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Abstract

Source and Description of Probe. PGM-9B is a 1,500-bp pig cDNA clone (Turner et al., 1995) that encodes a tandem repeat region of pig gastric mucin and has recently been shown to overlap clones that exhibit considerable (>60 to 80%) homology with the MUC5AC gene in the non-repeat regions (Turner et al., 1996).

Keywords

Porcine, Mucin, Gene Mapping

Disciplines

Agriculture | Animal Sciences | Genetics and Genomics

Comments

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Rapid Communication: *Bam*HI Restriction Fragment Length Polymorphism Detected with a Pig Gastric Mucin (MUC5AC) Probe^{1,2}

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Source and Description of Probe. PGM-9B is a 1,500-bp pig cDNA clone (Turner et al., 1995) that encodes a tandem repeat region of pig gastric mucin and has recently been shown to overlap clones that exhibit considerable (>60 to 80%) homology with the MUC5AC gene in the non-repeat regions (Turner et al., 1996).

Method of Detection. DNA was digested with the restriction enzyme *Bam*HI. Fragments were separated by agarose gel electrophoresis and alkaline vacuum-transferred to charged nylon membranes. Hybridizations were at 65°C for 16 to 18 h (10% dextran sulfate, .5 M NaCl, .05 M sodium phosphate, pH 6.5, 5× Denhardt's, .5% SDS, 50 µg/mL sonicated denatured salmon sperm DNA). Final washes were at 65°C in .7× SSC, .5% SDS for 20 min.

Description of Polymorphism. Hybridization of the *Bam*HI-digested pig DNA with the labeled pig PGM-9B probe revealed six polymorphic fragments with estimated sizes of 8.9, 8.7, 8.1, 7.8, 7.1, and 6.5 kb. Polymorphisms were found with *Taq*I, *Pst*I and *Msp*I.

Inheritance Pattern. Autosomal Mendelian inheritance was demonstrated in five three-generation families. Segregation of the alleles of one family is shown (Figure 1).

Chromosomal Location. The MUC5AC homolog, detected by PGM-9B, mapped to pig chromosome 2 (SSC2) using linkage mapping and the PiGMaP reference families.

Frequency. Analysis of 39 unrelated animals from seven breeds gave allelic frequencies of .27 for the 8.9-kb fragment, .19 for the 8.7-kb fragment, .27 for the 8.1-kb fragment, .22 for the 7.8-kb fragment, .04 for the 7.1-kb fragment, and .01 for the 6.5-kb fragment. The Chinese breeds Meishan and Minzhu predominantly had the 8.9-kb and 8.1-kb alleles, and the Duroc, Hampshire, and Landrace mostly had the 8.7-kb and 7.8-kb alleles. The Large White primarily had the 8.7-, 8.1-, and 7.8-kb alleles as well as the only occurrence of the 6.5-kb allele.

Comments. Mucins, epithelial glycoproteins, are the major secretory proteins of mucus. In the pig stomach the mucin gel is a protective barrier against luminal HCl and pathogenic microorganisms. Pigny et al. (1995) demonstrated that the MUC5AC maps to chromosome 11p15 in the human.

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Key Words: Porcine, Mucin, Gene Mapping

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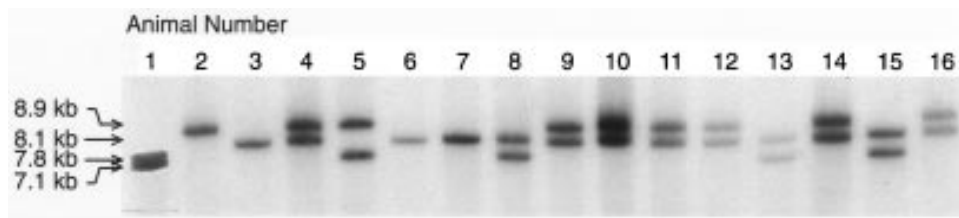


Figure 1. Inheritance pattern observed in one family. Animals 1 and 2 are parents of animal 5, and animals 3 and 4 are parents of animals 6 and 7. Animals 5 and 6 are parents of 8-16.