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# Alteration of *p19* mRNA expression in esophageal cancer tissue from patients at high incidence area in northern China

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## Abstract

**AIM:** The INK4a tumor suppressor gene locus on human chromosome 9 *p21* encodes two unrelated proteins: *p16* INK4a, a specific inhibitor of the cyclin D-dependent kinases CDK4 and CDK6, and *p19*ARF, an alternative reading frame protein which can also induce cell cycle arrest in G1/S and G2/M transition. Inactivation of *p16*INK4 is a frequent event in various human tumors; mice lacking *p19*ARF develop tumors early in life. The specific aim for this study was to investigate the possible role of *p19*ARF and its relationship with other tumor suppressor gene *p53* and *p21* in esophageal carcinogenesis.

**METHODS:** RT-PCR was used to measure the expression of *p19*ARF, *p53* and *p21* in 19 pairs of frozen normal esophageal and tumor samples. The cycle number for each pair of primers was fine-tuned to limit the amplification to a linear range. PCR products were then resolved on 2% agrosegel. The density and area of each band was measured using image-pro-plus 1.3 software. The relative expression level of each gene in tumor and normal was calculated using the housekeeping gene GAPDH as an internal control.

**RESULTS:** In the total of 19 tumor samples, 8(42) had at least a 3-fold decrease in *p19*ARF but with no decrease in *p53* expression, 5(26%) had significantly decreased expression of *p53* but had normal expression of *p19*ARF, only two samples (11%) had decreased level in both *p19*ARF and *p53* expression. The results suggest a negative correlation between the alterations of these two genes in the esophageal tumor. The relative expression level of *p21* in *p19*ARF negative sample (0.78 ± 0.16) is about half of that in *p19*ARF positive samples (1.63 ± 0.22).

**CONCLUSION:** Our results support the hypothesis that *p19* inactivation contributes to esophageal tumor progression and follows the same pathway as *p53* and *p21*.

**Key words:** Esophageal neoplasms; Chromosome 9 *p19*; *p53* gene; *p21* gene; mRNA



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