DE NOVO MUTATION RATE IN ART IN MICE

Assisted reproductive technologies (ART) are widely used in human fertility treatment, yet their potential impact on genome integrity remains insufficiently understood. Using a rigorously controlled mouse model, Blanco-Berdugo et al. (1) demonstrate that a standard ART protocol induces a ~30% increase in de novo single-nucleotide mutations compared with natural conception. Although the mutational spectra and genomic distribution of variants remain broadly comparable across cohorts, the systematic elevation in mutation rate indicates that the ART environment modestly enhances mutational vulnerability during gametogenesis or very early embryogenesis. This experimental evidence, obtained in an inbred mammalian system under tightly controlled genetic and environmental conditions, highlights a biological mechanism that could be relevant for humans. Given the rapidly increasing global reliance on ART and the fundamental differences between epigenetic and mutational processes, these findings underscore the urgent need to investigate whether similar mutagenic effects occur in human embryos, particularly in the context of ovulation stimulation, culture conditions, and fertilization techniques such as ICSI. While the authors caution that mouse results cannot be directly extrapolated to humans, their work raises an essential question for reproductive medicine: whether ART may subtly shape the human germline mutational load, with possible implications for long-term health of the offspring .

1. https://pubmed.ncbi.nlm.nih.gov/41233158/