

Report of "Research Award of Oral Sciences"

Major: Oral Sciences

Grade: 1 year

Department: Oral medicine

Name: Ding Cheng

Title: Development of novel chemotherapy for oral cancer: enhancement of antitumor effects by using vitamin E

1. Aim of research and results obtained

Chemotherapy, one of the most effective treatments for oral cancer, has achieved significant progress in the treatment of many malignant tumors that were considered fatal previously. Previously, chemotherapy was widely used for palliative treatment, post-operation, and in advanced stages of cancer. However, chemotherapy-induced adverse effects and complications are not uncommon. Therefore, novel ameliorative chemotherapy for oral cancer is need. Vitamin E, an essential nutrient which can be easily derived from dietary sources, can affect many signaling pathways in cancer cells, including NF-kB-mediated pathways, Akt/PKB, Raf/Erk and c-jun N-terminal kinase -related pathways. Besides, Vitamin E can also act as the mediators of many cellular processes including the reduction of DNA damage, activation of apoptosis, induction of cell cycle arrest, stabilization of the proteasome, and downregulation of telomerase activity. Hence, we decided to investigate the mechanisms in the antitumor effects of γ -tocotrienol, one kind of Vitamin E, and docetaxel, which was widely used in the treatment of cancers.

After one year's experiment, the outcomes that we have got met our expect result. Firstly, we determined the optimal concentration of docetaxel and γ -tocotrienol, in which the growth of cancer cells (B88 cell-line) were almost not affected, through in vitro cell growth assay. Then, we got the satisfying result that the combine treatment of γ -tocotrienol and docetaxel apparently enhanced the antitumor effect of docetaxel. Since then, further study was conducted. Before co-treatment of γ -tocotrienol and docetaxel, we added a pretreatment of γ -tocotrienol or docetaxel, respectively. We found that both these two research group had further enhance anticancer effects compared with single co-treatment.

After that, we attempted to study and understand the mechanisms of these consequences. The ELISA of p53, which is a critical molecule in the process of apoptosis, shows different results, when comparing these two groups, pre-treatment of γ -tocotrienol and docetaxel, separately. The group, which performed the pre-treatment of γ -tocotrienol, can hardly detect the existence of p53. Then why cells still showed apoptosis after performing pre-treatment of γ -tocotrienol became our main focus point. To study if the process of apoptosis is related to Oxidative stress, we are doing the luminescence to measuring H₂O₂, a product of oxidative stress.

2. Self-evaluation of research achievement:

We have got some certain satisfying research data, and it generally meet the expect result, but there still have a long way for us to thoroughly understand the mechanisms of the enhance antitumor effect of γ -tocotrienol. The following step is to perfect the whole research framework and study forward details of the experiment.

3. Meeting presentation:

* Title, conference, venue, date, co-author, presentation (oral/ poster).

(Underline the speaker.)

None

4. Journal publication:

* Title, journal, volume, number, paragraph, date, co-author.

(Underline the speaker.)

None