P26

Promoter analysis of the human GM3 synthase (hST3Gal V) gene in human neuroblastoma SK-N-MC and hepatoma HepG2 cells

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To characterize the region regulating the transcription activity of the human GM3 synthase (hST3Gal V), hST3Gal V promoter fragments containing varying lengths of 5′-flanking sequence were generated by LA-PCR and inserted into pCAT3-Basic plasmid, resulting in a series of 5′-deletion constructs. Analysis of promoter activity showed that transcription activity of pCAT-1600 in SK-N-MC cells was 3-fold higher than that in HepG2 cells, suggesting a cell-specific manner of hST3Gal V promoter. In SK-N-MC cells, deletion from 1600 to 1210 resulted in about 34% decrease in transcription activity compared to pCAT-1600. Further deletion downstream to base -432 caused a gradual decrease of the promoter activity. However, deletion in the region from 432 to 177 resulted in increase of transcription activity, while deletion in the region from 177 to 83 markedly reduced transcription activity to the level of the promoterless and enhancerless control vector pCAT3-Basic. These results suggest that potential positive regulatory elements exist within the -1600 to -432 and -177 to -83 region, while potential negative regulatory elements exist within the -432 to -177.

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