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PERFLUOROOCCTANOIC ACID (IN THE PRESENCE OF FETAL BOVINE SERUM) INDUCES PROLIFERATION IN ER α POSITIVE AND ER α NEGATIVE BREAST CANCER CELL LINES

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Perfluorooctanoic Acid (in the Presence of Fetal Bovine Serum) Induces Proliferation in ER α Positive and ER α Negative Breast Cancer Cell Lines

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ABSTRACT

Perfluorooctanoic acid (PFOA) is a synthetic chemical belonging to a larger group of fluorotelomers. These compounds have been used in the production of both industrial and consumer products as surfactants and are environmentally persistent pollutants. While the long-term effects of PFOA are largely unknown, there is increasing evidence suggesting it to be an endocrine disruptor. Studies have shown that PFOA binds to and activates peroxisome-proliferator-activated receptor α (PPAR α), which can regulate the expression of other genes and receptors. Previous experiments in our lab demonstrated that PFOA treatment of MCF-7 breast cancer cells (an ER α -positive cell line) decreased expression of ER α mRNA and protein, and decreased cell viability by ~20% within 48h of treatment compared to DMSO controls. However, these cells were treated in the absence of fetal bovine serum (FBS). When we repeated these experiments without serum withdrawal, we initially noted a tendency towards increased proliferation in MCF-7 cells treated with 50 μ M and 100 μ M PFOA at both 24h and 48h compared to control. To further examine the role of ER α in this PFOA-induced proliferation, we carried out additional experiments in MCF-7 cells along with experiments in another ER α -positive cell line, T47D, as well as an ER α -negative cell line, MDA-MB-23.

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