Propofol inhibits proliferation and accelerates apoptosis of human gastric cancer cells by regulation of microRNA-451 and MMP-2 expression

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Genet. Mol. Res. 15 (2): gmr.15027078
Received June 24, 2015
Accepted October 30, 2015
Published April 4, 2016
DOI http://dx.doi.org/10.4238/gmr.15027078

ABSTRACT. Propofol is an extensively used intravenous anesthetic agent. The aim of the present study was to evaluate the effects of propofol on the behavior of human gastric cancer cells and the molecular mechanisms associated with this activity. The effects of propofol on proliferation and apoptosis in the SGC-7901 gastric cancer cell line were detected by an MTT assay and measurement of caspase-3 activity. The protein expression levels of matrix metalloproteinase-2 (MMP-2) were detected by western blotting. Reverse transcription-quantitative polymerase chain reaction was conducted to evaluate the effect of propofol treatment on microRNA (miR)-451 expression levels and an miR-451 precursor was used to evaluate whether miR-451 overexpression affects MMP-2 expression levels. In addition, the effect of miR-451 on propofol-induced antitumor activity was evaluated using anti-miR-451. Propofol significantly elevated miR-451 expression levels, inhibited SGC-7901 cell proliferation, and promoted apoptosis. Propofol also efficiently reduced MMP-2 protein expression levels. Furthermore, miR-451 overexpression reduced MMP-2 protein...
expression levels. In addition, neutralization of miR-451 by anti-miR-451 antibody reversed the effect of propofol on cell proliferation and apoptosis and upregulated MMP-2 expression in the SGC-7901 cells. Propofol effectively inhibited proliferation and induced apoptosis in gastric cancer cells, which was partly owing to the downregulation of MMP-2 expression by miR-451.

**Key words:** Propofol; Gastric cancer; miR-451; MMP-2; Proliferation; Apoptosis