Particulate-induced Pulmonary Injury

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Airborne particles are of widespread environmental and occupational health concern and are known to induce a variety of important lung diseases. Health effects of inhaled particulate matter (PM) are an important priority issue of the U. S. EPA and were identified as one of the important American Chemistry Council research issues by the State of the Science effort. The CIIT particle toxicology program is focused on mechanisms of particle-induced airway injury and on understanding differences in animal model responses to inhaled PM, especially those in the ultrafine size range (< 0.1 mm diameter). The primary emphasis of work to date has been to develop a virus model of lung compromise with respiratory syncytial virus (RSV) to examine the effects of inhaled particles in individuals predisposed to pulmonary dysfunction. RSV infections are an extremely important childhood disease that predisposes individuals to the effects of inhaled toxicants. In addition to efforts in compromised animals using RSV, the CIIT particle toxicology studies have focused on developing expertise with selected endpoints that can be used to study the effects of particles on airway epithelium. These include noninvasive physiological measurements such as the determination of airway hyperresponsiveness, as well as cellular and molecular analysis of gene expression changes in lung cells following inhalation exposure to characterized aerosols.

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