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Molecular Characterisation and Chromosomal Assignment of Porcine Bax and Tac1

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Abstract

The BCL^{-2} associated X protein (BAX) is a member of the Bcl^{-2} protein family and functions as a repressor of programmed cell death (apoptosis). The preprotachykinin A gene (TAC1) encodes two tachykinin peptides (substance P and neurokinin A) that act as neurotransmitters in the central and peripheral nervous systems. To isolate the genes from the porcine genomic PAC library TAIGP714 probes were generated with primers derived from exons of the human orthologs. For Bax, a 501-bp long fragment (spanning exons 3 to 4) was amplified on porcine genomic DNA (GenBank Accession no: AM233489). The TAC1-specific primers formed a 415-bp long amplicon (spanning exon 7) in pigs (GenBank Accession no: AM233488). Probe sequencing and comparison with the human genes verified sequence identity (BAX 94 % and TAC1 84 %). The gene-containing PAC clones were further isolated and sequenced. The chromosomal assignment of the genes was done by analyses of porcine hybrid panels (somatic cell and radiation hybrid panel) and by fluorescent *in situ* hybridisation. BAX was assigned to SSC6q21 and TAC1 to SSC9q12-q14. So far, comparative exon sequencing using a panel of 138 animals (Angeln Saddleback, Pietrain, German Landrace, German Edelschwein, Swabian-Haellian swine, Buntes Bentheimer, Thai native pigs, Thai wild pig, Chinese Luchuan, Chinese Rongchang, Chinese Yushanei as well as German and Thai herniated crossbred piglets) identified two SNPs in BAX (SNPintron1: C→T, p(C)=0.804 and q(T)=0.196; SNPintron3: T→A, p(T)=0.975 and q(A)=0.025). Up to now, no SNPs have been found in TAC1. The chromosomal localisation of BAX in combination with its known physiology proposes a possible contribution of the gene to the phenotype hernia, but this hypothesis has to be further elucidated.

Keywords: BAX, pig, SSC6q21, SSC9q12–14, TAC1

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