



ID der Kurzfassung : 370

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

Inhalt

Air pollution caused by fine particulate matter (PM) resulting from industry, traffic, and fossil fuel combustion is a major risk for respiratory diseases. Influenza A viruses (IAVs) are a leading cause of acute respiratory illness, and recent findings suggest that PM can influence the host responses during infection. While PM increases susceptibility to infection, the underlying mechanisms remain unclear.

Our *in vitro* data show that cell morphology remained intact in presence of PM of various sources and lactate-dehydrogenase release increased only slightly, whereas mitochondrial activity was reduced. Interestingly, PM modulated the host immune response in a cell-type- and time-dependent manner, with differences observed based on the specific composition of the PM. While IAV-induced type I IFN response was reduced, IL-6 and IL-8 were upregulated, indicating selective immune regulation toward inflammation. Although early stages of infection appeared to be unaffected in presence of PM, viral titers decreased in certain cell types, suggesting interference with post-entry steps. We also observed PM-induced alterations in cell cycle regulators, pointing to disrupted cell cycle progression that may be driven by the paradoxical immune modulation.

Future work will characterize these effects, resolve their temporal dynamics, and use more complex cell culture models to further elucidate their biological significance.

Keywords

air pollution, particulate matter, influenza A virus, innate immune response, pathogen host-interaction

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Professional Status of the Speaker

Professor

Junior Scientist Status

No, I am not a Junior Scientist.

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