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MEETING ABSTRACTS

3R STRATEGIES IN REPRODUCTIVE TOXICOLOGY AND BIOMEDICINE

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Reproductive health is challenged by contemporary lifestyles. Health issues such as menstrual problems, cancers, infertility, and sexual dysfunction have been rising (1-3). For example, nowadays, more than 20% of couples experience infertility problems (1). Recently, a growing piece of evidence supports an association between chemical exposure and reproductive disorders (2,3). Traditionally, animal models have been used to elucidate human reproductive health development, disorders, and pathologies, including mechanistic insight. Reproductive toxicity testing of chemicals for regulatory purposes also relies on them. Therefore, it is vital to address the challenges concerning the use of animal-based models for reproductive toxicology and biomedicine and provide an overview of currently available 3Rs strategies. This talk will acknowledge the urgent need for animal-free models focusing on testes and ovaries, as their proper development and functionality are critical for a lifelong healthy reproductive system and due to their sensitivity to chemicals (2,3), with some specific examples from our current studies. Then, the adverse outcome pathway (AOP) concept will be applied to summarize currently available mechanistic knowledge covering key events at all levels of the biological organization and some potential early biomarkers of reproductive impairments will be proposed. Finally, chemically-induced disruption leading to reproductive disorders and dysfunctions will be discussed.

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Keywords: Adverse outcome pathway, 3Rs; new approach methodologies; reproductive toxicology; reproductive biomedicine

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