

DISTRIBUTION OF D1-D5 DOPAMINE RECEPTOR mRNA IN MOUSE SPINAL CORD

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The hypothalamic A11 region provides the only dopaminergic projection system to spinal cord. These projections are highly collateralized and distribute diffusely through most of the spinal neuraxis (Holstege et al, 1996, J Comp Neurol). While dopaminergic actions have been reported in spinal cord, an identification of spinal dopamine receptor subtypes and their distribution is largely unknown (however for D₂, see van Dijken et al, 1996, Eur J Neurosci). Here, we used *in situ* probes for D₁, D₂, D₃, D₄ and D₅ receptors to examine their expression in adult C57BL/6 mouse lower thoracic and lumbar spinal cord.

Non-radioactive, single stranded digoxigenin-labeled cRNA antisense and sense probes were transcribed *in vitro* using T7 and Sp6 RNA polymerase (Promega). The sequences used are as follows: D₁ receptor 980-1480bp (GeneBank#NM_010076), 501bp product; D₂ receptor 956-1354bp (GenBank #X55674), 399 bp product; D₃ receptor 174-560bp (GenBank #X67274), 387 bp product; D₄ receptor 460-960bp (GenBank #NM_007878), 501 bp product; D₅ receptor 523-944bp (GenBank #NM_013503), 422 bp product. Hybridization was carried out at 68C overnight with 4mg/ml digoxigenin-labeled antisense or sense cRNA probes for all receptors simultaneously.

Evidence for expression of all dopamine receptor subtypes was observed. However, D₁ receptor expression was very weak and D₃ and D₄ receptor expression was strongest. The distribution of all receptor subtypes was similar with greatest somatic labeling observed in the superficial dorsal horn, lamina X, intermediolateral nucleus and motoneurons. This density distribution is consistent with a relatively greater density of dopaminergic axon collaterals to these regions (Holstege et al, 1996, J Comp Neurol).

The broad expression of all dopamine receptor subtypes in spinal cord supports a role for widespread hypothalamic dopaminergic modulatory actions in spinal sensory, autonomic and motor function.

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