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Inhibition of Telomerase Activity by Cucurbitacin I in Colon Cancer Cell Line, LS174T †

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Abstract: Telomerase activity is dependent on the expression level of human telomerase reverse transcriptase (hTERT) in cancer cells. hTERT messenger ribonucleic acid (mRNA) is expressed in more than 85% of cancer cells, but not in normal human somatic cells. Therefore, the proliferation of human cancer cells can be arrested by telomerase inhibition. We aimed to investigate the effect of cucurbitacin I on the inhibition of hTERT mRNA expression in LS174T colorectal carcinoma cells. After treating the LS174T cells with various concentrations (2.5–125 ng/mL) of cucurbitacin I for 24 h, total RNA was extracted and cDNA was synthesized. Real-time PCR was used for quantitative assessment of hTERT mRNA gene expression versus control group. The level of hTERT mRNA was calculated via normalized to β-actin mRNA level which uniformly expressed housekeeping gene, within each sample. The results of our investigation suggested that cucurbitacin I significantly inhibited telomerase activity and showed a considerable decrease in mRNA expression of hTERT in the treated cells in comparison with the control cells in a concentration-dependent manner. Preliminary study shows that cucurbitacin I is effective for the inhibition of telomerase activity in colorectal cancer.

Keywords: cucurbitacin I; telomerase activity; human telomerase reverse transcriptase messenger ribonucleic acid; LS174T cell line