

Seminar Series 2015 - 2016

Southern Ontario Centre for Atmospheric Aerosol Research
University of Toronto

Chronic Exposure to Atmospheric Secondary Organic Particulate Matter Enhances Airway Hyper-responsiveness to Methacholine



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Exposure to air pollution increases the incidence and morbidity of cardiorespiratory diseases. Air pollutants are a complex mixture of gases and particulate matter (PM), which is comprised of Secondary Organic Aerosols (SOA), formed through the oxidation of biogenic and anthropogenic emissions. Experimental models to evaluate the physiological and cellular pathways activated by chronic exposures are limited. We recently developed an experimental platform that permits chronic exposure of PM and gases to allow us to evaluate the health effects of relevant pollutants at “real-life” levels.

Healthy female 8-10 week old Balb/c mice were exposed for 1 hr/day for 3 consecutive days to naphthalene SOA which was maintained at constant levels ($10-150 \text{ mg/m}^3$) to simulate street level PM concentration during exposures. Results showed that chronic daily exposures to naphthalene SOA increased airway responsiveness to methacholine in a dose-dependent manner, and the responsiveness was significantly increased when compared to control filter-air exposed mice. BALF total and differential cell counts were similar in all groups, suggesting that increased airway responsiveness was not associated with airway inflammation. Gene expression and histological analyses are in progress.

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Wallberg Building, 200 College Street, Room 215

