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Introduction

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DNA Damage & Endoreplication

In mice, endometrial cells undergo endoreplication during decidualization, resulting in polyploidy where the DNA content is higher than a normal diploid cell. Endoreplication can be induced through DNA damaging agents such as Doxorubicin.

DNA Damage Increases Differentiation & Induces Endoreplication in Healthy Cells

A) Doxorubicin treatment increases mRNA expression of differentiation markers, IGFBP1 and Prolactin, shown by q-RT-PCR
B) Doxorubicin increases IGFBP1 protein expression shown by Western Blot
C) Doxorubicin increases the number of polyploid cells and decreases diploid population

Menstrual blood is collected from people with or without endometriosis so the cells can be isolated. These cells will be cultured, differentiated, and treated so their responses can be assessed by Western Blot, q-RT-PCR, FACS, invasion capacity, and clonagenity.

Endometriosis

Retrograde menstruation, where menstrual blood flows out of the fallopian tubes into the body cavity and is the leading hypothesis developed in the 1920s, isn’t sufficient because 80% of menstruators experience this; however, only 10% develop endometriosis. So, what are the physiological differences that lead to the development of this disease?