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E. A. Mendez
Iowa State University

Catherine W. Ernst
Iowa State University

Max F. Rothschild
Iowa State University, mfrothsc@iastate.edu

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Abstract

Source and Description of Primers. Primers were designed from published porcine myogenin (MYOG) sequence (GenBank accession number U14331) and were used to amplify a 1,644-bp fragment of the MYOG gene from porcine genomic DNA.

Keywords

Pigs, Muscles, Myogenin Gene

Disciplines

Agriculture | Animal Sciences | Genetics and Genomics

Comments

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Rapid Communication: A Novel DNA Polymorphism of the Porcine Myogenin (MYOG) Gene¹

E. A. Mendez, C. W. Ernst², and M. F. Rothschild³

Department of Animal Science, Iowa State University, Ames 50011

Source and Description of Primers. Primers were designed from published porcine myogenin (MYOG) sequence (GenBank accession number U14331) and were used to amplify a 1,644-bp fragment of the MYOG gene from porcine genomic DNA.

Primer Sequences. Forward primer: 5'-TCTAT-GACGGGGAAAACACTAC-3'; and reverse primer: 5'-TGGAGCCAGAGTGGTGTATC-3'.

Method of Detection. The PCR amplification was performed using 50 ng of genomic DNA, 1× PCR buffer (Promega), 1.5 mM MgCl₂, 200 μM each dNTP, 1 unit *Taq* polymerase (Promega), and .3 μM each primer in a 30-μL reaction volume. The PCR cycling conditions included an initial denaturation of 3 min at 94°C followed by 35 cycles of 1 min at 94°C, 1 min at 54°C, and 2 min at 72°C, with a final 10-min extension at 72°C. The PCR products were digested with *Nla*IV, and fragments were separated by electrophoresis on 3% agarose gels.

Description of Polymorphism. The PCR product digestion with *Nla*IV produced three large bands (520, 480, and 360 bp) and at least five additional smaller bands, the largest being approximately 170 bp. The 520- and 480-bp fragments were polymorphic, and the 360-bp fragment was monomorphic.

Inheritance Pattern. Autosomal Mendelian segregation of the polymorphic fragments (520 and 480 bp) was observed in one three-generation and two two-generation families.

Frequency. Analysis of 77 unrelated pigs from 10 breeds indicated allelic frequencies of .11 for the 520-bp fragment and .89 for the 480-bp fragment (Table 1).

Chromosomal Location. The porcine MYOG gene has been previously assigned by linkage analysis to porcine chromosome 9 (Ernst et al., 1993; Archibald et al., 1995).

Comments. Myogenin is a member of the MyoD family of skeletal muscle transcription factors (Wright et al., 1989). It is responsible for converting mesodermal cells to myoblasts and controls the fusion of myoblasts into myofibers.

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Table 1. Frequency of Myogenin genotypes in several breeds

Breed	n	Frequency of pigs with indicated genotype ^a		
		AA	AB	BB
Yorkshire	11	0	0	100
Chester White	10	10	0	90
Duroc	11	0	0	100
Hampshire	11	0	0	100
Landrace	8	0	0	100
Minzhu	4	0	50	50
Meishan	10	50	20	30
Large White	5	0	20	80
Pietrain	3	0	0	100
Berkshire	4	0	0	100
Total	77			

^aA = 520-bp *Nla*IV fragment; B = 480-bp *Nla*IV fragment.

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²Present address: Dept. of Anim. Sci., Michigan State Univ., East Lansing 48824.

³To whom correspondence should be addressed.

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