A TaqI restriction fragment length polymorphism at the Hox-2.1 locus cosegregates with the D1b-1 locus on mouse chromosome 11

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SOURCE/DESCRIPTION:

The plasmid, pRRF5, contains a 3 kb EcoRI insert which includes the mouse Mu1 (Hox-2.1) homeo box and was obtained from Dr. A. Joyner (1).

POLYMORPHISM:

Constant TaqI bands were found at 2.8 kb, 3.9 and 4.6 kb bands in allele a and b. A variant band was found in allele b at 0.7 kb. In addition, intensity differences were observed between allele a and b with respect to the 3.9 and 4.6 kb bands (Fig. 1).

FREQUENCY:

Among inbred Mus musculus, allele a is found in strains: 129/J, A/J, ABP/Le, AKR/A, BALB/cAnPt, BALB/cHeA, BALB/cJ, BALB/cAn-nu, C57BL/6N, C57BL/10N, C57L/J, C58/J, CBA/J, CE/J, DBA/1J, DBA/2J, DBA/2N, MA/MyJ, MRL/MpJ-lpr, NZB/B1NJ, NZW/N, 020/A, P/J, ROP/Le, SEA/GnJ, SJL/JLwPt, and SM/J. Allele b is found in strains RIIS/J, STS/A, SWR/J and YBR/Ei.

NOT POLYMORPHIC FOR:

1) AccI, Aval, BglII, HaeIII, PvuII, RsaI, ScaI, XbaI (BALB/cHeA and STS/A); 2) EcoRI, HindIII, KpnI, MspI, PstI, StuI, XbaI (SWR/J and C57BL/10); 3) AccI, BamHI, EcoRI, KpnI, PstI, PvuII, StuI, XbaI (BALB/cAnPt and C57BL/6N); 4) BamHI, EcoRI, HindIII, PstI (ROP/Le and BALB/cAnPt).

CHROMOSOMAL LOCALISATION:

Reported as the distal region C to E of mouse chromosome 11 (2-4), and homologous with homeo box sequences on human chromosome 17 (2,3).

MENDELIAN INHERITANCE:

Segregation of the 0.7 kb restriction fragment was followed among the CXS recombinant inbred strains and progeny of a SWR/J x C57BL/10ScSn backcross. Thirty-one progeny resulting from the cross SWR/J x (SWR/J x C57BL/10ScSn)F1 were typed for cosegregation of Hox-2 alleles with those for IL-3 (5) (32% recombination) and for SPARC (6) (17% recombination).

PROBE AVAILABILITY:

Contact Drs. A. Joyner, C. Hauser or G. Martin.

REFERENCE:

1. Hauser et al. Cell (1985), 43:19-28. 2. Joyner et al. Nature (1985), 314:173-175. 3. Rabin et al. Nature (1985), 314:175-178. 4. Munke et al. Cytogenet. Cell. Genet. (1986), 42:236-240. 5. Yokota et al. Proc. Natl. Acad. Sci. USA (1984), 81:1070-1074. 6. Mason et al. The EMBO J. (1986), 5:1831-1837. 7. Hilgers, J. et al. Mouse News Lett. (1986), 76:14-26.

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Figure 1. Autoradiogram of a Southern blot probed with the 3 kb EcoRI insert of pRRF5. TaqI restricted DNAs from 1) a STS/A mouse and 2) a BALB/cHeA mouse. The strain distribution pattern for the Hox-2 locus (CCSSSSSCSSSSCS) among the 14 CXS recombinant inbred strains is 100% concordant with the D1b-1 locus and 93% concordant with the U1a locus both of which are within a 3 cM region of chromosome 11 (7).