**Assignment**¹ of the bovine attractin (ATRN) gene to chromosome 13q21→q22 by in situ hybridization

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¹ This is a more precise localization of a gene previously genetically mapped to bovine chromosome 13 by Edeal et al., (2000).

**Rationale and significance**

Attractin (ATRN, mahogany) is a gene involved in the regulation of pigmentation, body weight regulation and formation of the central nervous system in mammals (Gunn et al., 2001; He et al., 2001). Moreover, a soluble form of attractin found in humans is implicated in monocyte spreading and T-cell clustering (Duke-Cohan et al., 1998). In mice Atrn was mapped to MMU2, 73.9 cM (www.informatics.jax.org). By EST database searching Tang et al., (2000) mapped ATRN to human chromosome 20p13. Bovine ATRN was mapped to chromosome 13 by linkage analysis (Edeal et al., 2000). Here we report the physical mapping of bovine ATRN to BTA 13q21→22 by FISH.

**Materials and methods**

The coding sequence of bovine ATRN was amplified using cross-species primers and sequenced. A bovine BAC library was screened by PCR using bovine specific primers. BAC DNA was isolated using a Qiagen Plasmid Maxi Kit. BAC DNA was digested with restriction enzyme Sau3AI and labeled with biotin-16-dUTP (Boehringer Mannheim, GmbH) using a Prime-it Fluor® Fluorescence Labelling Kit (Stratagene). Chromosomal localization of the BAC clone was assigned by fluorescence in situ hybridization (FISH) on GTG and RBA banded bovine metaphases as described elsewhere (Solinas-Toldo et al., 1995; Graphodatsky et al., 2002).

- **Probe name:** Mgex3
- **Probe type:** bovine genomic BAC clone
- **Insert size:** appr. 115–120 kb
- **Vector:** pBeloBAC11
- **Proof of authenticity:** sequencing
- **Gene reference:** AF531101

**Results**

**Mapping data**

| Most precise location: 13q21→q22 |
| Number of cells examined: 17 |
| Number of cells with specific signal: 0 (3), 1 (0), 2 (5), 3 (2), 4 (7) chromatids per cell |
| Location of background signals (sites with >2 signals): none observed |

**Mapping by FL**

| Number of chromosomes examined: 34 |
| Mean location: 0.731 Bands encompassed: 13q21→q22 |
| Range: 33% on 13q21 and 67% on 13q22 |
| Standard deviation: ± 0.06 |

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Fig. 1. Assignment of ATRN to BTA13 by FISH. (left) GTG banded chromosomes before FISH; (right) the same chromosomes after FISH with bovine BAC clone containing ATRN. Location of ATRN on BTA 13q21→q22 is in agreement with ZOO-FISH data, as human chromosome 20 paints to 13q17→qter (Solinas-Toldo et al., 1995). Four genes were mapped closely to ATRN in cattle: PRNP (13q17), AVP (13q21→22), SOD1L1 (13q21→q22), and TOP1 (13q22→q23)(http://focus.jouy.inra.fr); two of these genes, PRNP and AVP, are known to be located closely to ATRN in human and mouse (www.informatics.jax.org).

References


