

## Expression and distribution of aromatase (P450AROM) in selected areas of the developing human brain

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Steroids play a crucial role in brain differentiation. In the hypothalamus aromatase (P450AROM), the enzyme responsible for the conversion of testosterone (T) into 17- $\beta$  estradiol (E2), modulates the mechanisms involved in sexual brain differentiation resulting in differences in specific hypothalamic nuclei between male and female. Recent findings indicate that local E2 synthesis has an impact on other brain areas including the hippocampus, temporal cortex and cerebellum, and may thus influence also cognitive functions.

The expression and the distribution of P450AROM has been described throughout ontogenesis and postnatal development of the central nervous system in several mammalian species, including man. Immunohistochemical studies have localized P450AROM in pyramidal neurons, interneurons and astrocytes of human adult temporal cortex. However the cellular distribution of P450AROM has not been thoroughly investigated in fetal/early postnatal human brains. In this study we report the expression, distribution and cellular localization of P450AROM in selected areas (periventricular zones, cortical areas, cerebellum) of some fetal human brains of the second trimester and a few postnatal individuals. In the fetal individuals, P450AROM expression was scarce and limited to groups of cells mostly localized in the neuroepithelium of the subventricular zones, whereas in the neonatal/early postnatal individuals immunoreactive cells were present also in the cortical columns and in the cerebellar Purkinje layer. The enzyme was localized in the cytoplasm and in the fine extensions of the neural cells. Double labeling and confocal analysis using the Glial Fibrillary Acidic Protein (GFAP) indicated that P450AROM was expressed in cortical astrocytes of early postnatal individuals.

Our data suggest a possible role for this enzyme in the control of neural development and differentiation since the second trimester of gestation.

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