PFNA in Drinking Water Alters Expression of Reproductive Genes in the Brains of Female Mice

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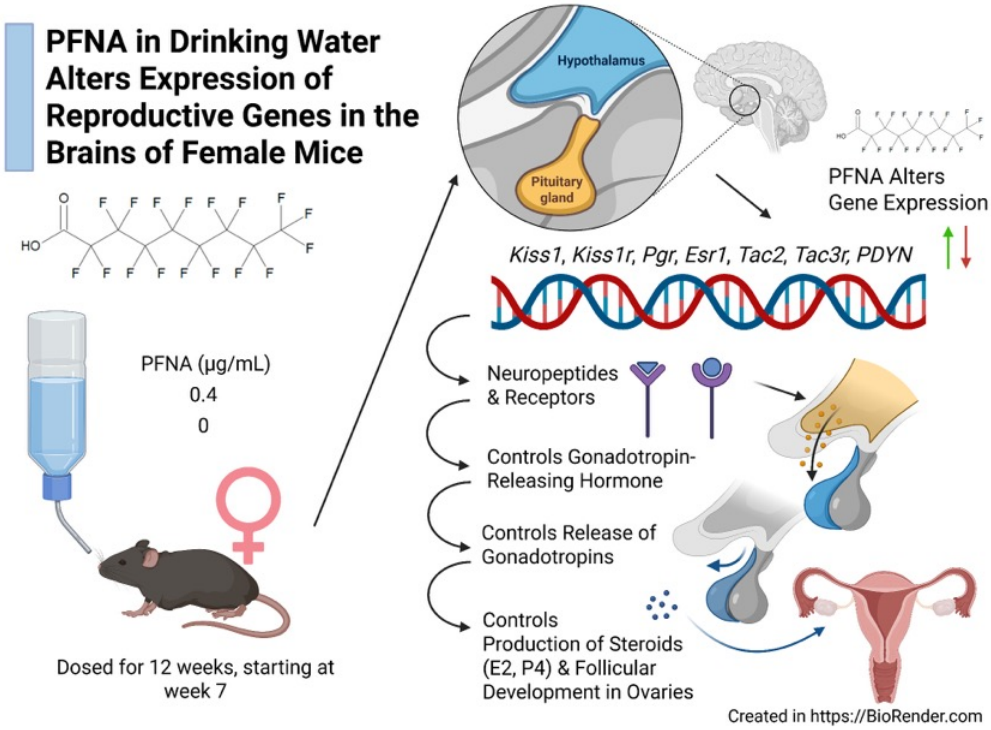
PFAS are a class of chemicals that are a common drinking water contaminant and endocrine disruptor, harming human reproductive health. While well-studied types of PFAS have been revealed to harm human health and have since been phased out of production, understudied PFAS compounds, like PFNA, continue to be found above harmful levels in drinking water, with little known impacts on human health. The genes *Kiss1*, *Kiss1r*, *Pgr*, *Esr1*/ERa, *Tac2/*NkB, *Tac3r,* and *PDYN* act from the arcuate nucleus of the hypothalamus, part of the HPG axis, controlling fundamental reproductive processes like the onset of puberty, the estrus cycle, and pregnancy. It is hypothesized that PFNA will disrupt signaling pathways in the brain, leading to differing levels of expression of these essential genes. This study elucidates the reproductive health impacts of PFNA exposure on women by using a model of female mice exposed to PFNA through drinking water and testing the expression of these reproductive genes in the mouse hypothalamus post exposure. Gene expression is measured through micro-dissecting the arcuate hypothalamus, extracting RNA, assessing RNA quality, and performing quantitative PCR on target genes. We expect the expression of these neuropeptide and receptor genes to differ between the control and exposure groups, allowing us to predict downstream effects of PFNA on reproductive health and through which mechanisms PFNA disrupts the HPG axis, further uncovering the impacts of this drinking water pollutant on women's reproductive health. Supported by NIH R25ES020721, NIEHS CEED P30ES005022, the RISE Program, the Ernest Mario School of Pharmacy, and the Society of Toxicology.