PFNA

In this guide

In vivo toxicity data

NTP, 2022a

189. NTP (2022a) investigated the effects of perfluorononanoic acid (PFNA) on thyroid weight, histopathology and TH levels in rats. In a repeated dose study, SD rats (10/sex/group) were administered PFNA at doses 0, 0.625, 1.25, 2.5, 5 or 10 mg/kg bw/day) for males, or 0, 1.56, 3.12, 6.25, 12.5 or 25 mg/kg bw/day for females by gavage for 28 days. At necropsy on day 29, blood samples were collected for TT4, TT3, FT4, TSH and PFNA analysis, and thyroids were removed for histopathological evaluation.

190. Mortality: In males, all rats died at 10 mg/kg bw/day, and eight rats died at 5 mg/kg bw/day before scheduled necropsy. In females, all rats died at 25 mg/kg bw/day, and nine rats died at 12.5 mg/kg bw/day before scheduled necropsy. General toxicity and body weight: All rats that died before scheduled necropsy were described as thin. In males, terminal body weights were significantly reduced at 1.25 and 2.5 mg/kg bw/day, compared with controls. In

females, terminal body weights were significantly reduced at 3.12 and 6.25 mg/kg bw/day. Data for 5 and 10 mg/kg bw/day (males), or 12.5 mg/kg bw/day and25 mg/kg bw/day (females) are not available due to high mortality.

191. Gross pathology: In males, thyroid weights and relative thyroid weight: body weight were significantly increased at 2.5 mg/kg bw/day, compared with controls. In females, thyroid weights and relative thyroid weight: body weight was unaffected by treatment.

192. Histopathology: Histopathology in males and females was unaffected by treatment.

193. Thyroid hormone levels: In males, TT4 levels were significantly decreased at 0.625 and 1.25 mg/kg bw/day, FT4 levels at ≥ 0.625 mg/kg bw/day, TT3 levels at 2.5 mg/kg bw/day; and TSH levels at 1.25 and 2.5 mg/kg bw/day, compared with controls. In females, TT4 and FT4 levels were significantly decreased at 3.12 and 6.25 mg/kg bw/day. TT3 and TSH levels were unaffected by treatment.

194. Plasma PFNA concentrations: In males, mean plasma PFNA concentrations on day 29 were 0.055 µg/mL (control), 56.730 µg/mL (0.625 mg/kg bw/day), 161.000 µg/mL (1.25 mg/kg bw/day), 380.000 µg/mL (2.5 mg/kg bw/day) and 358.000 µg/mL (5 mg/kg bw/day). In females, mean plasma PFNA concentrations on day 29 were 0.098 µg/mL (control), 26.400 µg/mL (1.56 mg/kg bw/day), 54.360 µg/mL (3.12 mg/kg bw/day) and 112.200 µg/mL (6.25 mg/kg bw/day). Data for 10 mg/kg bw/day (males), and 12.5 or 25 mg/kg bw/day (females) are not available due to high mortality.

195. Overall, TT4 and FT4 were decreased, while TSH was unaffected. There were no histopathologic changes in the thyroid gland.