Luteolin as a glycolysis inhibitor offers superior efficacy and lesser toxicity of doxorubicin in breast cancer cells.

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Abstract
Luteolin (Lu) exhibits a wide spectrum of anti-tumor activities, the present study was to observe whether Lu can sensitize breast cancer cells to doxorubicin (Dox) and to explain the basis underlying this phenomenon. In vitro, Lu at dose less than 100 microM had only slight effect on cells growth and cytotoxicity of Dox in 4T1 and MCF-7 cells under normoxia, but it could reverse tumor resistance to Dox and promote death of tumor cells under hypoxia. In vivo, Lu alone had also no effect on tumor growth delay, however, it could offer superior efficacy and lesser toxicity of Dox in 4T1 and MCF-7 bearing mice. Further study showed that Lu was able to suppress glycolytic flux but did not affect glucose uptake, the P-glycoprotein, anti-oxidative enzymes under hypoxia in vitro, and had not also effect on the intratumor Dox level in vivo. In addition, the activity of SOD and CAT was increased in serum and was decreased in tumor by Lu in vivo. These results suggest that luteolin as a glycolytic inhibitor might be a new adjuvant agent for chemotherapy.

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