

Nucleotide sequence of the mouse U7 snRNA gene

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The minor snRNA, U7, is an integral part of the processing machinery required for the generation of the 3' ends of replication-dependent histone mRNAs (1).

Using an oligonucleotide probe complementary to residues 3–44 of the mouse U7 snRNA sequence (2, 3) to screen a λ Charon 35 mouse genomic library, we have isolated a genomic clone (λ MU7) containing a single U7 snRNA gene (Fig. 1a). The 3.0 Kb HindIII/BamHI fragment was subcloned into BSKS+ and –, a set of nested deletions generated from both, and the complete nucleotide sequence determined along both strands using dideoxy methodology. The sequence data revealed the presence of a single U7 snRNA gene. Sequence comparisons indicate that the coding region differs minimally from the published mouse U7 RNA sequences (2, 3). Firstly, nucleotide 59 is a C rather than a G (cf. 2) and secondly, the final nucleotide is a T residue (cf. 3); these minor sequence differences probably result from polymorphisms between individual mice and mouse cell lines. An analysis of the flanking sequences indicate that the structure of this minor snRNA gene resembles that of the vertebrate major snRNA genes, with good matches to the distal sequence element (DSE), proximal sequence element (PSE) and 3' signal consensus sequences, as well as a similar spatial arrangement of these elements with respect to the coding region (Fig. 1b) (4).

Genomic Southern blots, using both the oligonucleotide and mouse U7 snRNA gene as hybridisation probes, suggest that the mouse genome only contains 1 true U7 snRNA gene (Fig. 2); the corresponding genomic restriction map matching that of λ MU7 (Fig. 1a). Under low stringency conditions with both probes, a maximum of 3 additional hybridising sequences were detected, these are believed to be U7 snRNA sequence variants and/or pseudogenes.

The functionality of this gene has been confirmed by *Xenopus* oocyte microinjection and S1 nuclease mapping, the resultant transcript having the same 5' and 3' termini as the mouse U7 snRNA.

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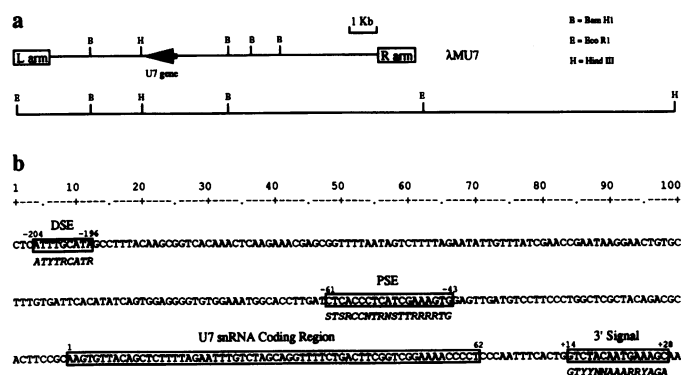


Figure 1. a) λ MU7 and genomic restriction maps. b) Nucleotide sequence of the mouse U7 snRNA gene. The consensus sequences of the vertebrate major snRNA gene transcription elements are shown below (in italics) for comparison.

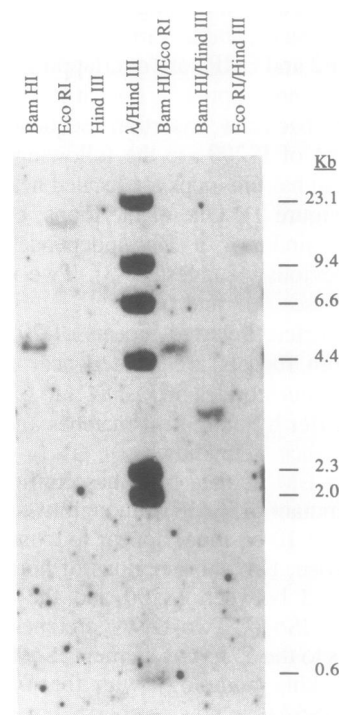


Figure 2. Mouse genomic Southern blot using the U7 snRNA gene probe.

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