

畜牧—研究报告

羊驼垂体催乳素 (PRL) 基因全长cDNA的克隆及序列分析

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摘要:

[目的]获得并分析羊驼PRL基因cDNA全序列结构,为研究羊驼催乳素(PRL)的各种生物学作用和生产应用提供理论依据。[方法]根据已知的不同哺乳动物的PRL基因cDNA序列,设计羊驼PRL引物,运用RT-PCR方法和cDNA末端快速扩增(RACE)技术获得羊驼PRL基因cDNA全序列。[结果与结论]羊驼PRL基因cDNA序列全长959bp,编码区为687bp,编码229个氨基酸的PRL前体蛋白。预测羊驼PRL蛋白质的空间结构类似人生长激素(GH),但在81位(成熟肽为51位)为蛋氨酸可能导致蛋白空间结构的不同而影响羊驼PRL的功能;序列比对结果表明,羊驼PRL的cDNA序列与大多数哺乳动物相似。构建的基因进化树分析结果显示,羊驼PRL与骆驼的亲缘关系最近;同多数哺乳动物一样,羊驼PRL进化速度极缓慢,没有发生人、灵长类、啮齿类、反刍动物的“episodic”式进化。

关键词: 羊驼; 催乳素基因; 全长cDNA; 序列分析

Cloning and Sequence Analysis of the Full-length cDNA of PRL Gene from Alpaca Pituitary

Abstract:

[Objective]In order to provide theoretical basis for studying biological function and application of alpaca prolactin (PRL), the alpaca PRL cDNA sequence were cloned and analyzed. [Method] According to the known cDNA sequences from mammals, alpaca PRL primers was designed and the full-length cDNA of PRL from alpaca pituitary was cloned by RT-PCR and RACE techniques. [Results and Conclusions] The size of full-length cDNA of PRL from alpaca pituitary was 959 bp and it contained an open reading frame (ORF) of 687 bp which encoded PRL precursor protein with 229AA. PRL precursor protein was a single-chain polypeptide composed of 30-AA signal peptide and 199-AA mature peptide. The spatial structure of alpaca PRL protein was similar to human GH. The result of the sequence alignment showed that the amino acids composition of alpaca PRL was similar to most mammals, but the methionine at 81-AA (51-AA for mature peptide) may lead to different spatial structure which may impact functions of alpaca PRL. A phylogenetic tree constructed basing on the amino acid sequences of alpaca PRL and other organisms showed that the relationships between alpaca PRL and camel PRL were closest and that the evolution speed of alpaca was very slow with no "episodic" evolution pattern as most mammals such as primates, rodents and ruminant.

Keywords: alpaca prolactin(PRL) gene cDNA sequence sequence analysis

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