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Effects of Polybrominated Diphenyl Ethers (PBDEs) on Neonatal Rat Ventral Prostate Grown in Culture

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The polybrominated diphenyl ethers (PBDEs) are a class of organohalogenated pollutants used as flame-retardants in plastics, electronic equipment and building materials. While human body burdens of some organochlorine compounds (PCBs, PCNs, PCDFs and PCDDs) have been decreasing in the past 20-30 years, levels of the PBDEs have been doubling every 5 years during this time. This has led to growing concern because there is relatively little toxicity data available for the PBDEs compared to other organohalogenated pollutants. Existing data suggests that the PBDEs could be classified as environmental hormones because certain congeners have estrogenic activity and can interfere with thyroid hormone transport. In addition, some PBDEs may act through the Ah receptor. In this study, we investigated the effect of several PBDE congeners on prostate development using neonatal rat ventral prostates grown in organ culture. Ventral prostate were grown for 5 days in medium containing no hormone, 0.5nM testosterone or 0.5nM testosterone in addition to one of twelve PBDE congeners at 10^{-5} , 10^{-7} , 10^{-9} or 10^{-11} M concentrations. Prostate growth was assessed by measuring the area of the explants at the end of the culture period compared to baseline area measurements. Results indicate that the two congeners found in highest levels in humans, PBDE 47 and PBDE 99, did not affect prostate growth at any concentration tested. Several of the other PBDEs did alter prostate development compared to testosterone controls, either increasing (PBDE 30, PBDE 190 and PBDE 153) or inhibiting (PBDE51, T2-HO-PBDE) prostate growth at several concentrations.