

## In This Issue

This issue of the *Journal of Developmental Origins of Health and Disease* contains three review articles, two brief reports and five original articles. The review articles include topics of placental transport, as well as newborn body composition and neonatal interventions. The brief reports and original articles include two studies of animal models, and a series of human studies examining outcomes of growth, longevity, breast tumors and respiratory disease.

### Reviews

**Placental transport in response to altered maternal nutrition.** Gaccioli and colleagues propose that the placenta integrates both maternal and fetal nutritional cues from intrinsic nutrient sensors, ultimately regulating placental nutrient transporters. The authors provide data suggesting that the placenta responds to both maternal nutrient cues as well as fetal demand signals.

**Infant body composition in the PEA POD<sup>®</sup> era: what have we learned and where do we go from here?** Li and colleagues examined published studies using the PEA POD<sup>®</sup> infant body composition system. As most of the published studies have incomplete or absent reporting of factors that may influence growth or later health (e.g. maternal dietary intake, body mass index), the authors encourage future studies to report specific factors that may influence infant body composition.

**Prematurity and programming: contribution of Neonatal Intensive Care Unit interventions.** Kalhan and Wilson-Costello review events associated with Neonatal Intensive Care Unit interventions, which may have a programming effect. The results suggest that premature birth is a major contributor to reduced insulin sensitivity at an older age, compounded by weight gain during infancy.

### Brief Reports

**Placental expression of the obesity-associated gene FTO is reduced by fetal growth restriction but not by macrosomia in rats and humans.** Mayeur and colleagues measured the placental suppression of FTO (fat mass- and obesity-associated) gene in intrauterine growth restriction (IUGR) and macrosomic rats and humans. Placental FTO mRNA expression was reduced in IUGR, but not affected by macrosomia in either rats or humans, suggesting that placental FTO may influence fetal growth under IUGR conditions.

**Birth weight predicts both proteinuria and overweight/obesity in a rural population of Aboriginal and non-Aboriginal Canadians.** Oster and colleagues examined aboriginal Canadians, in whom the prevalence of end-stage renal disease, cardiovascular disease risk and diabetes prevalence is disproportionately increased. The authors found a significant association between low birth weight and proteinuria as well as high birth weight and overweight/obesity, emphasizing the need for optimal prenatal care in these populations.

### Original Articles

**Effects of glucocorticoid treatment given in early or late gestation on growth and development in sheep.** Li and colleagues examined the effects of maternal glucocorticoid treatment in both early and late ovine gestation. Repeated betamethasone administration was associated with reduction in fetal body, brain, heart, kidney and liver weight and reductions in plasma insulin, leptin and triiodothyronine. These findings provide further evidence that maternal glucocorticoid administration may have significant effects on fetal growth and metabolic hormones that persist into postnatal life.

**Polymorphisms in genes within the IGF-axis influence antenatal and postnatal growth.** Parmar and colleagues utilize two pregnancy cohorts to investigate the association between single-nucleotide polymorphisms (SNPs) in genes within the insulin-like growth factor (IGF) axis and antenatal and postnatal growth. Twenty-six SNPs were significantly associated with both antenatal and postnatal growth, with 17 having discordant effects and one concordant effect. These findings provide further evidence that genetic variance in the IGF axis may play a significant role in antenatal and postnatal growth.

**Early origins of longevity: prenatal exposures to food shortage among early Utah pioneers.** Hanson and Smith utilized the Utah Population Database to examine effects of famine in the mid-19th century. Males born during the famine had higher mortality risks after age 50 compared with post-famine cohorts, whereas females had higher initial mortality risks starting at age 50 that then declined over time. These findings are consistent with an association between pregnancy undernutrition and adult mortality, which may be influenced by the duration and gestational period of exposure.

**Exposures in early life: associations with DNA promoter methylation in breast tumors.** In a case–controlled study, Tao and colleagues examined DNA methylation patterns

in breast tumors in association with early-life exposures. Among patients with pre-menopausal breast cancer, lower birth weight was associated with increased likelihood of *E-cadherin* promoter methylation, whereas other methylation alterations were associated with adult height and breastfeeding. The results suggest that potential alterations in methylation, which may affect breast cancer risk, may be associated with early-life exposures.

**Street drug use during pregnancy: potential programming effects on preschool wheeze.** Alton and colleagues utilized

questionnaire data from the community perinatal trial in Calgary, Alberta to assess the association between maternal substance use and wheezing and allergy in 3-year-old offspring. Maternal street drug use was associated with wheezing in girls, though not boys. These findings provide further support for the treatment of drug addiction during pregnancy to improve the long-term health of children.

Michael G. Ross, M.D., M.P.H.

Editor-In-Chief

Journal of Developmental Origins of Health and Disease (J DOHaD)