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Transcriptional activity of the human GM3 synthase (hST3Gal V) gene during the monocytic differentiation of HL-60 cells induced by PMA

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It is known that the activity of human GM3 synthase (hST3Gal V) and the synthesis of GM3 ganglioside are preferentially enhanced during the differentiation of human promyelocytic leukemia HL-60 cells into a monocyte/macrophage lineage induced by TPA. To elucidate molecular basis of hSt3Gal V gene expression during HL-60 differentiation induced with PMA, transcriptional activity of hST3Gal V promoter was examed by using luciferase assay. After 24 h treatment with PMA, morphological change of monocytic differentiation of HL-60 cells was observed and transcriptional activity of hST3Gal V promoter simultaneously increased. Functional analysis of the hST3Gal V promoter region revealed that the -177 to -83 region is important for transcriptional activity of the hST3Gal V gene during HL-60 cell differentiation induced with PMA. This region contains the CREB binding element. Sited-directed mutagenesis of CREB site resulted in remarkable reduction by the same level as control in promoter activity. These results suggest that CREB plays a critical role in the transcriptional regulation of the hST3GalV gene during HL-60 cell differentiation induced with PMA.

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