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## In This Issue

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# In This Issue

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This issue of the Journal of Developmental Origins of Health and Disease contains three excellent review articles and 15 original manuscripts. Among the articles, two original manuscripts extend studies of the potential programming effects of maternal high fat diet, demonstrating significant impact of brown fat and ileum neuroplasticity and histology.

## Review Articles

**Biomarkers of cardiovascular disease risk in the neonatal population**. Lianou et al examine neonatal biomarkers that contribute to the development of adult cardiovascular disease. As reviewed by the authors, adiposity, insulin resistance, altered lipid profile, inflammation, and endothelial dysfunction contribute to cardiovascular disease. The authors further emphasize the important contribution of adiponectin and leptin.

**Understanding the importance of the early-life period for adult life: A systematic review.** Hildreth and coauthors utilize a systematic review to explore both awareness and understanding of the long-term effects of the early life environment on adult health. The authors identify three common themes: 1) tendency for researchers to conflate participant understanding; 2) bias in both researchers and participants toward short-term thinking; and 3) challenges in comprehending the complexity of the evidence. The authors emphasize the importance of a broader approach to communicating the evidence relating early-life environment to adult health.

**When a birth cohort grows up: Challenges and opportunities in longitudinal developmental origins of health and disease research**. Oken and coauthors examine the challenges and lessons learned in following birth cohorts longitudinally. The authors provide important recommendations to maintain funding, contact with subjects, maximize engagement, optimal data collection and ongoing participation. The authors further emphasize that it is essential for cohorts to strive for broad representations among both participants and staff.

## Original Manuscripts

**Evaluation of H19, Mest Meg3 and Peg3 genes affecting growth and metabolism in umbilical cord blood cells in infants born to mothers with gestational diabetes and healthy mothers in Rafsanjan, Iran**. Abad et al examine cord blood of 40 infants born to mothers with GDM and 35 infants born to healthy mothers. Findings demonstrate that expression of Meg3, Peg3, H19 and Mest genes were significantly decreased in mononuclear cord blood cells of infants born to mothers with GDM. These findings indicate that the reduction of the expression of imprinted genes in mothers with GDM is likely due to changes in methylation.

**Life course of retrospective harmonization initiatives: Key elements to consider**. Fortier and colleagues assess the importance of cohort study data to be harmonized, in order to improve comparability of equivalent measures collected by different studies on different individuals. The authors provide an overview of the life course of research projects requiring harmonization from the inception to the end of the project.

**Associations between maternal exposure to surgery or pregnancy exposure to fluorinated anesthetics and children's cognitive development and educational outcomes.** Kravets et al examine associations of maternal lifetime exposure to anesthesia and pregnancy exposure to fluorinated anesthetics with childhood cognitive outcomes. The results show inconsistent evidence of these exposures on child developmental and educational outcomes and suggest that confounding may explain some previously observed associations.

**Peripubertal soy isoflavone consumption leads to subclinical hypothyroidism in male Wistar rats**. Forno et al examine the exposure to the flavonoid group of phytoestrogens in male rats exposed from weaning to 60 days of age. The results indicate that the consumption of relevant doses of isoflavones during the peripubertal period in males may induce subclinical hypothyroidism with modulations in thyroid hormone target organs.

**Thermoneutrality effects on developmental programming of obesity.** Desai and coauthors examine the impact of two housing temperatures (22°C and 30°C) on obesity development in male and female offspring of control and food-restricted dams. As expected food-restricted dams' offspring exhibited hyperphagia and increased adiposity as compared to controls. There were sex-specific effects of temperature in both groups with male offspring at temperature neutrality (30°C) heavier with increased body fat as compared to cold-exposed males. These findings emphasize the importance of the thermal environment and discuss whether thermoneutrality temperature is based on the animals species or human standards.

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**Perinatal and post-weaning exposure to a high-fat diet causes histomorphometric, neuroplastic and histopathological changes in the rat ileum.** Cordeiro and colleagues examine the effect of high-fat diet during the perinatal and weaning periods on the rat ileum. Evidence indicates that high-fat diet altered the histology and neuroplasticity of the offspring ileum.

**Birth weight and cardiometabolic risk factors: A discordant twin study in the UK biobank**. Wang and colleague utilized a discordant twin study of 120 monozygotic and 148 dizygotic twin pairs. The study provides no strong evidence for intrauterine effects on later-life cardiometabolic risk factors and does not support the hypothesis that an adverse intrauterine environment increases the risk of cardiometabolic disease in later life.

**Effects of early-life voluntary exercise and fructose on adult activity levels, body composition, aerobic activity and organ masses in mice bred for high-voluntary wheel-running behavior.** Cadney and coauthors tested the effects of early-life fructose and/or wheel exercise in selectively bred high-runner mice as compared to controls. Consistent with previous studies, the authors demonstrate that early-life exercise promoted adult wheel running though there were minimal effects of early-life fructose.

**High-fat diet during pregnancy lowers fetal weight and has a long-lasting adverse effect on brown adipose tissue in the offspring.** Yamaguchi and colleagues fed dams a high-fat diet from embryonic day 2.5, which induced glucose tolerance and hypertension in dams. The offspring of high-fat diet-fed dams had lower fetal body weight, though not altered placental weight, and increased lipid droplet size in brown adipose tissue. These results suggest that high-fat diet consumption during pregnancy exerts long-lasting effect on brown adipose tissue and thermogenesis.

**Effects of uteroplacental insufficiency on cardiac development in growth-restricted newborn rats.** Chou and Chen induced uteroplacental insufficiency with bilateral uterine vessel ligation and examined histopathology and immunochemistry of the lung and heart. Neonates with fetal growth restriction demonstrated hypertrophy and degeneration of cardiomyocytes suggesting inadequate myocardial reserves which may cause subsequent cardiovascular compromise in later life.

**Treatment with topiramate in rats during childhood causes testicular structural impairment at adulthood.** Borges and coauthors expose rats to topiramate, a psychotropic drug for epilepsy, during the early to mid-postnatal period. Topiramate had a significant adverse impact on the rat reproductive system in adulthood indicating the consequence of endocrine disruptor medications.

**Malathion exposure during juvenile and peripubertal periods downregulate androgen receptor and 17 B HSD testicular gene expression and compromise sperm quality in rats.** Erthal and colleague exposed male Wistar rats to malathion during the postnatal period. Malathion downregulated gene expression for androgen receptors and impaired sperm quality and function indicating significant adverse reproductive effects.

**Latent growth analysis of child's height growth trajectories**. Wake and coauthors examine the growth speed in height of children and determinants among 3401 males and 3200 females from lower middle income countries. The authors demonstrated significant inequalities in growth change observed among children, with significant variance between countries.

**Myocardial perfusion and function dichotomy in growth-restricted preterm infants**. Sehgal and coauthors compare coronary artery blood flow and cardiac function in preterm growth-restricted infants to appropriate-for-gestational-age infants during the postnatal period. Growth-restricted infants had higher coronary artery blood flow velocity, but impaired diastolic and systolic function. The authors suggest that this dichotomy may be a persistent response to fetal hypoxia and/or altered cardiac architecture.

**Prenatal trimester-specific intake of micronutrients: Global DNA methylation and hydroxy-methylation at birth and persistence in adulthood**. Parsons and colleagues evaluate the association of maternal trimester-specific intake of micronutrients with global DNA methylation in cord blood and persistence into childhood. The authors demonstrate that trimester-specific nutrients may impact sensitive windows of epigenetic programming with some lasting effects throughout childhood.

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