

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

Standing Committee on Emerging Science for Environmental Health Decisions

USE OF *IN UTERO* AND POST-NATAL INDICATORS TO PREDICT HEALTH OUTCOMES LATER IN LIFE

OCTOBER 14-15, 2010

SUGGESTED READING

SESSION 1: Introduction

- Background on Information on Epigenetics:

Use of Emerging Science and Technologies to Explore Epigenetic Mechanisms Underlying the Developmental Basis for Disease. The Newsletter of the Standing Committee on Use of Emerging Science for Environmental Health Decisions. Issue 01, January 2010.
http://dels-old.nas.edu/envirohealth/newsletters/newsletter1_epigenetics.pdf
- Joss-Moore and Lane 2009. The developmental origins of adult disease. *Current Opinion in Pediatrics*. 21(2):230-234.
<http://www.ncbi.nlm.nih.gov/pubmed/19663040>
- Joss-Moore et al. 2010. Epigenetics and fetal adaptation to perinatal events: Diversity through fidelity. *Journal of Animal Science*. 88(13 Suppl): E216-222.
<http://www.ncbi.nlm.nih.gov/pubmed/19854998>

SESSION 2: Fetal Programming on Later Life Effects

→ **Emerging Science: *in utero* and post-natal indicators that predict endpoints such as obesity, insulin, resistance, and hypertension**

- Burdge and Lillycrop. 2010. Nutrition, epigenetics, and developmental plasticity: Implications for understanding. *Annual Reviews of Nutrition*. 30:315-339.
<http://www.ncbi.nlm.nih.gov/pubmed/20415585>
- Burdge et al. 2007. Epigenetic regulation of transcription: A mechanism for inducing variations in phenotype (fetal programming) by differences in nutrition during early life? *British Journal of Nutrition*. 97(6):1036-1046.
<http://www.ncbi.nlm.nih.gov/pubmed/17381976>
- Burdge et al. 2008. The nature of the growth pattern and of the metabolic response to fasting in the rat are dependent upon the dietary protein and folic acid intakes of their pregnant dams and post-weaning fat consumption. *British Journal of Nutrition*. 99(3):540-549.

<http://www.ncbi.nlm.nih.gov/pubmed/17761015>

- Grun and Blumberg. 2009. Endocrine disruptors as obesogens. *Molecular and Cellular Endocrinology*. 304(1-2):19-29.
<http://www.ncbi.nlm.nih.gov/pubmed/19433244>
- Kirchner et al. 2010. Prenatal exposure to the environmental obesogen tributyltin predisposes multipotent stem cells to become adipocytes. *Molecular Endocrinology*. 24(3):526-39.
<http://www.ncbi.nlm.nih.gov/pubmed/20160124>
- Lillycrop and Burdge. 2010. Epigenetic changes in early life and future risk of obesity. *International Journal of Obesity*. June 15 [Epub ahead of print].
<http://www.ncbi.nlm.nih.gov/pubmed/20548303>
- Lillycrop et al. 2007. Induction of altered epigenetic regulation of the hepatic glucocorticoid receptor in the offspring of rats fed a protein-restricted diet during pregnancy suggests that reduced DNA methyltransferase-1 expression is involved in impaired DNA methylation and changes in histone modifications. *British Journal of Nutrition*. 97(6):1064-1073.
<http://www.ncbi.nlm.nih.gov/pubmed/17433129>
- Myatt, L. 2006. Placental adaptive responses and fetal programming. *Journal of Physiology*. 517(1):25-30.
<http://www.ncbi.nlm.nih.gov/pubmed/16469781>
- Webster et al. 2008. Protein nitration in placenta: Functional significance. *Placenta*. 29(12):985-94.
<http://www.ncbi.nlm.nih.gov/pubmed/18851882>

→ Emerging Science: *in utero* and post-natal indicators that predict diseases caused by arsenic exposure

- Hall et al. 2006. Blood arsenic as a biomarker of arsenic exposure: Results from a prospective study. *Toxicology*. 225(2-3):225-33.
<http://www.ncbi.nlm.nih.gov/pubmed/16860454>
- Hall et al. 2007. Determinants of arsenic metabolism: Blood arsenic metabolites, plasma folate, cobalamin, and homocysteine concentrations in maternal-newborn pairs. *Toxicology*. 115(10):1503-9.
<http://www.ncbi.nlm.nih.gov/pubmed/17938743>
- Srivastava et al. 2007. *In utero* arsenic exposure induces early onset of atherosclerosis in ApoE^{-/-} mice. *Reproductive Toxicology*. 23(3):449-56.
<http://www.ncbi.nlm.nih.gov/pubmed/17317095>

- States et al. 2009. Arsenic and cardiovascular disease. *Toxicological Sciences*. 107(2):312-23.
<http://www.ncbi.nlm.nih.gov/pubmed/19015167>
- Tokar et al. 2010. Arsenic-specific stem cell selection during malignant transformation. *Journal of the National Cancer Institute*. 102(9):638-649.
<http://www.ncbi.nlm.nih.gov/pubmed/20339138>
- Tokar et al. 2010. Arsenic exposure transforms human epithelial stem/progenitor cells into a cancer stem-like phenotype. *Environmental Health Perspectives*. 118(1):108-115.
<http://www.ncbi.nlm.nih.gov/pubmed/20056578>
- Waalkes et al. 2007. Transplacental arsenic carcinogenesis in mice. *Toxicology and Applied Pharmacology*. 222(3):217-280.
<http://www.ncbi.nlm.nih.gov/pubmed/17306315>
- Waalkes et al. 2008. Arsenic exposure in utero exacerbates skin cancer response in adulthood with contemporaneous distortion of tumor stem cell dynamics. *Cancer Research*. 68(20):8278-8285.
<http://www.ncbi.nlm.nih.gov/pubmed/18922899>