In vitro anticancer effects of 1,2,4-triazole-3-carboxamides

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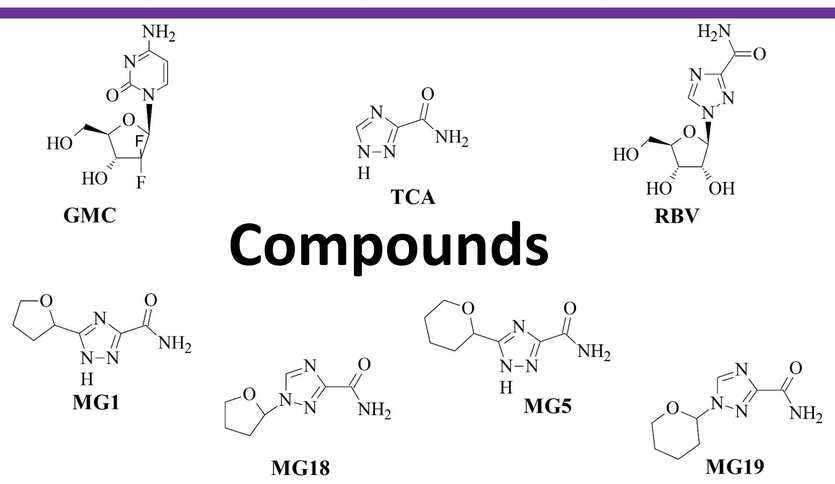
Introduction

Ovarian cancer (OVC) is a current health problem for women around the world. The high mortality rate from OVC makes the development of new therapeutic drugs relevant. Ribavirin (RBV, chemical name 1,2,4-triazole-3-carboxamide) is commonly used as an antiviral agent. In recent years, research has focused on repurposing RBV as an anticancer drug. However, RBV reveals a number of side effects, therefore, synthetic derivatives of 1,2,4-triazole-3-carboxamide (TCA) are being actively developed and tested as putative anticancer drugs.

The main goal of the present study is to estimate the anticancer effects of RBV, TCA and its derivatives (MGs) *in vitro*.

Compounds



Methods

Cytotoxic effect of the MGs on ovarian cancer cells (OVAR3 and OVAR4) was assessed using the MTT assay. The proliferation rate of OVC cells was assessed after 72 h of treatment RBV, TCA and MGs cell by direct cell counting with trypan blue exclusion. Distribution of cell cycle phases was evaluated using flow cytometry with PI staining.

Results

RBV and MGs induced 40% cell death in OVC cells. MGs inhibited proliferation by 50-70% in OVC cells. After 72h RBV and MGs induces S-phase stunting. Furthermore, we demonstrated an increase in the number of cells in the subG1 phase (2.5%) after treatment with TCA and MG1, as well as in G2/M-phase (10%) after treatment with MG5.

