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Long interspersed nucleotide acid element-1 ORF-1 protein promotes proliferation and invasion of human colorectal cancer LoVo cells through enhancing ETS-1 activity

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ABSTRACT. The human proto-oncogene long interspersed nucleotide acid element-1 (LINE-1) open reading frame-1 protein (ORF-1p) is involved in the progress of several cancers. The transcription factor ETS-1 can mediate the transcription of some downstream genes that play specific roles in the regulation of cancerous cell invasion and metastasis. In this study, the effects of LINE-1 ORF-1p on ETS-1 activity and on the proliferation and invasion of human colorectal cancer LoVo cells were investigated. Results showed that the overexpression of LINE-1 ORF-1p enhanced the transcription of ETS-1 downstream genes and increased their protein levels, and downregulation of the LINE-1 ORF-1p level by small interfering RNA (siRNA) reduced the transcriptional activation of ETS-1. In addition, overexpression of LINE-1 ORF-1p promoted LoVo

cell proliferation and anchor-independent growth, and a knockdown of the LINE-1 protein level by siRNA reduced the proliferation and anchor-independent growth ability of LoVo cells. *In vivo* data revealed that LINE-1 ORF-1p overexpression increased LoVo tumor growth in nude mice, whereas the siRNA knockdown of endogenous LINE-1 ORF-1p expression decreased LoVo cell growth in nude mice. Therefore, LINE-1 ORF-1p could promote LoVo cell proliferation and invasion both *in vitro* and *in vivo*, indicating that it might be a useful molecular target for the treatment of human colorectal cancer.

Key words: LINE-1 ORF-1p; ETS-1; Colorectal cancer LoVo cell; Transcriptional activation; Proliferation; Anchor-independent growth

