

COMPARISON OF DIRECT EXPOSURE OF HUMAN LUNG CELLS TO MODERN ENGINE EXHAUST PARTICLES

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ABSTRACT

Cultured human lung cells have been exposed in situ to dilute exhaust from two different vehicles, a gasoline spark-ignited vehicle equipped with a three-way catalyst and a light-duty diesel equipped with a catalyzed diesel particulate filter. Both of these vehicles have extremely low particulate mass emissions, on the order of 5 mg/mile. Particle size and number concentrations are monitored by a scanning mobility particle sizer.

As in previous reports to DEER, the cells are grown in transwell membranes, and dilute exhaust is pumped through the chamber, allowing exhaust nanoparticles to interact individually with the cells. Measurements of cell inflammatory response, including interleukin-8 production and LDH, are reported for time-resolved exposures up to 6.5 hours in duration. A cold start is included in each test sequence.