Correlation between sheep YAP1 temporal and spatial expression trends and MSTN and MyoG gene expression

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ABSTRACT. The aim of the current study was to investigate the effects of Yes-associated protein 1 (YAP1) gene expression after birth on the development of muscle and the relationship between YAP1 and myostatin (MSTN) and myogenin (MyoG). Reverse transcription polymerase chain reaction was used to analyze the trends in YAP1, MSTN, and MyoG temporal and spatial expression levels in various skeletal muscles (i.e., longissimus dorsi muscle, soleus muscle, gastrocnemius muscle, and extensor digitorum longus) and across 3 different growth stages (i.e., 2 days old, 2 and 6 months old) of Hu Sheep. The results showed that YAP1 expression was significantly different in the skeletal muscles of sheep; the expression level gradually increased with age; it was highly expressed in the gastrocnemius muscle and minimally expressed in the longissimus dorsi muscle. MSTN, a negative regulator
of skeletal muscle development, was minimally expressed in the soleus muscle and might be related to the enlargement of muscle fiber diameter. MyoG, an important factor in regulating skeletal muscle development, was minimally expressed in the longissimus dorsi muscle and extensor digitorum longus, and highly expressed in the gastrocnemius and soleus muscles; it might inhibit the enlargement of muscle fiber diameter after birth. YAP1 expression was significantly (P < 0.05) or extremely significantly (P < 0.01) and positively correlated with MSTN and MyoG at 2 days old, 2 and 6 months old. YAP1 expression was related to muscle fiber development after birth and might be a candidate gene for the regulation of muscle growth.

**Key words:** Hu-sheep; YAP1; MSTN; MyoG; Gene expression; Muscle fiber development