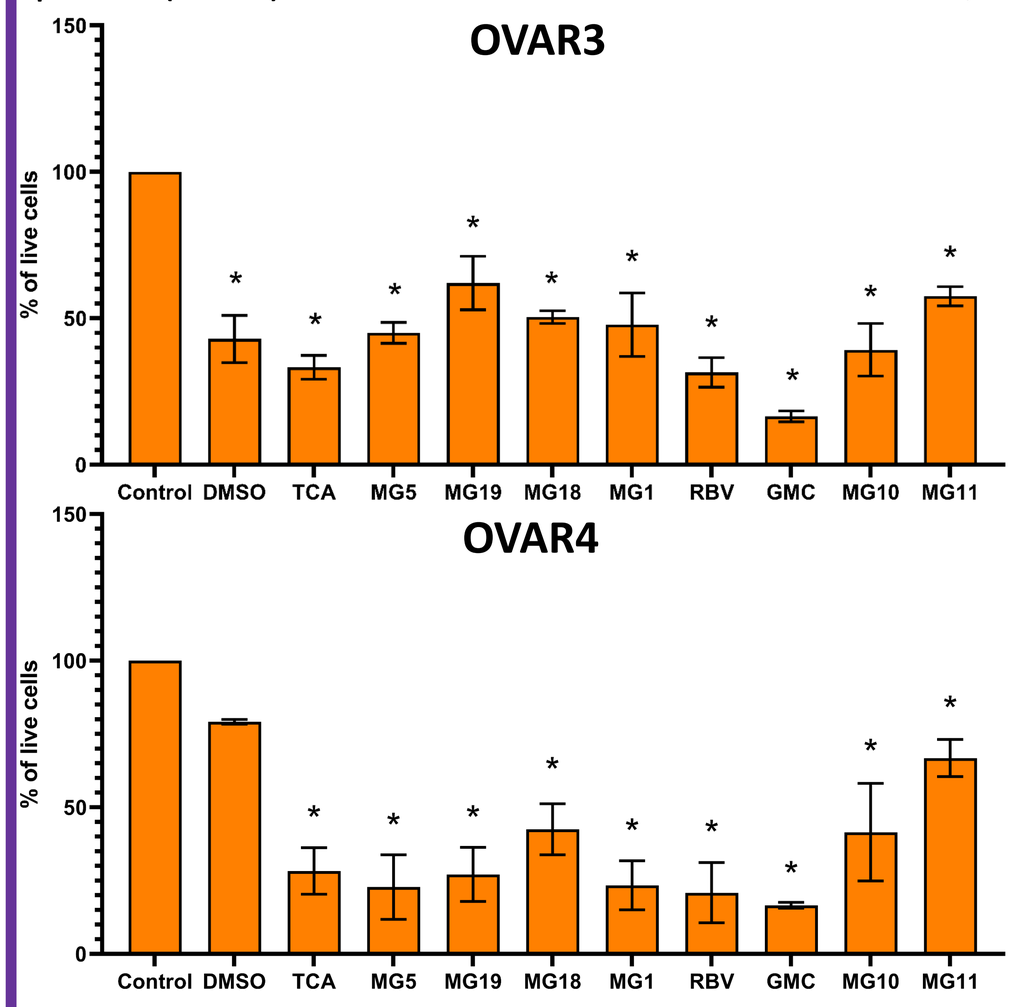


Fig. 1. Antiproliferative effects. * - Statistically significant differences as compared to control ($p<0.05$)

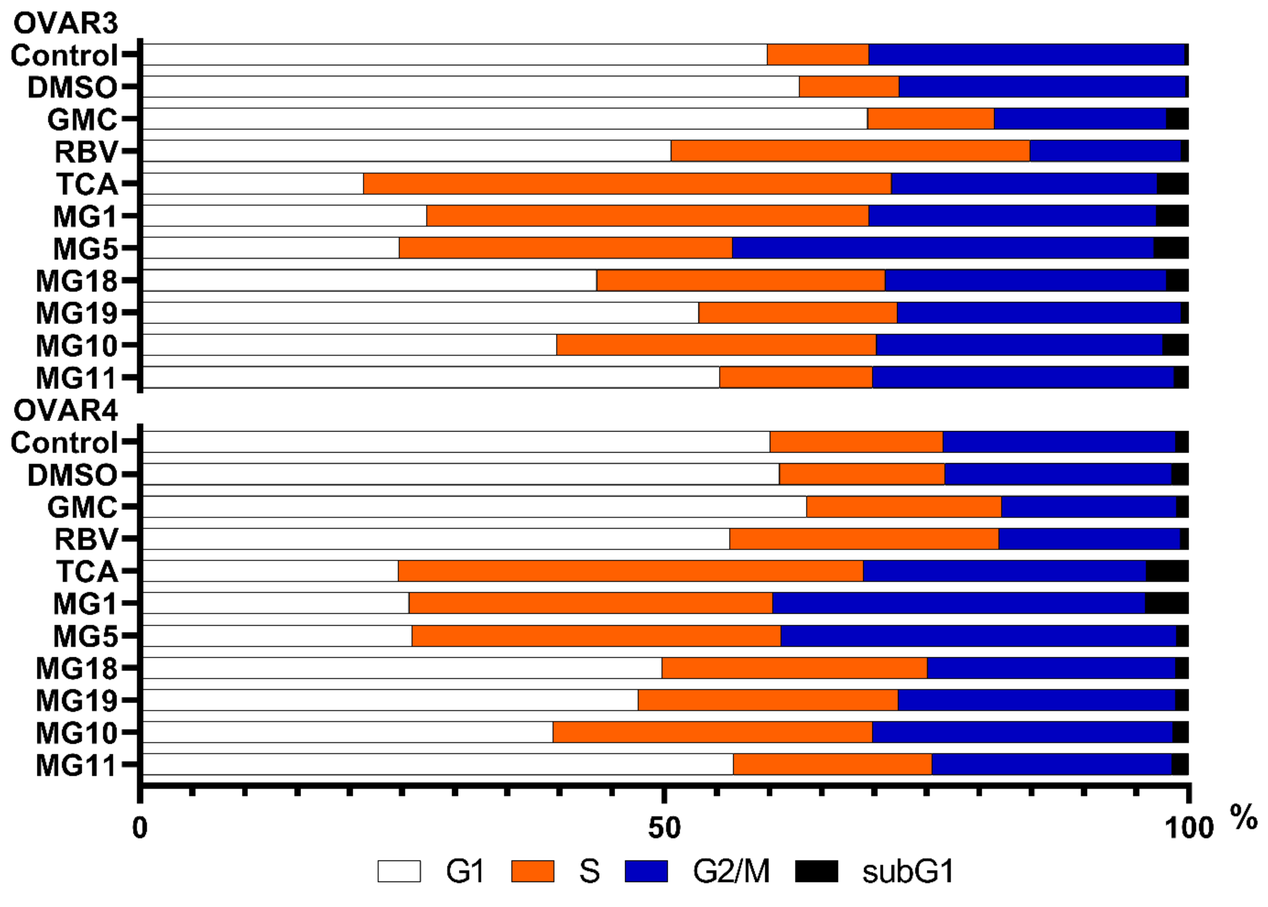


Fig. 2. Cell cycle progression of ovarian cancer cells cultured with solvent, GMC, RBV, TCA and MGs

Conclusions

1,2,4-triazole-3-carboxamides inhibit proliferation and induce apoptosis *in vitro*. These results provide the rationale for further studies of 1,2,4-triazole-3-carboxamides as potential anticancer drugs.

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