Location of the Gene (ndk) for Nucleoside Diphosphate Kinase on the Physical Map of the Escherichia coli Chromosome

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Nucleoside diphosphate kinase is essential to maintain the cellular concentrations of all nucleoside triphosphates and deoxynucleoside triphosphates at functional levels (3). The gene (ndk) for this enzyme from *Mycobacterium xanthus* has been cloned, and its DNA sequence has been determined (8, 9). A genetic experiment indicated that the ndk gene is essential for cell growth of *M. xanthus* (8, 9). Recently the ndk genes from various eukaryotes (*Dictyostelium discoideum*, [7], rat [5], mouse [12], human [12], and *Drosophila* [2]) have also been cloned and sequenced. These nucleoside diphosphate kinases from different sources show substantial sequence similarities (2). From this consensus sequence, oligonucleotide primers were synthesized. On the basis of the fact that the ndk gene is located near hisS in *Salmonella typhimurium* (11), phase DNAs from 8E3 (phase 427), 2D5 (phase 428), 7F8 (phase 429), 5E10 (phase 430), 6F10 (phase 431), and 8E12 (phase 432) of the Kohara genomic lambda library were used in the polymerase chain reaction (13). Phages 428 and 429 gave rise to a DNA band, the sequence of which matched the consensus sequence of nucleoside diphosphate kinases. By using this DNA fragment, the ndk gene was cloned and sequenced (4). The identity of the predicted gene product as *Escherichia coli* nucleoside diphosphate kinase was confirmed by comparison of the N-terminal sequence with that determined by direct sequencing of the purified protein (10). Nucleoside diphosphate kinase of *E. coli* was found to consist of 143 amino acid residues, having 56% identity with that from *M. xanthus*. The exact position of the gene on the Kohara map (6) was determined to be at 2646 to 2646.5 kb with the transcriptional direction from right to left (Fig. 1). Thus, the ndk gene is located at 54.2 min on the *E. coli* genetic map near other genes for GTP-binding proteins, *lepA* and *era*, mapped at 55.4 min (1).

**ACKNOWLEDGMENTS**

This work was supported by Public Health Service grants GM26843 (to S.I.) and GM19043 (to M.I.) from the National Institutes of Health.

**REFERENCES**


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