



**GSF – National Research Center
for Environment and Health**
member of the Helmholtz Association




afsset
agence française de **sécurité sanitaire**
de l'environnement et du travail



Inserm
Institut national
de la santé et de la recherche médicale

International Workshop on Air Pollution and Human Reproduction

May 9-11, 2007
Munich (Neuherberg), GSF campus, Institute of Epidemiology



**A Workshop of the GSF Focus Network Aerosols and Health
Scientific Program**

The workshop is made possible by a grant from AFSSET (the French Agency for Environmental and Occupational Health Safety) and is further supported by GSF-National Research Center for Environment and Health and BFHZ (Bavarian-French Center for University Cooperation)

WEDNESDAY, MAY 9, 2007 – 9:00-12:30

Session 1: Introduction to the workshop

- | | |
|-------------|---|
| 9:00-9:50 | Registration |
| 9:50-10:00 | 1a) Welcome address. General introduction to the workshop <i>H.-Erich Wichmann (GSF, Munich)</i> |
| 10:00-10:10 | 1b) General introduction to the workshop <i>Workshop scientific committee</i> |
| 10:10-10:40 | 1c) Early programming hypothesis: early exposures and late effects <i>Michael Symonds (University of Nottingham, UK)</i> |
| 10:40-11:00 | Coffee break |
| 11:00-11:30 | 1d) Biological and toxicological mechanisms leading to altered semen quality, with a focus on mechanisms relevant to environmental contaminants <i>Jorma Toppari (University of Turku, Finland)</i> |
| 11:30-12:00 | 1e) Air pollution and mortality: historical perspectives on the emergence of a research field <i>Nino Künzli (IMIM, Barcelona)(to be confirmed)</i> |
| 12:00-14:00 | Lunch Constitution and first meeting of the working groups |

WEDNESDAY, MAY 9, 2007 – 14:00-17:40

Session 2: Opening the tool box (I): Epidemiological design

2a) What are the main methodological issues in the study of air pollution effects on human reproduction?

- 14:00-14:30 Air pollution, gestational duration and intra-uterine growth: A conceptual framework for the study of the influence of environmental factors on intra-uterine growth
Clarice Weinberg (National Institute of Environmental Health Sciences, Triangle Park)
- 14:30-15:00 Are confounding and selection bias a major issue and how can we control for them?
Katherine Hoggatt (University of Michigan) and short examples from other groups
- 15:00-15:20 Discussion
- 15:20-15:40 Are there disparities (according to social classes or other factors associated with reproductive health) in exposure to air pollutants?
Short examples
Discussant: Tracey Woodruff (US Environmental Protection Agency, San Francisco)
- 15:40-15:50 Population selection: Can the selection of women living in the vicinity of background monitoring stations lead to bias?
Rémy Slama (GSF, Munich, and Inserm, Paris).
- 15:50-16:00 Coffee break
- 16:00-16:30 Poster-discussion session (with brief presentation of each poster)
- 16:30-16:40 Use of ultrasound measurements to detect early effects of pollutants on IUGR
Rémy Slama (GSF, Munich, and Inserm, Paris).
- 2b) Time-series and related designs:**
- 16:40-17:00 Use and limitations of the time-series and case-crossover designs: Are these relevant designs for reproductive health?
Annette Peters (GSF, Munich)
- 17:00-17:20 Discussion
- 17:20-17:40 **2c) Can intervention studies be undertaken or "natural experiments" be used to more clearly highlight the benefits of improvements in air quality for reproductive health?**
Joachim Heinrich (GSF, Munich)
- 19:00 Welcome dinner

THURSDAY, MAY 10, 2007 – 09:00-11:50

Session 3: Opening the tool box (II): Exposure assessment

- 09:00-09:30 **3c) Do we need individual level exposure assessment?** "Small is beautiful" vs large-scale studies
Bert Brunekreef (Utrecht University) (To be confirmed)
Discussant:
- 09:30-10:10 **3b) Background monitoring stations: Are we underestimating the effect of air pollutants? Issues related to exposure misclassification**

Michelle Wilhelm (UCLA, Los Angeles)

Short examples from other groups

Discussant:

