

Understanding Air Pollution in the Era of Genome-Wide Association Studies

Co-chairs:

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Aim and short description: Genome-wide association studies (GWAS) conducted over the past few years largely ignored gene-environment interactions. However, the GWAS era has led to the formation of large research consortia with extensive genetic data on participants from many cohorts. The research networks can now exploit genetic data to improve understanding of how and in whom environmental exposures such as air pollutants exert their complex health effects. In the context of their experience and of the previous presentations during the session the panel members will point to the challenges in elucidating mechanisms by which environmental factors influence health. They will critically evaluate the relevance of replicating gene-environment interactions, discuss methodological issues, touch upon the potential relevance of epigenetic phenomena and point out needs regarding exposure and phenotype assessment.

The symposium aims at

- a) presenting evidence on the mechanisms linking air pollution and health
- b) discussing the potential role of epigenetics in air pollution epidemiology
- c) presenting aims and methods for the assessment of gene-air pollution interactions
- d) presenting results of agnostic and non-agnostic analyses of interactions between genetic variants and inhaled toxicants
- e) critically discussing the challenges of assessing gene-environment interactions

Presentations:

1. Air pollution, genes, and mechanisms
Speaker: Peters Annette, Helmholtz Zentrum München, Institute of Epidemiology, Germany
2. The potential role of epigenetics in mediating air pollution effects
Speaker: Baccarelli Andrea, Harvard School of Public Health, USA

Agnostic and non-agnostic assessments of interactions between inhaled pollutants and genes:
Methods and results

3. Genome-Wide Interaction Study (GWIS) on occupational hazards and asthma
Speaker: Kogevinas Manolis, CREAL, Barcelona
4. Oxidative stress pathway genes, environmental tobacco exposure and asthma
Speaker: Nadif Rachel, INSERM CESP/U1018, France
5. Oxidative stress pathway genes, particulate matter, and lung function decline
Speaker: Curjuric Ivan, Swiss TPH, Basel, Switzerland
6. **Panel discussion** on the evolution of scientific collaboration in the era of genome-wide association studies
Panel members:
Nicole Probst-Hensch, Swiss Tropical and Public Health Institute, Basel, Switzerland
Frank Gilliland, Keck School of Medicine, University of Southern California, Los Angeles, USA
Stephanie London, National Institute of Environmental Health Science, North Carolina, USA
Francine Kauffmann, Inserm, CESP-U1018, Paris, France