Toxicity and Health Effects of Shipping Emission

T. Wendt (1), A. Arnou (1), U. Voss (1), C. Isaxon (2), L. Ohlsson (2) and S. Ansar (1)

1. Department of Clinical Sciences, Faculty of Medicine, Lund University, Lund, Sweden
2. Department of Design Sciences, Faculty of Engineering, Lund University, Lund, Sweden

Tel.: +46-703809786
Saema.Ansar@med.lu.se

Abstract (4-6 lines, 500-700 letters incl. spaces)

Exposure to pollution results in over 7 million deaths annually, making it the fourth leading cause of death worldwide. Maritime transport is a major contributor to air pollution, significantly impacting public health. Ambient airborne particles with an aerodynamic diameter of less than 2.5 µm (PM2.5), produced by combustion processes, are linked to elevated risks of cancer, as well as respiratory, cardiovascular, and neurodegenerative diseases. The adoption of new cleaner fuels and energy systems with improved health profiles is essential to comply with the regulations coming in force in EU and worldwide on shipping especially in ports.

It is critically important to thoroughly understand the health profiles of new fuels and associated technologies during their development and implementation for the shipping industry. Accurate health impact assessments and comprehensive risk evaluations require dose-dependent toxicological studies. Our research, using human cells and *in vivo* models, has shown that PM2.5 exacerbates oxidative stress, inflammation, and compromises the endothelial cell barrier in a dose-dependent manner—these are early indicators of disease onset. As the first contact point for emission particles, barrier cells influence all downstream actions, allowing for comprehensive systemic health impact modeling. Having analyzed impact of PM2.5, our research is striving on evaluating the health impact of emissions form new fuels being developed for shipping through human tissue experimentation.

Please deliver short abstract asap to SSD@efcf.com: