Research Unit
Environmental Engineering and Biotechnology

Lecture

Dr. Frank Schreiber

Federal Institute for Materials Research and Testing (BAM), Berlin, Germany

Wednesday, 27 November 2019, 14:00
Leipziger KUBUS, Lecture Hall 1D
Permoserstr. 15, 04318 Leipzig

Antimicrobial resistance: the interplay of biocides and antibiotics affecting resistance evolution in bacteria

Biocides are important to ensure hygiene in sensitive settings like hospitals and to protect materials used in industry and buildings. Therefore, in many applications biocides are used near to humans and the microbiomes of human-inhabited environments are exposed to biocides. An important issue related to the use of biocides is that bacteria can evolve resistance to biocides and that the evolved mechanisms can confer cross-resistance to antibiotics. In this presentation, I will discuss the evolutionary mechanisms that affect resistance evolution by the interplay of biocides and antibiotics. Furthermore, I will highlight examples of our current work on biocide resistance evolution with an emphasis on 3 aspects: (i) effects of biocides on basic evolutionary drivers for resistance including mutation rates and horizontal gene transfer, (ii) evolution of persistence to biocides as a survival strategy on the single-cell level, (iii) synergy and antagonism induced by biocide-antibiotic combinations.

Dr. Schreiber is leading a research group within the Division of Biodeterioration and Reference Organisms at the Federal Institute for Materials Research and Testing (BAM). His group works on the evolution of antimicrobial resistance towards biocides used to disinfect and protect surfaces and associated cross-resistance to antibiotics. The team combines approaches from experimental evolution, microbial ecology, molecular microbiology and single-cell microbiology including time-lapse microscopy, microfluidics and advanced imaging. Dr. Frank Schreiber studied biotechnology in Berlin and marine microbiology in Bremen. He performed his PhD with Dirk de Beer, Bo Barker Jørgensen and Marcel Kuypers at the MPI for Marine Microbiology in Bremen on the eco-physiology of nitric oxide in N-cycling environments. He then did postdoctoral work as a Marie Curie fellow in the lab of Prof. Martin Ackermann at ETH Zurich and Eawag on environmental drivers of phenotypic heterogeneity.

All interested colleagues are kindly invited.