

Offer for a doctoral thesis in the Faculty of Medicine (May 9, 2022)

How does the human body deal with ingested micro- and nanoplastics?

Contamination of the environment with micro- and nanoplastic particles (MNPs) and their presumed harmful effects on organisms, ecosystems and human health are gaining increasing scientific and public attention. Various studies show that MNPs are present in almost all environments, leading to a high probability of human exposure to MNPs. Different exposure scenarios can occur. The main routes of exposure of MNPs to the human body are via the respiratory tract and the gastrointestinal tract (GIT) through inhalation or ingestion, but also via the skin through the use of personal care products (PCPs) containing MNPs (Fig. 1). Once MNPs have entered the human body, it is possible that they are translocated from the exposed tissue to other body compartments.

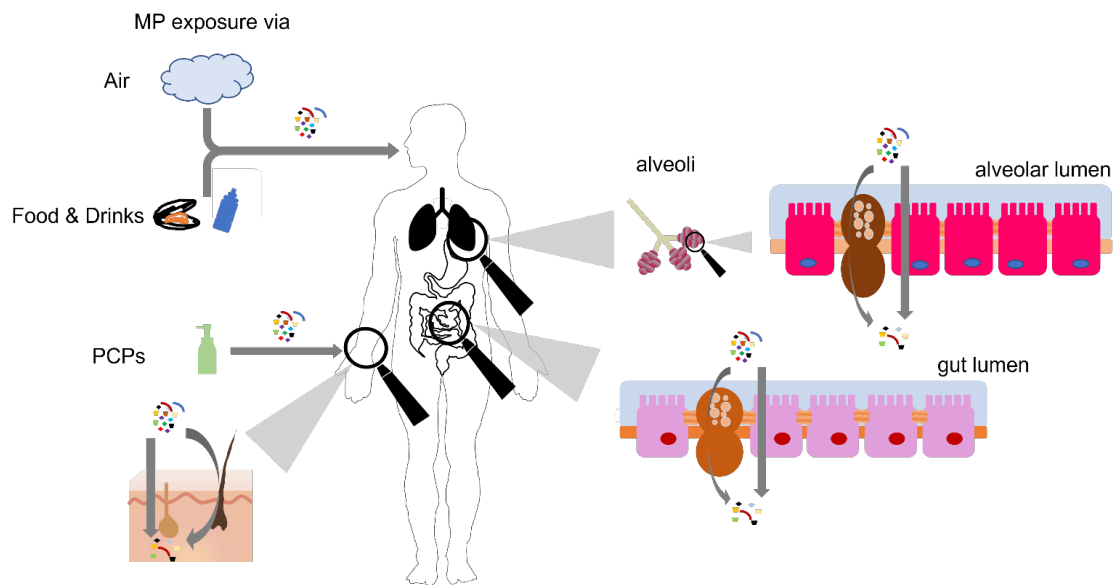


Fig. 1 Taken from Ramsperger et al. 2022

How MNPs are absorbed into the human body and what happens to them there has been little researched so far. In the planned project, it is planned to isolate human macrophages (phagocytes) from human blood and feed them with MNPs. The following questions will then be answered: (1) How quickly do the macrophages take up the MNPs? (2) What do the MNPs in the macrophages look like morphologically? (3) How do the macrophages react to the uptake of MNPs? Do they tend to release pro-inflammatory or anti-inflammatory cytokines after uptake? These studies will help to understand how our body deals with ingested MNPs.

The planned investigations include cell culture experiments, various molecular microbiological methods such as cytokine determinations as well as transmission electron microscopic (TEM) investigations and are ideally suited for a doctoral thesis.

The project is part of the EU funded project: <https://www.plasticsfate.eu>



Supervision and further information: Prof. Dr. med. Friedrich Paulsen, HonFAS | Head Institute of Functional and Clinical Anatomy | FAU Erlangen | President European Federation of Experimental Morphology Universitätsstr. 19 | 91054 Erlangen | Germany, [E-Mail: friedrich.paulsen@fau.de](mailto:friedrich.paulsen@fau.de)