

## RESEARCH HIGHLIGHT

## 2019 environment, epigenetics and reproduction

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### Abstract

A conference summary of the fourth 2018 biannual Kenya Africa Conference ‘Environment, Epigenetics and Reproduction’ is provided. A special Environmental Epigenetics issue containing a number of papers in Volume 5, Issue 3 and 4 are discussed.

**Key words:** environment; epigenetics; reproduction; Africa

### Conference Summary

#### Special Issue

This 2019 Special Issue of Environmental Epigenetics is entitled 2019 Environment, Epigenetics and Reproduction. The ability of environmental exposures such as toxicants, nutrition or stress to influence reproduction and adult onset disease is reviewed in these articles within Volume 5 Issue 3 and 4. The papers in Volume 5, Issue 3 include:

- Sadman Sakib, Anna Voigt, Taylor Goldsmith, Ina Dobrinski. Three-dimensional testicular organoids as novel in vitro models of testicular biology and toxicology. (dvz011)
- Malcolm M Moses, Richard R Behringer. A gene regulatory network for Müllerian duct regression. (dvz017)
- Ingrid Sadler-Riggelman, Rachel Klukovich, Eric Nilsson, Daniel Beck, Yeming Xie, Wei Yan, Michael K Skinner. Epigenetic transgenerational inheritance of testis pathology and Sertoli cell epimutations: generational origins of male infertility. (dvz013)

The papers in Volume 5, Issue 4 are:

- Jake Lehle and John R. McCarrey. Differential susceptibility to endocrine disruptor-induced epimutagenesis, (2019–20) (pending)

- Walker C, Ghazisaeidi S, Beyssac L, Boisvert A, Culty M. Transgenerational effects of fetal exposure to low dose Genistein and DEHP mixtures on male rat reproduction: can epigenetics provide answers? (pending)

Generally environmental exposures do not have the ability to promote mutations in DNA sequence, suggesting additional molecular mechanisms such as epigenetics need to be considered. Environmental exposures have been shown to influence epigenetic processes such as DNA methylation, histone modifications, chromatin structure or non-coding RNA. Therefore, environmental epigenetics provides a molecular mechanism for how the environment can influence biology including reproduction. The articles and review included in this Special Issue provide insights into the molecular and physiological aspects of how environmental factors influence reproduction and related adult disease.

#### African Conference

The origins of this Special Issue come from an Africa conference entitled, ‘Environment, Epigenetics and Reproduction’ held August 2018 in Kenya, which is the fourth African conference

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**Figure 1:** 2018 African Conference Group. Richard Behringer, Bruce Blumberg, Dejoie Blumberg, Martine Culty, Ina Dobrinski, Bonnie Dunbar, Terry Hassold, Nathaniel Heintz, Ines Heintz, Pat Hunt, John McCarrey, Jose Luis Millan, Theresa Millan, Vassilios Papadopoulos, Michael Skinner, Deborah Slechta, Thomas Slechta, Amy Slechta, Christina Cool, Tilman Stasch, Wei Yan and Huili Zheng.

on the topic with the first held in March 2011. This conference involved conference sites at the Karen Blixen Coffee Garden and Cottages in Nairobi, the Kilaguni Serena Lodge near Mt Kenya, Karen Blixen Camp, and Island Camp on Lake Baringo. The host was Dr Bonnie Dunbar who was a Professor at Baylor University who did the pioneering work on the oocyte zone pelucida and moved to Kenya years ago and owns the Karen Blixen Coffee Garden and Cottages and Lake Baringo Island Camp Resort. Ms Anjali Devani with Travel Wild, Nairobi arranged the conference logistics in Kenya. Several of the participants have provided the reviews and articles for this Special Issue. A photograph of some participants of the conference is shown in [Figure 1](#). The cover art photographs on this Special Issue were taken by the participants in Kenya during the meeting.

### Summary

World-wide environmental exposures have significant biological impacts and influence pathology for all organisms. Reproduction is often one of the first physiological systems influenced by the environment. Therefore, it is critical to understand how the environment, through molecular mechanisms such as epigenetics, can influence reproductive disease and processes. Several articles in the current Special Issue provide a molecular to physiological level understanding of how the environment can impact reproduction which can be used in the future for novel strategies to improve wildlife and human health and reduce disease.

*Conflict of interest statement.* None.