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Bisphenol A (BPA) Increases Expression of Progesterone Receptor (PR) mRNA and Its Protein in the Hypothalamus of Adult Ovariectomized Rats

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We examined the effect of BPA on the expression of PR mRNA and its protein in the hypothalamus of adult ovariectomized rats. Two weeks after ovariectomy, rats were subcutaneously injected with 10 mg BPA or 10 μg 17β-estradiol (E_2) in sesame oil, or with sesame oil alone as a control. Twenty-four h after the injection, the rats were killed and subjected to northern blot and immunocytochemistry. Northern blot showed that injection of E_2 significantly increased PR mRNA levels in the preoptic area (POA) and the mediobasal hypothalamus. We also found that injection of BPA significantly increased PR mRNA levels in the POA. Immunocytochemistry showed that injection of E_2 significantly increased the number of PR-immunoreactive cells in both the POA and the ventromedial hypothalamic nucleus (VMH). In both the POA and the VMH, injection of BPA also significantly increased the number of PR immunoreactive cells.

We suggest that endocrine disrupters alter reproductive functions by affecting the hypothalamus even in adults.