21 by intraperitoneal injection as well as subcutaneous treatment, whereas had no effect on preputial separation (PPS). In addition, 10 mg/kg of permethrin elevated serum level of testosterone and increased in testis weight of male rats on PND 49. In the female offspring of PND 22, serum level of E2 was reduced and significant reductions of ovarian ERα mRNA and protein level were showed. In contrast, reproductive organ weights (uterus, vagina and ovary) were increased. Our results demonstrated that in utero exposure of permethrin might alter normal sexual maturation of male and female in rats.

[PA4-20] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Effects of Neonatal Exposure to Di(n-butyl)phthalate on Reproductive Organ Development in Sprague-Dawley Male Rats

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Effects of a xenoestrogen, di(n-butyl)phthalate (DBP), on development of male reproductive organ were investigated using neonate male rats. The aim of present study is for a better understanding of how DBP influences the growth of reproductive organ when neonatally exposed to male rats. Sprague-Dawley neonate male rats were injected by s.c. with corn oil (control), flutamide (0.05, 0.1, and 0.5 mg/animal) and DBP (5, 10, and 20 mg/animal) on days 5-14 after birth. All animals were killed at 31 (immature) and 42 (pubertal) days of age, respectively. Blood was collected for serum testosterone analysis, and then testes and accessory sex organs (epididymis, seminal vesicles, ventral prostate, levator ani plus bulbocavernosus muscle (LABC), cowper's glands) were dissected carefully and weighed. In addition, steroid hormone receptors (AR and ER) expression was examined in the testes and ventral prostate. At 31 days of age, flutamide (0.5 mg/animal) and DBP (20 mg/animal) significantly decreased the weights of ventral prostate, seminal vesicles, LABC, and cowper's glands as compared with those in the control group, but serum testosterone levels were unaffected. Flutamide slightly delayed the testes descent at the high dose (0.5 mg/animal), but DBP did not show any significant effect on the testes descent at all doses. In addition, DBP and flutamide also significantly decreased the expression of AR in the testes, but expression of ER-β is increased in prostate. At the pubertal stage, seminal vesicles, and cowper's glands weights were significantly decreased only at the high dose of flutamide (0.5mg/animal) and DBP (20 mg/animal), whereas the weights of the testes and epididymis were unaffected. Moreover, DBP also markedly decreased serum testosterone levels. In contrast, flutamide also significantly decreased the expression of AR in the testes, but expression of ER-β were similar to control. Based on these results, flutamide and DBP have shown a number of similarities in patterns of reproductive organ development, but some marked differences.

[PA4-21] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Gender-related Difference in Alteration of Acetylcholinesterase Activity of Rats Exposed to Organophosphate Pesticide Terbufos

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An organophosphate pesticide terbufos (S-t-butyl thiomethyl O,O-diethyl phosphorodithioate, TBF) has been extensively used as an insecticide. A sexual dimorphism in the cholinergic innervation between both sexes was reported in certain species. However, a sexual dimorphism in TBF toxicity was not reported and remains unclear. TBF (0.5 mg/kg x 2) was orally administered to both male and female rats (postnatal day 48). The rats were sacrificed at 6, 12, 24 and 72 hr after oral administration. Acetylcholinesterase (AchE) and neuropathy target esterase were determined in the brain and liver tissues and the blood. AchE activity in the frontal cortex was significantly inhibited by 38% in female and 30% in male at only 6 hr after administration. In the entorhinal cortex AchE activity was significantly inhibited by 24-38% in female rats at

6-72 hr with no effect in male rats. In the cerebellum, AchE was significantly inhibited by 20-34% at 6, 12, and 24 hr in female rats and by 9-13% in male rats. In the plasma, AchE was significantly inhibited by 52% at 6 hr, 58% at 12 hr, 30% at 24 hr and 17% at 72 hr after administration, compared to 29% at 6 hr and 33% at 12 hr post-dose in male rat. Neuropathy target esterase activity was significantly decreased at 6 and 24 hr in the entorhinal cortex, and 6 and 12 hr in the liver of male rats. Taken together, TBF treatment results in more vulnerability to female than male rats in brain and blood AchE activity.

[PA4-22] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

The effect of PCBs (polychlorinated biphenyls) on EROD activity in vivo.

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PCBs are wide spread persistent environmental pollutants that exert a broad spectrum of toxic effects. PCBs includes 209 possible congeners differing in extent and position of chlorination of their aromatic rings. In order to understand the toxic mechanism of PCBs, we have tested the effect of PCB on the EROD activity in vivo. Among the AhR gene battery, CYP4501A is a well understood parameter for the potency of AhR agonists. The 7-ethoxyresolufin O-deethylase(EROD) activity of CYP4501A isozyme is widely accepted marker to measure the inducibility of dioxin-like compounds on CYP1A gene expression. The bioaccumulated diortho-chloro-substituted PCB congeners, PCB118(2,3',4,4'5-pentachlorobiphenyl), PCB138 (2,2',3',4,4'5-hexachlorobilhenyl), PCB153 (2,2',4,4',5,5'-hexachlorobilhenyl), PCB180 (2,2'3,4,4'5,5'-heptachlorobiphenyl) and commercial (the technical mixture) PCBs, Aroclor 1254 were treated SD rats and ERDO activity of rat liver microsome was examined. Also in order to evaluate the possible cross talk between these chemicals and estrogen by comparing the effect of a series of diortho-substituted PCB congeners alone treatment and cocomitant treatment with estrogen on CYP1A-catalyzed EROD. As expected, PCBs and Aroclor showed the induction of CYP1A-catalyzed EROD activity in rat liver microsome. Aroclor1254 treatment showed the dose-dependent increase of EROD activity in SD rat liver microsome and the effect of Aroclor1254 was inhibited by E2 concomitant treatment. Also PCBs-induced EROD activity and this stimulatory effect was inhibited by E2 concomitant treatment. In the present study, we demonstrate that PCBs are inducers of CYP1A gene espression and these effects cen be inhibited by estrogen.

Poster Presentations - Field B1. Physiology

[PB1-1] [04/19/2002 (Fri) 10:00 - 13:00 / Hall E]

Effects of Protein Kinase Inhibitors on Melanin Production in B16 Cells Stimulated via cAMP-dependent Pathway

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To investigate the effect of protein kinase on melanin production via cAMP-dependent pathway, we measured the melanin amount and tyrosinase activity in B16 melanoma cells stimulated by alpha-melanocyte stimulating hormone (MSH), forskolin and 8-Br-cAMP. MSH, forskolin and 8-Br-cAMP significantly increased both melanin production and tyrosinase activity in B16 cells. Bisindolmaleimide (1 μ M), protein kinase C inhibitor, significantly inhibited melanin production and tyrosinase activity stimulated by MSH, forskolin and 8-Br-cAMP with the following order of potency: MSH>forskolin>8-Br-cAMP. Tyrosine kinase inhibitor, genistein and DHC, significantly inhibited both, but the inhibitory effect was more potent in 8-Br-cAMP-stimulated B16 cells than MSH-stimulated cells. Both melanin production and tyrosinase