

Maternal Exposure to Organophosphate Flame Retardants Alters Locomotor and Anxiety-Like Behavior in Male and Female Adult Offspring

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Endocrine disrupting compounds (EDC) are compounds found in our environment that interrupt typical endocrine function. A particular group of EDCs are flame-retardants due to their interaction with steroid and nuclear receptors in *in vitro* investigations. Humans are consistently exposed to flame-retardants daily as they are used in everyday items such as plastics, clothing, toys, and electronics. In the past, polybrominated diphenyl ethers have been used, however, since 2004, they have been replaced with organophosphate flame-retardants (OPFR) as the major flame-retardant chemical. The effects of maternal or developmental exposure to OPFR on behavior are currently underexplored. Yet, previous research in rodent models utilizing a commercial flame-retardant mixture containing OPFR reported alterations in anxiety like behavior in the elevated plus maze (EPM). Here we assess anxiety-like behavior in the open field test (OFT), the Light/Dark box (LDB), as well as, the EPM in adult offspring that were maternally exposed to OPFR or oil controls. Outcomes from the OFT and LDB indicate that males and females maternally-exposed to OPFR exhibit altered locomotor activity. Results of the EPM were sex-specific as we did not observe an effect in females; however, effects in males differed depending on treatment condition. Males maternally-exposed to OPFR exhibited an anxiolytic-like phenotype in contrast to their vehicle counterparts. This effect in OPFR-treated males was not due to alterations in locomotor activity. Our research illustrates that there are sex- and treatment-dependent effects of OPFR exposure on locomotor and anxiety-like behaviors in a mouse model.

