

Display Settings: Abstract

Brain Res. 1996 Oct 28;738(1):32-8.

Neuronatin mRNA in PC12 cells: downregulation by nerve growth factor.

Joseph R, Tsang W, Dou D, Nelson K, Edvardsen K.

Department of Neurology/K-11, Henry Ford Health Sciences Center, Detroit, MI 48202, USA.

Abstract

Neuronatin was recently cloned from neonatal rat brain (*Biochem, Biophys. Res. Commun.*, 201 (1994) 1227-1234). In subsequent studies, we noted **neuronatin** mRNA was brain-specific and that there were two alternatively spliced forms, alpha and beta (*Brain Res.*, 690 (1995) 92-98). Furthermore, on sequencing the human **neuronatin** gene, it was determined that the alpha-form was encoded by three exons, and the beta-form was encoded by the first and third exons only (*Genomics*, 33 (1996) 292-297). The middle exon was spliced out in the beta-form. The human **neuronatin** gene is located in single copy of chromosome 20q 11.2-12 (*Brain Res.*, 723 (1996) 8-22). These studies called for an understanding of the function of this gene. Therefore, we studied the expression of **neuronatin** in PC12 cells, an established model of neuronal growth and differentiation. **Neuronatin** mRNA expression was found to be abundant in undifferentiated PC12 cells. Treatment with nerve growth factor (NGF), resulting in neuronal differentiation, was associated with a downregulation of **neuronatin** mRNA expression. Removal of NGF was associated with a return of **neuronatin** mRNA levels towards baseline. These effects appear to be specific for NGF as they were not seen with transforming growth factor, epidermal growth factor, 12-O-tetradecanoylphorbol-13-acetate or dexamethasone. Although, basic fibroblast growth factor also reduced **neuronatin** mRNA levels, the effect was less pronounced than with NGF. The NGF-induced decreased in **neuronatin** mRNA occurred even in the presence of protein and RNA syntheses inhibitors. Of the two spliced forms, only the alpha-form was expressed in PC12 cells. In conclusion, we report the presence of **neuronatin** mRNA in PC12 cells, and that NGF downregulates its expressions. These findings provide a basis for investigating the role of **neuronatin** in neuronal growth and differentiation.

PMID: 8949924 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances, Grant Support

LinkOut - more resources