

## **Investigating the Impact of DEHP on Histone Modification Mechanisms and Male Reproductive Health During Meiosis**

A recent WHO report reveals that about one in six adult individuals face infertility issues globally. There are various reasons for the decline in male fertility, with one significant factor being the excessive use of plastic products in daily life. Di (2-ethylhexyl) phthalate (DEHP) is an endocrine-disrupting chemical which present in a wide range of plastic items, medical devices, and construction materials. Multiple evidence from population-based epidemiological studies suggests a significant association between DEHP and its metabolites with male reproductive disorders, including reduced testosterone levels and diminished semen quality. Previous research has proposed that a part of DEHP toxicity mechanisms includes epigenetic changes, specifically alterations in histone modifications. However, much remains unknown about the histone modification regulatory mechanisms and how endocrine-disrupting chemicals influence the male germline epigenome. In our preliminary study, we developed a mouse line with impaired histone turnover to investigate mechanisms of histone modification alteration during meiosis. This project aims to elucidate the regulatory mechanisms and biological significance of endocrine-disrupting chemicals in influencing epigenetic programming during male meiosis. The current proposal specifically examines the impact of DEHP on histone modification alterations during male meiosis. Based on my preliminary data and the literature in the field, I hypothesize that exposure to the endocrine-disrupting chemical, DEHP, disrupts programmed histone modifications during meiosis. I will employ the mouse line with impaired histone turnover to investigate the underlying mechanism of DEHP-induced histone modification alterations in male meiosis.