

## Attenuated *Salmonella typhimurium* carrying TRAIL and VP3 genes inhibits the growth of gastric cancer cells *in vitro* and *in vivo*

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### ABSTRACT

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**Background.** Tumor Necrosis Factor-Related Apoptosis-Inducing Ligand (TRAIL) and apoptin (VP3) of chicken anemia virus can selectively induce apoptosis in human tumor cell lines by two different pathways. *Salmonella* not only delivers functional genes to mammalian cells but also possesses antitumor activity and therefore could be adopted as a novel vector for anticancer therapy.

**Materials and methods.** TRAIL and VP3 genes were cloned into a pBudCE4.1 vector and delivered by attenuated *Salmonella typhimurium* into gastric cancer cells, and their expression and antitumor effects in nude mice were monitored by Western blot, fluorescence microscopy, MTT assay, TUNEL staining, and immunohistochemistry.

**Results.** pBud-VP3 and pBud-TRAIL-VP3 plasmids were constructed to express TRAIL and apoptin in gastric cancer cells, leading to inhibition of cancer cell proliferation after 48 hours ( $P < 0.05$ ). TRAIL and VP3 genes in pBudCE4.1 vector were also successfully delivered by attenuated *S. typhimurium* into gastric cancer cells *in vivo*, in which both TRAIL and apoptin were expressed. *In vivo* data indicated that *S. typhimurium* carrying pBud-TRAIL-VP3 induced significant cell growth inhibition and tumor regression ( $P < 0.05$ ). Moreover, expression of TRAIL and apoptin increased the expression of caspase-3 and caspase-9, resulting in enhanced apoptosis.

**Conclusion.** Delivery of TRAIL and VP3 genes by attenuated *S. typhimurium* can significantly inhibit the growth of gastric cancer cells *in vitro* and *in vivo*. **Free full text available at [www.tumorionline.it](http://www.tumorionline.it)**

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**Key words:** gastric cancer, apoptosis, attenuated *Salmonella typhimurium*, TRAIL, VP3.

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