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Alpaca fiber growth is mediated by microRNA let-7b via down-regulation of target gene FGF5

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ABSTRACT. MicroRNAs are very small endogenous RNA molecules that play a crucial role in an array of biological processes, including regulation of skin morphogenesis. The microRNA let-7b is thought to modulate animal hair growth, by binding target genes that encode growth factors. Fibroblast growth factor 5 (*FGF5*) has been previously reported to be involved in the initiation of the catagen phase of hair growth. In this study, we combined previous reports with bioinformatic analysis techniques to identify and validate *FGF5* and, using lucerifase assay, confirmed targeted binding of let-7b to *FGF5*. To investigate the interaction between let-7b and *FGF5*, alpaca skin fibroblasts were transfected with let-7b over-expression vectors, and then mRNA and protein expression levels of *FGF5* and the gene encoding its receptor, *FGFR1*, were evaluated. Levels of *FGF5* mRNA and protein were remarkably lower in transfected groups, as compared to controls. In summary, this study confirmed that let-7b acts as a regulator of skin morphogenesis, by directly targeting *FGF5* and down-regulating its

expression. It provides the evidence of hair growth regulated by miRNAs in animals and may have important applications in wool production.

Key words: Dual-luciferase reporter assay system; Alpaca fiber; Fibroblast growth factor 5; MicroRNA

