

## IOW Press Release of April 9, 2014

### **Piggyback pathogens? The new Leibniz network MikrOMIK is dedicated to studying the potential danger of marine microplastics**

*Are marine microplastics the ideal medium for spreading germs, for example Vibrio? A comprehensive 12-institute consortium led by the Warnemünde environmental microbiologist Matthias Labrenz will pursue this question over the next three years.*

Day in, day out, countless plastic microparticles are swept into the sea. Their small size of less than 5 mm prevents their retention by water treatment plants. And their sources are becoming ever more numerous. A single fleece pullover in the washing machine releases thousands of microfibers that easily evade the lint trap. They are as blithely prevalent in toothpastes and peeling products as in cleaning and polishing agents. A modern household without microplastics is, today, nearly unimaginable. Thus plastic, which primarily ends up in the environment as tiny particles, is only one side of the microplastics story. Rather, there are also secondary microplastics, such as pulverized plastic bottles, plastic bags, and nylon nets, i.e., plastic waste that cannot be recycled.

These microparticles can be taken up by organisms, such as those that have become specialized in filtering their nutrients out of the water. Because plastic is poorly degradable, these particles pass virtually unchanged through the organism's digestive tract and are usually excreted. Along the way, however, pathogenic microbes can adhere to them and then proliferate. That plastic generally offers a favorable surface for certain pathogens has already been shown. Presumably, a similar role is played by microplastics, as transfer sites in the digestive tract, but this has yet to be confirmed. If this hypothesis turns out to be true, then the ubiquity and easy spread of microplastics poses a high hazard potential.

For Matthias Labrenz the results of this project are therefore of great societal interest. "Today, we know much too little to be able to talk about a genuine danger. But there are scenarios that emerge from risks that are serious enough to demand clarity."



In MikrOMIK, a network of microbiologists, benthologists, infectious disease biologists, biogeochemists, and modelers are working together on the proof of this hypothesis. Experts from the leading German centers belong to the consortium. Institutes from the UK and Denmark extend the expertise beyond Germany's borders.

The network has set itself three major goals: 1. Its members want to first determine the distribution of microplastics in the Baltic Sea as well as the areas from which they are emitted and where they accumulate, since thus far robust data are sorely missing. 2. The typical microbial communities of biofilms formed on microparticles will be examined and their characteristics and functions identified. The third and overall goal of the project is to answer the question, what potential health risks do pathogen-inhabited microparticles pose for the Baltic Sea States.

The project is funded by the so-called "Pact for Research and Innovation." It makes available funds that Leibniz Association members can use for competitive projects. The sponsorship is in the amount of 1.35 million Euros for three years.

#### The MikrOMIK network

Leibniz-Institut für Ostseeforschung Warnemünde (IOW) / PD. Dr. Matthias Labrenz (Project leader, Environmental Microbiology), PD Dr. Joanna Waniek (Biogeochemistry), PD Dr. Gerald Schernewski (Applied Coastal Research and Coastal Zone Management), Prof. Dr. Hans Burchard (Physical Oceanography and Measurement Techniques), Dr. Sonja Oberbeckmann (Coordinator, Environmental Microbiology)

Leibniz-Institut für Polymerforschung Dresden (IPF) / Dr. Klaus-Jochen Eichhorn (Analysis)

Leibniz-Institut für Gewässerökologie und Binnenfischerei (IGB) / Prof. Dr. Hans-Peter Grossart (Aquatic Microbial Ecology)

Leibniz-Institut DSMZ – Deutsche Sammlung für Mikroorganismen und Zellkulturen (DSMZ) / Prof. Dr. Jörg Overmann (Director)

Leibniz-Institut für Naturstoff-Forschung und Infektionsbiologie, Hans-Knöll-Institut (HKI) / Prof. Dr. Axel A. Brakhage (Director)

Universität Aarhus, Dänemark / Dr. Jakob Strand (Marine Ecology)

Universität Bayreuth / Prof. Dr. Christian Laforsch (Animal Ecology)

Universität Greifswald / Prof. Dr. Thomas Schweder (Marine Biotechnology)

Universität Lincoln, Großbritannien / Prof. Dr. Mark Osborn (Biotechnology)

Universität Oldenburg / Dr. Barbara Scholz-Böttcher (Organic Analysis)

Universität Rostock / PD Dr. Stefan Forster (Marine Biology)

Alfred-Wegener-Institut für Polar- und Meeresforschung Bremerhaven / Dr. Gunnar Gerdt (Microbial Ecology)

**Contact:**

PD Dr. Matthias Labrenz, Department Biological Oceanography, IOW  
(Tel.: +49 (381) / 5197 387, E-mail: matthias.labrenz@io-  
warnemuende.de)

Dr. Barbara Hentzsch, Press Relations, IOW  
(Tel.: +49 (381) / 5197 102, Email: barbara.hentzsch@io-  
warnemuende.de)

Nils Ehrenberg, Press Relations, IOW  
(Tel.: +49 (381) / 5197 106, Email: nils.ehrenberg@io-  
warnemuende.de)

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