

# Special Issue on Environmentally Induced Epigenetic Variation during Germ Cell and Embryo Development: a Programming Perspective

## CALL FOR PAPERS

Epigenetics refers to heritable changes in gene function, and in turn in phenotypes, that are not caused by genetic alternations. It involves DNA methylation, histone modifications, and noncoding RNAs that collectively compose the “epigenome” and regulate gene activity. The epigenome orchestrates numerous essential regulatory mechanisms during mammalian development, including cell and tissue differentiation, genomic imprinting, and X chromosome inactivation.

Unlike the genome, the epigenome is dynamic and may modulate genome function under exogenous influence. Recently, interest has grown on how exposure to environmental conditions (e.g., nutritional, hormonal, metabolic, and environmental variations) modulates the establishment and maintenance of epigenetic modifications and thereby influences gene expression and phenotype. While gene-environment interactions are the basis for adaptation and may therefore be beneficial, growing evidence indicates potential risks for the future health of the individual, particularly when epigenetic modifications arise around the time of conception and early embryogenesis.

The Developmental Origins of Health and Disease (DOHaD) hypothesis proposes that fetal environment exerts a profound influence on development, physiology, and risk of disease in adult life. In accordance, the sensitivity of the early embryo to the environment has been associated with postnatal growth and metabolism and this periconceptual “programming” has been demonstrated across animal models and in humans.

Aim of this special issue is to publish high quality research papers as well as review articles addressing the potential mechanisms and implications of environmentally induced epigenetic variation during mammalian germ cell and embryo development, considering a DOHaD perspective. We welcome original high quality contributions that are not yet published or not currently under review by other journals or peer-reviewed conferences.

Potential topics include but are not limited to the following:

- ▶ Variations of epigenome and/or phenotype due to exposure to external factors (i.e., diet, temperature changes, and endocrine disruptors) during gametogenesis and/or conceptus development
- ▶ Molecular and cellular mechanisms involved in epigenetic mediation of exposure-response relationships
- ▶ Effects of assisted reproductive technologies (ART) on the epigenome of gametes and embryos
- ▶ Transgenerational inheritance of environmentally induced epigenetic variation
- ▶ Recent developments in understanding epigenetic reprogramming during gametogenesis and/or embryogenesis (DNA methylation, histone modification, and noncoding RNAs)
- ▶ Effects of environmental cues on genomic imprinting

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/bmri/developmental.biology/eiev/>.

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