# Effects of transgenerational endocrine disruptor exposure and in utero high fat diet exposure in males

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Developmental and ancestral exposure to endocrine disrupting chemicals (EDCs) has been shown to alter puberty, fertility and energy balance. Additionally, the increase in obesity prevalence worldwide and the impact of gestational high fat diet (HFD) on metabolic risk in children are rising health concerns. Our project aims at characterizing the effect of transgenerational exposure to a mixture of EDCs combined with gestational HFD. F0 dams were orally exposed to a mixture of 13 EDCs at environmentally relevant doses or to oil (controls), 2 weeks before mating, during gestation and lactation. F2 dams were than exposed to HFD (45%) or a normal diet during gestation and the first week of lactation. Seven F2 dams were exposed in each groups. Data were analyzed using two-way ANOVA.

Gestational exposure to HFD was associated with a significant lower weight in F3 pups between PND10 and PND40 ($p < 0,0001$), this difference disappeared after 2 months of age. This phenotype was not significantly worsened by ancestral exposure to EDCs.

F3 males gestationally exposed to HFD showed significant pubertal delay, characterized by delayed age at balanopreputial separation ($F=43,60$; $p < 0,0001$). The same group presented a significant decrease in testicular weight at P25 ($F=13,69$; $p = 0,0012$) and at 7 months (n= 7/groups, $F=33,99$; $p < 0,0001$), but those effects were not worsened by ancestral exposure to EDCs.

No difference in sperm count, sperm mobility or in diameter of seminiferous tube were measured between the control, HFD or EDC groups at 7 months of age (n=7/group). Transgenerational EDC exposure or gestational HFD, alone or combined, did not affect gonadotropin or testosterone levels compared to control animals.

In conclusion, gestational exposure to HFD impairs postnatal growth and delays pubertal development in male rats but this phenotype does not appear to be worsened by ancestral exposure to EDCs.