Title of the article: Antitumor activity of the antimicrobial peptide magainin II against bladder cancer cell lines.

Abstract:
OBJECTIVE: Magainin II belongs to a family of antimicrobial peptides and has been shown to exhibit antibiotic activity in a wide range of organisms. Recent studies have also reported a significant antitumor effect of magainin II against various cancer cell lines and tumor mice models. In this study, we evaluated the cytotoxic and antiproliferative potency of magainin II in bladder tumor cells and normal fibroblasts. METHODS: The antiproliferative and cytotoxic effect of magainin II was quantified by colorimetric WST-1-, bromodeoxyuridine (BrdU)-, and lactic dehydrogenase (LDH) assays in three bladder cancer cell lines (RT4, 647V, and 486P) and in the murine fibroblast cell line 3T3 as well as in a primary culture from human fibroblasts. The median inhibitory concentration (IC50) values were determined for each assay, representing the concentration at which cell viability was reduced by 50%. Scanning electron microscopy (SEM) was used to visualize the morphologic effects of magainin II on bladder tumor cells and fibroblasts. RESULTS: Magainin II inhibited cell proliferation of bladder cancer cells in a dose-dependent manner. The average IC50 of magainin II against all bladder cancer cell lines was 198.1 microM (range, 52.4-484.03 microM) for the WST-1 assay and 75.2 microM (range, 31.0-135.3 microM) for the BrdU assay. The normal murine and human fibroblast cell lines were not affected by magainin II and their IC50...
could not be determined at the concentrations of magainin II tested. LDH release was increased in all bladder tumor cell lines in the presence of magainin II, whereas normal fibroblasts showed no cell lysis. SEM demonstrated lethal membrane perforation by peptide pore formation in bladder cancer cells, but not in fibroblasts. CONCLUSION: Magainin II peptide exerts cytotoxic and antiproliferative efficacy by pore formation in bladder cancer cells but has no effect on normal murine or human fibroblasts. Magainin II may offer a novel therapeutic strategy in the treatment of bladder cancer with potentially low cytotoxic effects on normal cells.