**GPR151, a G protein-coupled receptor, is a potential regulator of GnRH neurons**

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**Introduction/Aim:**

Bisphenol A (BPA) is a ubiquitous endocrine disruptor chemical that has been shown to alter pubertal timing. We previously showed that early postnatal exposure to BPA disrupted neuroendocrine sexual maturation in female rat. Early postnatal exposure to 25 ng/kg/d induced delayed maturation of GnRH secretion while accelerated maturation of GnRH secretion was observed after a dose of 5 mg/kg/d. Several hypothalamic genes were affected by these two doses of BPA. GPR151 was the gene most affected by the 2 BPA doses.

GPR151 is an orphan G protein-coupled receptor (GPCR) belonging to the Rhodopsin family. No endogenous or synthetic ligand has been identified. A phylogenetic study based on the sequence and structure of GPCRs indicates that GPR151 has homology with galanin and kisspeptin receptors. GPR151 has been identified in fibres of cholinergic neurons of the habenula projecting to the interpeduncular nucleus in rodents. Our goal is to better understand the role of GPR151 in sexual maturation and reproduction in rodents.

**Methods/Results:**

We identified GPR151 in the terminals of GnRH neurons in the median eminence in male and female rats and mice, **although GPR151 appears to be less expressed in mice than in rats**. In the arcuate nucleus, GPR151 mRNA relative expression increases during pubertal development with significant differences between PND 15 (1.00 ± 0.51) versus PND 25 (3.94 ± 0.49; P < 0.01) and PND 80 (5.32 ± 0.80; P < 0.001) in female rats. Overexpression of GPR151 in immortalized GnRH neurons transfected with an AAV vector induced a significant increase in GnRH release from these cells (3.30 ± 0.06 pg/ml vs 2.00 ± 0.05 pg/ml; P < 0.01; n = 10 per group), indicating a possible role for GPR151 in GnRH release.

**Conclusions:**

Our data indicates that GPR151, an orphan GPCR, is expressed in GnRH neurons and could be involved in the regulation of GnRH release.

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