- 10:10-10:20 **3a) New approaches to characterize ambient aerosols** (particle mass, size, surface, organic liaison, and composition, source apportionment)
Josef Cyrus, (University of Augsburg and GSF, Munich)
- 10:20-10:30 Factors associated with changes of address after pregnancy
Verena Morgenstern (GSF, Munich)
- 10:30-10:50 Coffee break
- 10:50-11:10 3e) Land-use regression and dispersion modeling.
Discussant: Mike Brauer (University of British Columbia, Vancouver)
Modeling of space-time variations in air pollution in the context of studies on human reproduction
David Briggs (Imperial College, London) (To be confirmed)
- 11:10-11:15 Short example: Dynamic modelling of space-time variations of particulate matter
Tanja Pless-Mulloli (University of Newcastle Upon-Tyne)
- 11:15-11:30 Discussion
- 11:30-12:00 **3.f) Lessons from other fields (1):**
Water disinfection by-products and reproductive health: methodological considerations
Mark Nieuwenhuijsen (IMIM, Barcelona)
- 12:00-14:00 Lunch and meeting of the working groups

THURSDAY, MAY 10, 2007 – 14:00-18:00

Session 4: From pollutants to newborns: opening the black box

4.a) From the pollutant to the placenta...

How do atmospheric pollutants metabolize in the organism, and what is the evidence that these pollutants or metabolites reach key organs implied in reproductive function?

- 14:00-14:20 "Pollutant-DNA adduct hypothesis": PAH in the air and PAH-DNA adducts in the fetus: is the evidence convincing or do we need further data?
Radim Šrám (Institute of Experimental Medicine, Prag)
- 14:20-14:40 Distribution of inhaled particles in the organism
Wolfgang Kreyling (GSF, Munich)
- 14:40-15:00 "Hypoxia hypothesis": Air pollution and plasma viscosity
Annette Peters (GSF, Munich)
- 15:00-15:20 Coffee break

4.b) ...From the placenta to the newborn...

Critical discussions of the following mechanisms and discussion of the possible tool to confirm/infirm them:

- 15:20-15:50 Pollutant-DNA adducts hypothesis: Role of placental genetic and epigenetic factors on intra-uterine growth
Daniel Vaiman (Inserm, Paris)(to be confirmed)
Discussion of the relevance of this hypothesis concerning PAHs: F.Perera, to be confirmed
- 15:50-16:10 "Hypoxia hypothesis": Maternal plasma viscosity, maternal-fetal oxygen transfer and IUGR. Assessment by ultrasound imaging.

Philippe Arbeille (Inserm, Tours).

16:10-16:35 Role of inflammatory and immunological factors in IUGR and prematurity

16:35-17:00 Discussion

17:00-17:30 **4.c) Lessons from other fields (2):**
From smoking pipes to smoking women: Tobacco smoke and IUGR
Wojtek Hanke (Nofer Institute of Occupational Medicine, Lodz)
 Discussion

FRIDAY, MAY 11, 09:00-12:10

4d) Mixture of effects / Effect measure modifications or biologic interaction:

What are the hypotheses or results in favor of modifications of the estimated effect of air pollution on reproduction by other factors?

09:00-09:10 Biological versus statistical interactions: a methodological note

09:10-09:40 Effect modification of air pollutants by nutrition?
Srimathi Kannan (University of Michigan, Ann-Harbor)
 Discussant:

09:40-10:20 Effect modifications between air pollutants and epigenetic/genetic factors
Claire Infante-Rivard (McGill University, Montreal, to be confirmed)
 Discussant:

10:20-10:30 *GST M1* genotype influences the susceptibility of men to sperm DNA damage associated with exposure to air pollution
Jiri Rubes (Veterinary Research Institute, Brno)

10:30-10:45 Coffee break

FRIDAY, MAY 11, 2007, 10:45-11:35

Session 5: Public health issues

10:45-11:05 5a) Possible short and long-term consequences of prematurity and intra-uterine growth retardation

11:05-11:35 5b) How can reproductive endpoints be considered in the estimation of the burden of disease due to air pollution?
Finton Hurley (Institute of Occupational Medicine, UK)
 Discussant:

Session 6: Workshop conclusion

11:35-13:05 **6a) Working lunch: Reports from the working groups**

13:05-13:20 **6b) Wrap-up talk and discussion of future actions.**
 If money and subject compliance were no hindrance, how would you design your next study on the effects of air pollutants on IUGR? / Prematurity? / Semen quality?
Beate Ritz (UCLA, Los Angeles, and IARC, Lyons)

13:20-13:30 *Concluding remarks. End of the workshop.*