Assignment¹ of the DMRT1 gene to tammar wallaby chromosome 3p by fluorescence in situ hybridization

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Manuscript received 24 June 2004; accepted in original form for publication by H.P. Klinger 16 July 2004.

¹ To our knowledge this is the first time this gene has been mapped in tammar wallaby.

Rationale and significance

DMRT1 (*doublesex* and *mab3* related transcript 1) is the most conserved gene in the vertebrate sex determination (SD) pathway so far identified, and is a member of a family of transcription factors (DM domain genes) important for SD and differentiation of male from female gonads (Raymond et al., 1999). DMRT1 maps to HSA9p24.3, a region implicated in XY sex reversal (Raymond et al., 1999). Its expression is limited to the gonads of many species including humans, mice, birds, fish, alligators and turtles (Pask et al., 2003 and references therein). Expression of DMRT1 in the tammar wallaby has been studied in detail by Pask et al. (2003). Here we have cloned the tammar genomic homologue of DMRT1. This is the first gene to be mapped to the tammar 3p, and may represent a region of homology with HSA9.

Materials and methods

A tammar wallaby BAC genomic DNA library was screened with labeled PCR products of three conserved intronic regions for DMRT1 (Brunner et al., 2001) amplified and sequence-verified from tammar genomic DNA. Four candidate-positive clones were isolated and subsequent PCR and

Fig. 1. FISH mapping of MeDM1B3, the tammar wallaby DMRT1 homologue. Hybridization signals were observed on the short arm of chromosome 3. Chromosome 3 can be distinguished from chromosome 4, of similar size and morphology, by its pale centromeric region when viewed as an inverted DAPI image.

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sequencing revealed that one, MeDM1B3, contained the wallaby DMRT1 gene. This clone was biotin-14-dCTP labeled by nick translation and hybridized to tammar wallaby metaphase chromosomes. Hybridization signals were detected with avidin conjugated to FITC, and the chromosomes were counterstained with DAPI.

Probe name(s): MeDM1B3

Probe type: Genomic DNA

Insert size: approximately 90–110 kb

Vector: pRazorBAC

Proof of authenticity: PCR and sequencing

Results

Mapping data:

Most precise location: 3p

No. of cells examined: 20

Number of cells with specific signal: 1 (0), 2 (4), 3 (4), 4 (12)
chromatids per cell

References

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