



cDNA, genomic sequence cloning and overexpression of giant panda (*Ailuropoda melanoleuca*) mitochondrial ATP synthase *ATP5G1*

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ABSTRACT. The *ATP5G1* gene is one of the three genes that encode mitochondrial ATP synthase subunit c of the proton channel. We cloned the cDNA and determined the genomic sequence of the *ATP5G1* gene from the giant panda (*Ailuropoda melanoleuca*) using RT-PCR technology and touchdown-PCR, respectively. The cloned cDNA fragment contains an open reading frame of 411 bp encoding 136 amino acids; the length of the genomic sequence is of 1838 bp, containing three exons and two introns. Alignment analysis revealed that the nucleotide sequence and the deduced protein sequence are highly conserved compared to *Homo sapiens*, *Mus musculus*, *Rattus norvegicus*, *Bos taurus*, and *Sus scrofa*. The homologies for nucleotide sequences of the giant panda ATP5G1 to those of these species are 93.92, 92.21, 92.46, 93.67, and 92.46%, respectively, and the homologies for amino acid sequences are 90.44, 95.59, 93.38, 94.12, and 91.91%, respectively. Topology prediction showed that there is one protein kinase C phosphorylation site, one

casein kinase II phosphorylation site, five N-myristoylation sites, and one ATP synthase c subunit signature in the ATP5G1 protein of the giant panda. The cDNA of *ATP5G1* was transfected into *Escherichia coli*, and the ATP5G1 fused with the N-terminally GST-tagged protein gave rise to accumulation of an expected 40-kDa polypeptide, which had the characteristics of the predicted protein.

Key words: Giant panda; *Ailuropoda melanoleuca*; *ATP5G1*; cDNA cloning; Overexpression