Effects of Living-High Training-Low on HIF-1α Transcriptional Regulatory Factors MAPKs mRNA in Gastrocnemius of Rats

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Objective To evaluate the effects of Living-High Training-Low on HIF-1α transcriptional regulatory factors MAPKs mRNA in gastrocnemius of Rats.

Methods After adaptive training, 40 8-weeks-old male SD rats were divided into living-low quiet control group (LC), living-low training-low group (LoLo), living-high quiet control group (HC), living-high training-low group (HiLo). All living-high groups stayed in the environment with 13.6% oxygen concentration, about altitude of 3500 m, for 12h/day. All training groups underwent treadmill training with 35m/min for 1 hour/day, 5days/week. 4 weeks later, the gastrocnemius was sampled 24 hours after the last training. The ERK, p38MAPK, JNK and HIF-1α mRNA genes expressions in gastrocnemius were measured by real-time quantitative PCR.

Results The gastrocnemius ERK mRNA of HiLo group was significantly higher than LC ($P<0.01$), LoLo and HC groups ($P<0.05$). The p38MAPK mRNA of HiLo group was significantly higher than LC and LoLo groups ($P<0.01$ and $P<0.05$), and there was no significant difference between HiLo and HC group ($P>0.05$). The JNK and HIF-1α mRNA of HiLo group were significantly higher than other groups ($P<0.01$).

Conclusions Living-High Training-Low significantly raise ERK, p38MAPK, JNK and HIF-1α gene expression in gastrocnemius of Rats. ERK, p38MAPK and JNK may be one of the transcription factors regulating HIF-1α mRNA expression in Living-High Training-Low in gastrocnemius of Rats.