Kluyveromyces lactis glyceraldehyde-3-phosphate dehydrogenase and alcohol dehydrogenase-1 genes are linked and divergently transcribed

Jeffrey R.Shuster
Chiron Corporation, 4560 Horton Street, Emeryville, CA 94608, USA

Submitted June 4, 1990 EMBL accession no. X52871

A *Kluyveromyces lactis* glyceraldehyde-3-phosphate dehydrogenase gene sequence, kl*GAP1*, has been found on the same DNA fragment as the *K. lactis* kl*ADH1* gene (1). DNA sequence and polyA-mRNA primer extension analyses show that the two genes are divergently transcribed and there are approximately 1.2 kb of DNA between them. A number of DNA sequences in common within the promoter elements of these two genes (underlined below) have been observed. This genome organization, not usually observed for two glycolytic genes, suggests the possibility of coordinate regulation by a single upstream activation site. The sequence of the kl*GAP1* gene is presented below, the mRNA start (−92) is shown in bold italic.

REFERENCE

1. Saliola,M., Shuster,J.R. and Falcone,C. (1990) *Yeast* **6**, 193−204.

```
ATTACATTATAATATGTACTAGTGTGGTTATTGGTAATTGTACTTAATTTTGATATATAAAGGGTG
GATCTTTTTCATTTTGAATCAGAATTGGAATTGCAACTTGTCTCTTGTCACTATTACTTAATAGTA
ATTATATTTCTTATTAACCTTTTTTTTAAGTCAAAACACCAAGGACAAGAACTACTCTTCAAAGGT
ATTTCAAGTTATCATACGTCTCACACACGCTTCACAGTTTCAAGTAAAAAAAAAGAATATTACACA

MetValLysValAlaIleAsnGlyPheGlyArgIleGlyArgLeuValLeuArgIleAlaLeuGln
ATGGTTAAGGTTGCTATTAACGGGTTTGGTAGAATCGGTAGATTGGTTTTGAGAATTGCTTTGCAA
ArgLysAlaLeuGluValValAlaValAsnAspProPheIleSerValAspTyrAlaAlaTyrMet
AGAAAGGCTCTAGAAGTTGTTGCCGTTAACGATCCATTCATTTCTGTTGATTATGCCGCTTACATG
PheLysTyrAspSerThrHisGlyArgTyrLysGlyGluValThrThrSerGlyAsnAspLeuVal
TTCAAGTACGATTCCACCCATGGTAGATACAAGGGTGAAGTTACTACCAGCGGTAACGACTTGGTC
IleAspGlyHisLysIleAlaValPheGlnGluLysAspProAlaAsnLeuProTrpGlyLysLeu
ATTGACGGTCACAAGATTGCTGTTTTCCAAGAAAAGGATCCAGCTAACTTGCCATGGGGTAAGCTA
GlyValAspIleValIleAspSerThrGlyValPheLysGluLeuAspSerAlaGlnLysHisLeu
GGTGTCGATATCGTTATCGACTCTACTGGTGTCTTCAAGGAATTGGACTCCGCTCAAAAGCATCTA
AspAlaGlyAlaLysLysValValIleThrAlaProSerLysThrAlaProMetPheValValGly
GACGCTGGTGCCAAGAAGGTCGTCATCACTGCTCCTTCCAAGACTGCTCCAATGTTTGTCGTTGGT
ValAsnGluAspLysTyrAsnGlyGluThrIleValSerAsnAlaSerCysThrThrAsnCysLeu
GTTAACGAAGACAAGTACAACGGTGAAACCATTGTTTCTAACGCTTCTTGTACTACCAACTGTTTG
AlaProIleAlaLysIleIleAsnAspGluPheGlyIleAspGluAlaLeuMetThrThrValHis
GCTCCAATTGCTAAGATTATCAACGATGAATTCGGTATTGACGAAGCTTTGATGACTACCGTTCAT
SerIleThrAlaThrGlnLysThrValAspGlyProSerHisLysAspTrpArgGlyGlyArgThr
TCCATCACTGCTACTCAAAAGACTGTTGATGGTCCATCCCACAAGGACTGGAGAGGTGGTAGAACT
AlaSerGlyAsnIleIleProSerSerThrGlyAlaAlaLysAlaValGlyLysValLeuProGlu
GCTTCCGGTAACATTATCCCATCCTCTACTGGTGCTGCTAAGGCTGTCGGTAAAGTCTTGCCAGAA
LeuGlnGlyLysLeuThrGlyMetAlaPheArgValProThrValAspValSerValValAspLeu
TTGCAAGGTAAATTGACCGGTATGGCTTTCAGAGTCCCAACCGTCGATGTTTCTGTCGTTGATTTG
ThrValLysLeuAlaLysGluAlaThrTyrAspGluIleLysAlaAlaValLysLysAlaSerGln
ACCGTCAAGTTGGCTAAGGAAGCCACTTACGATGAAATCAAGGCCGCTGTTAAGAAGGCTTCTCAA
GlyLysLeuLysAsnValValGlyTyrThrGluAspSerValValSerSerAspPheLeuGlyAsp
GGTAAGCTAAAGAATGTTGTTGGTTACACTGAAGACTCTGTTGTTTCCAGCGATTTCCTTGGTGAC
ThrHisSerThrIlePheAspAlaSerAlaGlyIleGlnLeuSerProLysPheValLysValVal
ACTCACTCCACCATCTTTGACGCCTCTGCTGGTATTCAATTGTCTCCAAAGTTCGTCAAGGTTGTT
AlaTrpTyrAspAsnGluTyrGlyTyrSerGluArgValValAspLeuValGluHisValAla *
GCTTGGTACGATAACGAATACGGTTACTCTGAAAGAGTTGTCGATTTGGTTGAGCACGTTGCTTAA
ATTACTCTTTTAAGTTAACGAACGCTTTTGATGAGACTAACG
```