ISOLATION AND CHARACTERIZATION OF PORCINE FBXO7

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Introduction: Parkinsonian pyramidal syndrome, also named pallido-pyramidal syndrome, (PKPS) is the combination of early-onset progressive Parkinsonism with pyramidal tract signs. PKPS is a hypokinetic disorder often with vague clinical symptoms at the debut in early adulthood. FBXO7, a F-box protein, is a component of modular E3 ubiquitin protein ligases called SCFs (SKP1, cullin, F-box proteins), which function in phosphorylation-dependent ubiquitination. FBXO7 mutations cause autosomal recessive early-onset PKPS.

Aims: The aim of this study was to identify mutations associated with PKPS in the porcine FBXO7 gene.

Results: We here report the molecular cloning and characterization of two isoforms of FBXO7 cDNA from pigs. The encoded FBXO7 protein displays a very high homology to human FBXO7 (90 % identity). Furthermore, the genomic structure of the porcine FBXO7 gene was determined from the most recent sequence data published. The intron-exon structure is very similar to that of the human FBXO7 gene. The promoter sequence for the porcine FBXO7 gene was also identified. A recognition site for miR-301a was found in the 3'UTR of porcine FBXO7. To investigate the genetic variation in the porcine FBXO7 gene we have performed SNP analysis of exons 1, 3, 5, 7 and 8 in a boar panel. A missense A/G SNP (N269S) was found in exon 5. Two silent mutations were found in exon 3 and exon 9. Using a radiation hybrid panel the FBXO7 gene was mapped to pig chromosome 5. Real-time quantitative RT-PCR analysis revealed that FBXO7 mRNA is differentially expressed in many tissues and organs.