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Anvirzel™ in combination with cisplatin in breast, colon, lung, prostate, melanoma and pancreatic cancer cell lines

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Abstract

Background: Platinum derivatives are used widely for the treatment of many cancers. However, the toxicity that is observed makes imperative the need for new drugs, or new combinations. Anvirzel™ is an extract which has been demonstrated with experimental data that displays anticancer activity. The aim of the present study is to determine whether the combination of Cisplatin and Anvirzel™ has a synergistic effect against different types of cancer.

Materials and methods: To measure the efficacy of treatment with Cisplatin and Anvirzel™, methyl-tetrazolium dye (MTT) chemosensitivity assays were used incorporating established human cancer cell lines. Measurements were performed in triplicates, three times, using different incubation times and different concentrations of the two formulations in combination or on their own. t-test was used for statistical analysis.

Results: In the majority of the cell lines tested, lower concentrations of Anvirzel™ induced a synergistic effect when combined with low concentrations of Cisplatin after an incubation period of 48 to 72 h. The combination of Anvirzel™/Cisplatin showed anti-proliferative effects against a wide range of tumours.

Conclusion: The results showed that the combination of Anvirzel™ and Cisplatin is more effective than monotherapy, even when administered at low concentrations; thus, undesirable toxic effects can be avoided.

Keywords: Anvirzel™, Cisplatin, Viability assays, Cancer cell lines, Methyl-tetrazolium dye

Background

Many studies demonstrate the anti-proliferative activity of Oleandrin. These properties make it attractive for use as a treatment for cancer [1-5]; however, a major problem is that Oleandrin is toxic to normal cells and tissues [6,7]. Anvirzel™ is an extract of *Nerium oleander* comprised primarily of Oleandrin and Oleandrigenin [8]. Recent studies demonstrate that Anvirzel™ decreases viability in prostate cancer cell lines as well as a wide range of other human cancer cell lines [9-12]. Cisplatin (CDDP) is a platinum-based chemotherapy drug used to treat various types of cancer [13,14]. Because it is highly toxic, and because of primary and secondary resistance of cancer cells to Cisplatin [15], it is commonly used in combination with other drugs [16,17]. A recent study reported that the combination of Anvirzel™, Carboplatin and Docetaxel is more effective than monotherapy [18]. Therefore, the aim of the current study was to determine whether the combination of Anvirzel™ and Cisplatin was more effective than the use of either drug alone using MTT chemosensitivity assays based on human cancer cell lines [19-23].

Methods

The human carcinoma cell lines used were obtained from the ECACC-HPA (European Collection of Cell Cultures - Health Protective Agency, UK). PC3, LNCaP and 22Rv1 are human prostate cancer cell lines, MDA-MB 231, T47D, and MCF-7 are human breast cancer lines, CALU-1, COLO699N and COR-L 105 are non-small cell lung carcinoma lines (NSCLC), HCT-116, HT55 and HCT-15 are colorectal cancer lines, and A375 and PANC-1 are melanoma and pancreatic cancer cells

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