SI-2-4

Effect of Human Immunodeficiency Virus Type 1 Nef Protein on T-cell activation

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T-cell activation is known to be required for HIV replication in vivo. Stable transformation of the Jurkat T-cell line have been obtained that express the wild type(NL43) and mutant(G2A) type 1 human immunodeficiency virus nef gene. When these transformants were treated with phorbol 12-myristate 13-acetate(PMA) plus phytohemagglutinin(PHA), there was no difference in the level of IL-2 generation, which is the most stringent indicator of an activated T-cell, between the cells expressing NL43 and G2A. However, NL43Nef protein enhanced the IL-2 production compared to G2A Nef when stimulated with anti-CD3 and anti-CD28. This enhancement was due to the increase in activities of transcription factors NFkB and NFAT. Therefore, the Nef protein may increase the T-cell activation by up-regulating the NFkB and NFAT through T-cell receptor-CD3 and CD28 dependent signal transduction pathway.

SI-3-1

Action of DnaA and IciA Proteins on the *dnaA* Promoter of *E. coli*

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The *Escherichia coli* replication initiator DnaA protein is required for initiation of chromosomal replication and represses its own transcription from two *dnaA* promoters 1P and 2P. In contrast, the *in vitro* chromosomal replication inhibitory protein IciA activates transcription from the *dnaA* promoter 1P. We report on the mechanism of regulation of dnaA gene by DnaA and IciA proteins. Sequence specific binding of DnaA protein to the DnaA box results in subsequent oligomerization of DnaA protein to the *dnaA* promoter and inhibition of RNA polymerase binding to both promoters. These results suggest that the extent of oligomerization of DnaA proteins over two *dnaA* promoters contributes to the autoregulation of expression of *dnaA* gene. To activate transcription from *dnaA* promoter 1P, the binding of two dimers of IciA protein facilitate the binding of RNA polymerase to the promoter 1P. Under the condition that two *dnaA* promoters were bound and repressed by DnaA protein, the interaction of RNA polymerase with IciA protein dissociated the oligomerized DnaA proteins on the promoter 1P and activated transcription. Also, we report on the role of DnaA and IciA protein on the expression of nrd gene encoding ribonucleoside diphosphate reductase, which is essential for the synthesis of DNA.