

Involvement of cAMP in the Regulation of the Glyoxylate Bypass in *Corynebacterium glutamicum*

KIM Hyung-Joon and LEE Heung-Shick*

Graduate school of Biotechnology, Korea University, Seoul 136-701, Korea.

In the course of studying the regulatory mechanism of the glyoxylate bypass, we found the *glxR* gene which exert regulatory effects on the bypass by the availability of carbon sources. The predicted amino acid sequence contained a cAMP-binding motif and showed homology to the CRP-family of proteins. Like CRP, as determined by EMSA, the binding activity of GlxR to *aceB* promoter region was dependent on the presence of cAMP which appeared as the modulator for the GlxR protein. Quantitative assay for intracellular cAMP showed that the concentration of the molecule was changed by the availability of carbon sources and growth phase, suggesting the role of cAMP as the signaling molecule. In contrary to the enteric bacteria, the concentration of cAMP was kept high when the cells were grown on glucose. As determined by Western blot analysis and CAT fusion assays, the expression of the *glxR* gene appeared to be constitutive and the level of expression from the gene was not affected by the carbon sources supplied. These results indicate that the GlxR might act as a repressor for the glyoxylate bypass genes in response to the cellular cAMP level which reflects the cellular carbon status.