Sexually dimorphic gene expression in mouse brain precedes gonadal differentiation.

Abstract

The classic view of brain sexual differentiation and behavior is that gonadal steroid hormones act directly to promote sex differences in neural and behavioral development. In particular, the actions of testosterone and its metabolites induce a masculine pattern of brain development, while inhibiting feminine neural and behavioral patterns of differentiation. However, recent evidence indicates that gonadal hormones may not solely be responsible for sex differences in brain development and behavior between males and females. Here we examine an alternative hypothesis that genes, by directly inducing sexually dimorphic patterns of neural development, can influence the sexual differences between male and female brains. Using microarrays and RT-PCR, we have detected over 50 candidate genes for differential sex expression, and confirmed at least seven murine genes which show differential expression between the developing brains of male and female mice at stage 10.5 days post coitum (dpc), before any gonadal hormone action.
male and female mice at stage 10.5 days post coitum (dpc), before any gonadal hormone influence. The identification of genes differentially expressed between male and female brains prior to gonadal formation suggests that genetic factors may have roles in influencing brain sexual differentiation.

Development and regeneration, Developmental genetics

Keywords

Brain sexual development; Microarray; Sex differences

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