F319 Molecular cloning of the hisIG gene from Corynebacterium glutamicum

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The hisG and hisI genes, encoding for ATP-phospho-ribosyltransferase and phosphoribosyl-AMP-cyclohydrolase were isolated from Corynebacterium glutamicum gene library by complementation of an Escherichia coli his mutant. Complementation and restriction analysis

showed that recombinant plasmid containing 9 kb fragment com-plementing the E. coli hisG mutant containing other histidine biosynthetic gene, hisI, within the cloned DNA fragment. We determined thenucleotide sequences of the fragment containing hisG and hisI genes. The coding regions of the hisG and hisI genes are 279 and 87 amino acids in length with a predicted size of about 30 and 10 kDa, respectively. Computer analysis also revealed that the nucleotide sequence of the hisG and I gene had a high similarity to that of Mycobacterium tubeculosis and Mycobacterium leprae.

F320 A Histidine Protein Kinase in Sporulation of *Myxococcus xanthus*

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The *csgA* gene encodes a cell surface protein that initiates C-signaling during fruiting body development of *Myxococcus xanthus*. The *csgA* suppressor allele, *socD500* (formerly *soc-500*) restores sporulation to *csgA* cells. The *soc-500* allele eliminates the three basic developmental requirements, starvation, high cell density and a solid surface. Only sporulation, not accompanied with fruiting body formation is induced simply by shifting the temperature of vegetatively growing cells from 32°C to 15°C. Thin sections of *socD500* spores induced by temperature shift contain at least four spore layers and resemble wild type fruiting body myxospores in their impearmeability to the embeding resin. DNA sequence analysis of *socD* reavealed one protein-coding region predicted to encode a 61.6 kDa histidine protein kinase of the type found in sensor-regulator two component system. The *socD500* allele contained two amino acid substitutions, Y169N and K224E, in the putative signal-sensing domain. Attempts to disrupt the *socD* gene were unsuccessful, suggesting that SocD is essential for vegetative growth. I proposed that SocD completes a critical step in the decision to initiate sporulation.