Sequence analysis of a yeast genomic DNA fragment sharing homology with the human c-myc gene

Jacob Sarid and Philip Leder¹

Department of Genetics, Harvard Medical School and ¹The Howard Hughes Medical Institute, Boston, MA 02115, USA
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Sequence conservation is a characteristic feature of certain oncogenes. We report here the analysis of the sequence of a genomic DNA fragment cloned from Saccharomyces cerevisiae, using as a probe a human c-myc cDNA fragment containing the second and third conserved myc "boxes" of c-myc first coding exon (1-3). The yeast sequence has a region of striking homology to a sequence found at c-myc (Fig. 1). Out of three possible translational reading frames in the same orientation as that of c-myc (when correlated to the DNA homology), there is only one ORF that covers the whole 266 bp of the yeast sequence. A stretch of six putative amino acids in this ORF is identical to an amino acid sequence of c-myc in the region of the DNA homology (Fig. 1), but is not in one of the myc Although the yeast DNA fragment hybridizes to a RNA band when used as a probe under stringent conditions against a yeast Northern blot (data not shown) and so is a part of a transcription unit, there is not enough evidence to prove that it is a true homolog of c-myc.

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GGTACCACCCCAAGTAGACATGGCACCATTAGATTCACCACCCGACGCCCAAGTGGATGC
...V P P Q V D M A P L D S P P D A Q V D A
Yeast
Yeast
      Yeast
Yeast
      Yeast
Yeast
                    ... CCCGAGCCCCTGGTGCTCCATGAGGAGACACCGCCCACCACC
Human
       TCCATTACCTTGGCCACCCCAAGTGGAAGCACCACCCCATGAGGAGACACCGCC.ACCACC
       PLPWPPQVEAPPHEETPP
Yeast
                   ...P E P L V L H E E T P
Human
       AGCAGCGACTCTG/End of c-myc first coding exon
Human
       PVUII
TGAGCCTCCATGCGCATTTACAGCTG 266
Yeast
Yeast
           PCAFTA..
       S S D S E/End of c-myc first coding exon
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Fig. 1. DNA sequence and an ORF of the yeast genomic DNA fragment and its region of homology to human c-myc.

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