

Regulation of Tyrosine Hydroxylase Expression

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Applications:

Gene Expression, CNS

Nurr1 polypeptide upregulates tyrosine hydroxylase activity and promotes expression of DOPA, norepinephrine and epinephrine.

The invention describes methods to regulate tyrosine hydroxylase expression and the treatment of catecholamine-related diseases including Parkinson's disease, manic depression and schizophrenia. The basis for the invention is the discovery that expression of Nurr1 polypeptide induces tyrosine hydroxylase in both undifferentiated and differentiated mammalian cells including adult hippocampal progenitor cells. Specifically, the invention provides cells that contain exogenous nucleic acid as well as methods and materials for inducing tyrosine hydroxylase expression, treating catecholamine-related deficiencies and identifying tyrosine hydroxylase-related deficiencies. Neural progenitor cells, neural cells and neural stem cells which contain the exogenous nucleic acid and express the Nurr1 polypeptide are upregulated for tyrosine hydroxylase activity and thus promote the expression of DOPA, norepinephrine and epinephrine. These cells can be used to treat catecholamine deficiency diseases directly. In addition, these diseases can be treated by transfection using the genetic construct for Nurr1 expression.

References:

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