

FinelInfect –Particulate Matter in Focus: Effects on molecular mechanisms during respiratory infections

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Air pollution caused by fine particulate (PM) matter from industry, traffic, and the burning of fossil fuels poses a significant global health risk, particularly for immunocompromised individuals. Infections with influenza A viruses (IAVs) and/or the fungus *Aspergillus fumigatus* can cause severe, often life-threatening pulmonary diseases. General research findings suggest that air pollution could further exacerbate the spread and severity of such infections. However, the impact of exposure to PM on the interplay between pathogens and the immune system remains poorly understood.

The aim of the project is to establish simple and complex *in vitro* cell culture models as well as an *ex vivo* mouse lung model to investigate the effects of environmental factors on pathogen-host interactions. The project focus on the impact of standardized, commercially available fine dust particles of different sizes on IAV infection and IAV-associated co-infections with *A. fumigatus*.

Here, we present initial results from infection experiments in various cell culture systems. While inhibition of IAV-induced cellular mechanisms, such as interferon-beta-mediated signaling was frequently observed, independent of the PM source and the cell culture model examined, effects on viral replication were dependent on the cell type and timing of PM incubation. Furthermore, we will provide first evidence of PM-mediated effects on cell cycle progression and the consequences for infection.

Keywords

particulate matter, influenza A virus infection, pathogen-host interaction

Professional status of the speaker

Professor

Junior scientist status

No, I am not a junior scientist.

Registration ID

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