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Review

Role for estradiol in female-typical brain and behavioral sexual differentiation

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Abstract

The importance of estrogens in controlling brain and behavioral sexual differentiation in female rodents is an unresolved issue in the field of behavioral neuroendocrinology. Whereas, the current dogma states that the female brain develops independently of estradiol, many studies have hinted at possible roles of estrogen in female sexual differentiation. Accordingly, it has been proposed that $\hat{\pm}$ -fetoprotein, a fetal plasma protein that binds estrogens with high affinity, has more than a neuroprotective role and specifically delivers estrogens to target brain cells to ensure female differentiation. Here, we review new results obtained in aromatase and $\hat{\pm}$ -fetoprotein knockout mice showing that estrogens can have both feminizing and defeminizing effects on the developing neural mechanisms that control sexual behavior. We propose that the defeminizing action of estradiol normally occurs prenatally in males and is avoided in fetal females

because of the protective actions of I \pm -fetoprotein, whereas the feminizing action of estradiol normally occurs postnatally in genetic females.



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Keywords

Sexual differentiation; Brain; Estrogens; Aromatase; I \pm -Fetoprotein; Sexual behavior

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