environmental factors affecting the transformation between the 2 oxidation states.

Methods: A 24-hour exposure study was undertaken in a controlled environmental facility in the absence of sunlight by pulling clean air or clean air mixed with O_3, SO_2, and NO_2 through filters, which were pre-collected with diesel particles (DPM) or secondary organic aerosol (SOA). Isotope spiking (53Cr-VI and 50Cr-III) was used to monitor the redox change of chromium species within the exposure process. The exposure factors included O_3, SO_2, NO_2, airborne particle type, temperature, and humidity. ANOVA test ($P = 0.05$) was used.

Results: After exposure to clean air, neither significant reduction nor oxidation was found. Compared to control, exposure to 160 ppb SO_2 promoted significant reduction of Cr-VI in DPM (40.8 ± 3.5%, n = 3, $P = 0.0022$) and SOA (41.9 ± 6.8%, n = 3, $P < 0.0001$).

Conclusion: The results suggested SO_2 as a potential reductant for ambient Cr-VI. Our study also suggested that O_3 may promote reduction of Cr-VI while NO_2 may induce oxidation of Cr-III in the presence of ambient organics. Another finding is that Cr-III is easily oxidized in SOA than DPM, probably because of the organic composition and liquid microenvironment of SOA. Further study will be undertaken to understand the mechanisms behind the transformation we found in the controlled environmental facility tests.

PP-29-039

Ambient Particulate Matter Exposure and Hypertension Incidence in the Multiethnic Study of Atherosclerosis

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Background/Aims: Despite evidence of a cross-sectional association between ambient fine particulate matter ($PM_{2.5}$) and high blood pressure, no population-based study has explored the association of fine particle exposure with incident hypertension. This study examined whether ambient $PM_{2.5}$ is associated with hypertension incidence.

Methods: The study included 3006 participants, aged 45–84 years and without hypertension (systolic blood pressure ≥140 mm Hg, diastolic blood pressure ≥90 mm Hg, or on antihypertensive medications) at the baseline examination (2000–2002) of the Multiethnic Study of Atherosclerosis. Annual average $PM_{2.5}$ concentrations at participant residences were calculated for 2001 using a spatio-temporal model and used as a proxy for exposure over the 5-year follow-up period. Incident hypertension was defined by participant's SBP ≥ 140 mm Hg, DBP ≥ 90 mm Hg, or on antihypertensive medications at follow-up visits. Hazard ratios of incident hypertension per 10 $\mu g/m^3$ increment in $PM_{2.5}$ were estimated using interval censored survival analysis, adjusting for age, sex, race/ethnicity, systolic blood pressure, diastolic blood pressure, body mass index, diabetes, smoking, passive smoking, alcohol use, healthy diet index, and physical activity at baseline.

Results: A total of 825 new cases of hypertension occurred over the 5-year follow-up. The mean estimated $PM_{2.5}$ exposure was 17.3 $\mu g/m^3$ (standard deviation, 3.2 $\mu g/m^3$). For each 10 $\mu g/m^3$ increment of $PM_{2.5}$, the adjusted hazard ratio for incident hypertension was 1.22 (95% confidence interval, 0.93–1.59). The point estimate of association remained positive and not statistically significant after further adjustment for study site and socioeconomic status (income and education) at baseline.

Conclusion: Results from our study sample provide only weak support to the hypothesis that exposure to ambient fine particulate air pollution may contribute to onset of hypertension.

PP-29-040

Personal Exposures to Particle-bound Polycyclic Aromatic Hydrocarbons for the Elderly and Elementary School Children

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Background/Aims: Nowadays people spend more than 80% of the time indoors for the daily life, where polycyclic aromatic hydrocarbons (PAHs) is one of the indoor pollutants. It has been reported that PAHs ranked as probable human carcinogens are primarily associated with the particulate phase. Therefore, the characterization of exposure to particle-bound PAHs is critical in assessing the health risks in our daily life.

Methods: The strategic plan of the study has been presented previously. In brief, a panel study was conducted during the years 2003 and 2005 to examine the health effects of particulate air pollution on susceptible populations. The current paper focuses on assessing exposures to particle-bound PAHs for both of school-age children with asthma and elderly people living within the metropolitan Taipei area. During the study, integrated personal exposure samples were collected by a dust monitor (model 1.108, Grimm) for PAHs analysis using gas chromatograph-mass spectrometer. The sampling durations for the elderly population and children were 24 hours and 5 days, respectively. Overall, 23 samples for elderly people and 52 samples for the children were included in the data analysis.

Results: Results showed that geometric mean levels (and geometric standard deviation) of PAHs exposures were 11.98 (27.32) ng/m^3 for the elderly people and 4.44 (3.40) ng/m^3 for children. The top 3 highest proportions of PAHs components were IND (22%), BghiP (18%), and DBA (9%) for children, all of which are 6-ring PAHs. The top 3 highest proportions of PAHs components were Flu (24%), Atlanta commuters exposures (21%), and DBA (11%) for the elderly population, with elderly people showing a higher low-ring PAHs composition, which might be due to the fact that elderly people usually spent more time in indoor microenvironments. On the other hand, results from 8 types of characteristic value (BaA/Chry, BaP/BghiP, IND/BghiP, BghiP/IND, Flrt/Pyr, BaP/(BaP + Chry), FL/(FL + Pyr), and IND/(IND + BghiP)) showed that traffic pollution was one of the major PAHs sources for children. The principal components analysis also found that the factor 1, the contribution of traffic source, could account for 25.54% of their total variation.

Conclusion: In conclusion, traffic pollution sources influenced children's exposures to PAHs apparently, whereas PAHs exposures of the elderly people were mainly affected by indoor pollution sources (such as smoking and incense burning). In addition, elders' PAHs exposures were higher than those of children, whereas the children faced higher percentage of carcinogenic PAHs than the elderly did. Future studies are warranted for further investigation.

PP-29-041

The Exposure to Ozone Is Associated With Asthma, Allergic Rhinitis, and Allergic Sensitization in Schoolchildren

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Background/Aims: Recent increasing trend of prevalence of allergic diseases is at least partly attributable to environmental change. This study