

***SREBF1* expression and genetic polymorphism significantly affect intramuscular fat deposition in the longissimus muscle of Erhualian and Sutai pigs¹**

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ABSTRACT: Two experiments were performed to elucidate the role of sterol regulatory element binding transcription factor 1 (*SREBF1*) in intramuscular fat (IMF) deposition in pigs. In Exp. 1, LM samples were removed from 4 male and 4 female Erhualian (EHL) piglets at 3, 20 and 45 d of age and *SREBF1* mRNA expression level and IMF content were measured. Intramuscular fat content and expression of *SREBF1* mRNA was greater ($P < 0.05$) in females than males at all three stages of age, providing initial evidence that the level of *SREBF1* mRNA expression is related to IMF deposition in muscle of suckling pigs. Additionally, in Exp. 2 there was a significantly positive correlation between the *SREBF1* mRNA level and IMF content ($r = 0.67$, $P < 0.01$) in 100 Sutai finishing pigs, a synthetic line produced by crossing EHL and Duroc pigs. Single strand conformation polymorphism (SSCP) analysis of the reverse transcription PCR (RT-PCR) products of *SREBF1* gene revealed 3 genotypes in Sutai pigs with frequencies of 50% for AA, 36% for AB and 14% for BB, respectively. Both *SREBF1* mRNA level and IMF content in muscle were greater ($P < 0.05$) in AB and BB animals than in AA animals, while no difference in backfat thickness was observed among the 3 genotypes. Sequencing analysis identified two single nucleotide polymorphisms (SNP) at T1006C and C1033T within the open reading frame of *SREBF1* gene (NM_214157). Although both are silent mutations, they affected the secondary structure of *SREBF1* mRNA. These results suggest that *SREBF1* might play an important role in regulation of muscle fat deposition during postnatal growth of pigs. The SNP identified in the *SREBF1* gene suggest that it could be used as a genetic marker to improve IMF content in pigs.

Key words: association, intramuscular fat content, mutations, mRNA expression, pig, sterol regulatory element binding transcription factor 1

¹We thank Jennifer Michal, Department of Animal Sciences, Washington State University for editing the manuscript. This work was supported by National Basic Research Program of China (2004CB117505), Jiangsu Natural Science Foundation (BK2002204) and the Sino-German Cooperation in Agriculture (grant no. 26/2005–2006 “Adipogenesis”).

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