

ROLES OF FIBROBLAST GROWTH FACTOR 9 AND LOC105611671 IN HU SHEEP TESTOSTERONE BIOSYNTHESIS

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Introduction

Fibroblast growth factor 9 (FGF9) is a member of the FGF family. In mice and human embryos, FGF9 has a crucial role in early gonadal development and germ cell maturation. Previous reports have focused mainly on the roles of FGF9 in males and females of humans and rodents, and there is less information about FGF9 and its upstream lncRNA *Loc105611671* in sheep. Therefore, we explored the roles of FGF9 and *Loc105611671* in ovine testis development and steroidogenesis.

Materials and Methods

Fifteen healthy Hu male sheep in various developmental stages, including 3 M (months; n=5), 9 M (n=5), and 24 M (n=5) were used in research. Serum FGF9 and testosterone concentrations were detected by ELISA; qRT-PCR and Western blot analysis were performed to measure expressions of genes and proteins in testis. siRNA transfection was performed in Leydig cells.

Results and Discussion

In this study, we discovered the level of serum FGF9 had a significant increase ($P < 0.05$) in 9 M compared to 3M of male sheep, as well as the level of *FGF9* mRNA in ovine testis. Furthermore, the levels of the *Loc105611671* mRNA and FGF9 protein increased in ovine testis from 3 M to 24 M. This suggested that FGF9 and *Loc105611671* may be associated with ovine testis development and steroidogenesis. To investigate the role of *Loc105611671* and FGF9 in testosterone biosynthesis, the levels of testosterone and testosterone synthesis-related enzymes were measured. We observed significant decreases in secreting testosterone levels and the levels of testosterone synthesis-related enzymes in Leydig cells after downregulating *Loc105611671* or *FGF9* expression using siRNA ($P < 0.05$). The results indicated *Loc105611671* act as a positive regulator of FGF9, which can regulate the secretion of testosterone.