Isolation and mapping of a polymorphic DNA sequence, DXS312, to Xq27-Xq28

L.Mulligan¹, R.Sood¹, A.M.V.Duncan¹, R.Poon¹, B.N.White¹ and J.J.A.Holden^{1,2,3}

¹Department of Biology, ²Department of Psychiatry, Queen's University, Kingston K7L 3N6 and ³Cytogenetics and DNA Research Laboratory, Ongwanada Hospital, Kingston K7L 1J9, Canada

SOURCE/DESCRIPTION: The parental phage clone was isolated from a human X-chromosome-hamster library constructed in λ Charon 4 (1). Two unique fragments (a HindIII 1.6 kb fragment and a HindIII/EcoRI 1.1 kb fragment) were subcloned into pUC8 and termed pX135f and pX135g, respectively.

POLYMORPHISM: The probe pX135f detects an AvaII RFLP with A1 = 4.0 kb and A2 = 6.6 kb. The probe pX135g detects a different AvaII RFLP with B1 = 5.8 kb and B2 = 3.4 kb.

FREQUENCY: Results from 100 unrelated chromosomes:

A1 - 4.0 kb allele 0.76

Results from 111 unrelated chromosomes:

B1 - 5.8 kb allele 0.70

The two RFLPs are in linkage disequilibrium with haplotype frequencies:

A1 B1 - 0.70

A1 B2 - 0.06

A2 B1 - 0.00

A2 B2 - 0.24

NOT POLYMORPHIC FOR: BamHI, BglII, BstEII, CfoI, EcoRI, HaeIII, HincII, HindIII, HinfI, KpnI, MspI, NciI, PstI, PvuII, SstI, TaqI, XbaI and XmnI.

CHROMOSOMAL LOCALIZATION: The probes were localized to Xq26-Xqter using a panel of somatic cell hybrids deleted for various parts of the X-chromosome. The probe pX135f was localized to Xq27-Xq28 by *in situ* hybridization. Multipoint linkage analysis in 15 fragile-X families placed the probe locus 13 cM proximal to the fragile-X locus (2).

MENDELIAN INHERITANCE: X-linked codominant segregation pattern observed in 15 families with the fragile-X syndrome.

PROBE AVAILABILITY: Available to collaborators.

REFERENCES:

1. Riddell DC, Wang H-S, Beckett J, Chan A, Holden JJA, Mulligan IM, Phillips MA, Simpson NE, Wrogemann K, Hamerton JL and White BN (1986). Regional localization of 18 human X-linked DNA sequences. Cytogenet Cell Genet 42: 123-128.
2. Sood R, Mulligan IM, Poon R, White BN, and Holden JJA. Genetic Mapping of two new DNA markers in Xq26-Xq28 relative to the fragile-X syndrome locus (in preparation).

ACKNOWLEDGEMENTS: We thank the MRC, the Ontario Mental Health Foundation and The Ministry of Community and Social Service Lottery Research Grants Program for generous support.