
Identification and DNA sequence of an interspersed repetitive DNA element in the genome of the miniature swine

Dinah S.Singer, Leslie J.Parent and Rachel Ehrlich

Immunology Branch, NIH, Bethesda, MD 20892, USA and Howard Hughes Medical Institute

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A new repetitive DNA element has been identified, in the genome of the miniature swine. From analysis of total genomic DNA and screening of genomic libraries, it is estimated that there are between 50-100,000 copies of this DNA sequence element and that they are interspersed throughout the genome. Nine members of this repetitive family have been isolated in association with three class I MHC genes. One of the elements occurred inserted in an intron, generating flanking short direct repeats; it was not found in the homologous intron of other swine class I genes. From DNA sequence analysis of these elements a consensus sequence has been derived, named PRE-1. The 233 bp PRE-1 sequence, given below, contains an RNA polymerase III split promoter (16-27 bp and 58-69 bp) as well as two short direct repeats (91-124 bp and 138-170 bp). The 3' termini of the elements consist of a poly A tail of variable length. Although the class I MHC genes of the miniature swine are highly homologous with class I MHC genes from other species (1), neither the consensus PRE-1 nor any of the individual elements have any sequence homology to DNA sequences from other species, including known repetitive DNA elements. PRE-1 elements isolated in association with the same class I gene are no more related to one another than to repeats associated with other class I genes. Hybridization of the repeat element to either human or mouse DNA revealed no homologous sequences. Thus, PRE-1 appears to have propagated throughout the genome following speciation. Although none of the members of the PRE-1 family contains an open reading frame, they are transcribed in pig liver and thymus; other tissues have not been examined. Thus, it is speculated that PRE-1 may be a transposable element, similar to the Alu sequence of monkey (2), which is propagated by reverse transcription and insertion.

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AGG GAG TTC CCA TCG TGG CT CAG TGG TAA CGA ACC TGA CTAG TAT CCA TGA GGA TGC AGA TTCA ATCC CT
GG CCT TNC TCA GTGG GTT AAG GAT CCG CATT GCT GTG AGN TGT GGT GTAG GT CNC AGA TCG CGG CT CGGA
TCC CGT GTT GCT GTGG CTGT GGT GTAG GCGG CAG CTAC AGCT CCG ATT NAC CCC CTAG CCT GGG AAC CT
CC ATAT GCC CGG GGT N GGC CCT (A)n

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1. Satz, M.L., Wang, L., Singer, D. and Rudikoff, S (1985). *J. Immunology* **135**, 2167-2175.
2. Grimaldi, G. and Singer, M. (1982) *Proc. Natl. Acad. Sci.* **79**, 1497-1500.