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# Rapid communication: BslI polymorphism at the swine alpha-actinin2 locus

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**Abstract**
Source and Description of Clone. A 1.9-kb partial cDNA insert of porcine a-actinin2 in a pBluescript SKphagemid vector was isolated from a swine adult skeletal muscle cDNA lambda ZAP11 library (kindly provided by Charles Louis, University of Minnesota).

**Keywords**
Porcine, Muscle, Binding Proteins, PCR, RFLP

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# Rapid Communication: *BslI* Polymorphism at the Swine α-*Actinin2* Locus[1]

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*Source and Description of Clone.* A 1.9-kb partial cDNA insert of porcine α-*actinin2* in a pBluescript SK- phagemid vector was isolated from a swine adult skeletal muscle cDNA lambda ZAPII library (kindly provided by Charles Louis, University of Minnesota).

*Method of Detection.* Polymerase chain reaction primers designed from the 3′ untranslated region of α-actinin2 were used to amplify a 220-bp fragment from 250 ng of swine genomic DNA. The two primers used were 5′-AACAGAGAGGGGAGGTACAGCATTT-3′ and 5′-AATTCATTCCGTGCGGTAGGAGTTC-3′. PCR conditions began with a 90-s denaturation step at 95°C, followed by five cycles of 95°C for 1 min, 58°C for 1 min, and 72°C for 1 min. An additional 25 cycles were performed with denaturation at 90°C for 1 min and annealing and extension as before. A final incubation was performed at 72°C for 5 min.

Polymerase chain reaction products were digested with *BslI* and electrophoresed on nondenaturing polyacrylamide gels (15% acrylamide, 29:1 acrylamide:bisacrylamide) followed by ethidium bromide staining and exposure to UV light.

*Description of Polymorphism. BslI* digestion of the 220-bp amplified product yielded up to six fragments. The 50-bp, 31-bp, and 19-bp fragments were polymorphic. Homozygous animals have either the 50-bp fragment (designated the B allele) or the 31-bp and 19-bp fragments (designated the A allele) (Figure 1). Monomorphic bands of 95, 46, and 29 bp were also observed.

*Inheritance Pattern.* Autosomal Mendelian segregation of the polymorphic fragments was observed in 167 pigs in eight families.

*Frequency.* The frequency of the alleles in 69 unrelated pigs from eight breeds was .20 for the B allele and .80 for the A allele (Table 1).

*Chromosomal Location.* Unknown.

*Comments.* The α-*actinin2* gene is involved in anchoring of the myofibrillar actin filaments (Beggs et al., 1992). Mutants in α-*actinin* that cause paralysis, weakness, and atrophy in muscle have been identified in *Drosophila* (Roulier et al., 1992).

*Literature Cited*

Beggs, A. H., T. J. Byers, J.H.M. Knoll, F. M. Boyce, G.A.P. Bruns, and L. M. Kunkel. 1992. Cloning and characterization of two human skeletal muscle α-actinin genes located on chromosomes 1 and 11. J. Biol. Chem. 267:9281.

Roulier, E. M., C. Fyrberg, and E. Fyrberg. 1992. Perturbations of *Drosophila* α-actinin cause muscle paralysis, weakness, and atrophy but do not confer obvious nonmuscle phenotypes. J. Cell Biol. 116:911.

Key Words: Porcine, Muscle, Binding Proteins, PCR, RFLP

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Table 1. Frequency of alleles

| Breed (no.) | Percentage of pigs with indicated genotype | | |
|---|---|---|---|
| | A/A | A/B | B/B |
| Fengjing (6) | 67 | 33 | 0 |
| Meishan (9) | 89 | 11 | 0 |
| Minzhu (8) | 37.5 | 62.5 | 0 |
| Chester White (8) | 37.5 | 25 | 37.5 |
| Duroc (9) | 89 | 11 | 0 |
| Hampshire (12) | 83 | 17 | 0 |
| Landrace (8) | 37.5 | 37.5 | 25 |
| Yorkshire (9) | 78 | 22 | 0 |

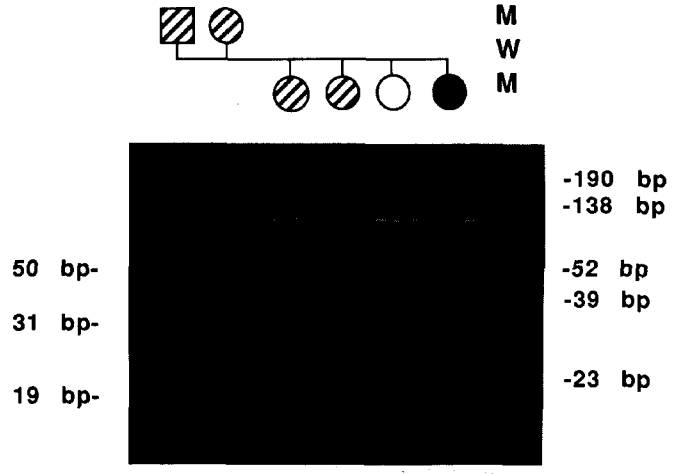


Figure 1. Mendelian segregation of a *BslI* polymorphism at the porcine α-*actinin2* locus. Shaded symbols indicate heterozygous pigs; open (BB) and solid (AA) symbols indicate homozygous pigs. Lane 7 molecular weight marker is pGEM2 digested with *MseI*.

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