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## Platinum-zoledronate complex blocks gastric cancer cell proliferation by inducing cell cycle arrest and apoptosis

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New platinum complexes with different carrier ligands are developing to overcome the intrinsic or acquired resistance of the tumors during the therapy. A series of novel dinuclear platinum complexes based on the bisphosphonate ligands have been synthesized and characterized. For the purpose of discovering the pharmacology and action mechanism of this kind of compounds, the most potent compound [Pt(en)ZL] was selected for systematic investigation of the underlying mechanisms accounting for their anticancer activity. In this study, the human gastric cancer cell lines SGC7901 were selected to investigate the anticancer effects of [Pt(en)ZL] on this type of cancer cells. The MTT assay and colony formation assay were used to test the effect of [Pt(en)ZL] on the cell viability and proliferation, respectively. The senescence-associated  $\beta$ -galactosidase staining and immunofluorescence staining were also performed to assess the cell senescence and microtubule polymerization. Fluorescence staining and flow cytometry (FCM) were used to monitor the cell cycle distribution and apoptosis, and the expressions of related proteins were further detected with Western blot. [Pt(en)ZL] exerted profound cytotoxic and antiproliferative effects on SGC7901 cells, and it also induced cell senescence and abnormal microtubule assembly, indicating the progress of mitotic catastrophe. Cell cycle arrest and apoptosis induced by [Pt(en)ZL] were observed with FCM and fluorescence staining. The expressions of cell cycle regulators (p53, p21, cyclin D1, cyclin E and CDK2) and apoptosis-related proteins (Bcl-2, Bax, caspase 3, PARP and survivin) were mediated by [Pt(en)ZL], resulting in the cell cycle arrest and apoptosis. Therefore, [Pt(en)ZL] exerted antitumor effect via the cell cycle arrest in the G1/S phase and the induction of apoptosis.

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The pharmaceutical care and 'extended' roles are still not practiced optimally by community pharmacists. Several studies have discussed the practice of community pharmacy in the UAE and have shown that most community pharmacists only counsel patients. However, UAE, have taken initiatives to allow and prepare community pharmacists to practice 'extended' roles. The aim was to review the current roles of community pharmacists in Abu Dhabi Emirate, United Arab Emirates (UAE). The objective was to encourage community pharmacists towards extending their practice roles. In 2010, Health Authority Abu Dhabi (HAAD) surveyed community pharmacists, using an online questionnaire, on their preferences towards extending their counseling roles and their opinion of the greatest challenge facing the extension of their counseling roles. Following this survey, several programs have been developed to prepare community pharmacists to undertake these extended counseling roles. In addition to that, HAAD redefined the scope of pharmacist roles to include some extended/enhanced roles. Abu Dhabi Health Services (SEHA) mission is to ensure reliable excellence in healthcare. It has put clear plans to achieve this, these include increasing focus on public health matters, developing and monitoring evidence-based clinical policies, training health professionals to comply with international standards to deliver world-class quality care, amongst others. Prior to making further plans to extend community pharmacists' roles, and to ensure the success of these plans, it is imperative to establish the views of community pharmacists in Abu Dhabi on practicing extended roles and to gain understanding and information on what pharmacists see as preferred change strategies or facilitators to change. In an attempt to adapt to the changes occurring and to the growing needs of patients and to maximize the utilization of community pharmacists' unique structured strategies are needed to be introduced to the community pharmacy profession.

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