A splice variant of the neurotrophin receptor trkB with increased specificity for brain-derived neurotrophic factor

Author(s) Strohmaier, C; Carter, B D; Urfer, R; Barde, Y A; Dechant, G
Author(s) at UniBasel Barde, Yves-Alain ;
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The trkB gene codes for a receptor tyrosine kinase, which is essential for the development of the peripheral nervous system. This receptor can be activated by three different neurotrophins: BDNF, NT-4/5 and NT-3. The extracellular domain of trkB was found to be encoded in 10 exons corresponding to receptor subdomains previously identified on the basis of protein sequence comparisons. Exon 9 was skipped in a novel tyrosine kinase transcript of the trkB gene, designated ctrkB-Short (ctrkB-S). While the previously described trkB receptor ctrkB-Long (ctrkB-L) and trkB-S receptors were activated similarly by BDNF, trkB-S interacted poorly with NT-4/5 and NT-3 as measured by ligand binding, ligand-induced autophosphorylation and ligand-dependent activation of p21ras. Efficient activation of ctrkB-S by NT-3 was restored by a single amino acid replacement in NT-3 (D15A). Both trkB-L and trkB-S transcripts were detected in embryonic neurons.
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