world-wide vaccination programs.

Prof. Lisa, Alvarez Cohen / Biology of emerging contaminants, do they *really* eventually emerge?

Societal demand for new products promotes the production and release of new chemicals. Additionally, population growth and climate change have produced increased demand on water resources, resulting in greater reliance on direct and indirect water reuse. Advances in analytical chemistry enables us to detect environmental contaminants with increasing sensitivity, allowing us to discover new families of emerging contaminants that threaten our water resources. Understanding the biotransformation potential of emerging contaminants has been a challenge that' s been greatly assisted by means of molecular tools. This talk will describe lessons-learned and research aimed at discovering the biodegradation potential and pathways for a variety of important "emerging contaminants" , including MTBE, I,4-dioxane, NDMA, PBDEs and PFASs in aqueous film forming foams (AFFF).

Prof. Damia Barcelo / Macro- and micro-plastic litter and increased COVID-19 based plastic pollution in the aquatic environment and landfills: treatment, environmental risks and policy solutions

This presentation will cover in the first part different aspects of MPs and Macro-Plastic litter pollution in coastal waters , rivers ,sediments and lakes . Case studies of MP pollution in several coastal environments, sediments and catchments of China,. Saudi Arabia, India, Europe and Australia will be reported. It is well-known that microplastics affect communities, biological diversity, and ecosystem processes will be reported. In its second half I will discuss as well plastic litter and its increased use under Covid-19 outbreak. In this sense the excessive use and consumption of single-use plastics (including personal protective equipment such as masks and gloves) due to COVID-19 pandemic. This talk aims to provide an integrative and synthesized overview on the effects of COVID-19 on macroplastic pollution and its potential implications on the environment and human health in a long-term scenario; addressing the main challenges and discussing potential strategies to potentially overcome them. It emphasizes that future measures, involved in emergent health crisis or not, should reflect the balance between public health and environmental safety as they are both undoubtedly connected. Recommendations on the management side will be made like (i) law and waste management strategies, such as exploring new removal technologies and avoid landfilling if this is economically feasible (ii) education, outreach and awareness, (iii) source identification, (iv)increasing monitoring and risk assessment to better understand the threat to biodiversity by reporting additional case studies where showing the impact of MP around the globe and (v) further innovative research lines like the development of bioplastics to replace SUPs in our daily life.