**2022 Chemotherapy Paper**

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**Publication**

Thompson RP, Beck D, Nilsson E, Ben Maamar M, Shnorhavorian M, Skinner MK. Examination of generational impacts of adolescent chemotherapy: Ifosfamide and potential for epigenetic transgenerational inheritance.

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**Summary**

The current study was designed to use a rodent model to determine if exposure to the chemotherapy drug ifosfamide during puberty can induce altered phenotypes and disease in the grand-offspring of exposed individuals through epigenetic transgenerational inheritance. Pathologies such as delayed pubertal onset, kidney disease, and multiple pathologies were observed to be significantly more frequent in the F1 generation offspring of ifosfamide lineage females. The F2 generation grand-offspring ifosfamide lineage males had transgenerational pathology phenotypes of early pubertal onset and reduced testis pathology. Reduced levels of anxiety were observed in both males and females in the transgenerational F2 generation grand-offspring. Differential DNA methylated regions (DMRs) in chemotherapy lineage sperm in the F1 and F2 generations were identified. Therefore, chemotherapy exposure impacts pathology susceptibility in subsequent generations. Observations highlight the importance that prior to chemotherapy, individuals need to consider cryopreservation of germ cells as a precautionary measure if they have children.