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Mitigating doxubicin induced cardiotoxicity using natural products

Deepa A. Rao
Pacific University, USA

Doxorubicin (DH), an anthraquinone antibiotic is an effective anticancer agent that is used in the treatment of various solid tumors. However, the drug's lifetime is limited due to the cardiotoxicity. One of the postulated mechanisms of the induction of doxorubicin cardiotoxicity is the redox cycling of the quinolone ring. We postulate that pairing of this drug with appropriate natural products with known antioxidant properties will help partially or fully reverse the doxorubicin induced cardiotoxicity. Natural products like resveratrol (RES), quercetin (QUE), and curcumin (CUR) have demonstrated strong free radical scavenging abilities. In addition, RES and QUE are being currently investigated as natural products that can induce endogenous free radical scavenging agents. However, all these natural products are limited by their low bioavailability and therefore a formulation is needed to overcome their delivery issues and enhance their effectiveness. The goal of this project is to pair one or more of these natural products *in vitro* to determine the best ratio of achieving cardioprotection without interfering with the cytotoxicity of doxorubicin. Our results indicate that RES:QUE:DH 10:10:1 ratio RES:CUR:DH at 10:2:1 ratio as individual drugs and in micelles are cardioprotective in cardiomyocytes while being synergistic ovarian cancer cells. The data will be presented and the postulated mechanisms of rescue in terms of the reactive oxygen species will be discussed.

Biography

Deepa A. Rao has completed her B.S. in Pharmacy from St. John's University, NY, Ph.D. from University of Wisconsin-Madison and postdoctoral studies from the University of Wisconsin-Madison. She is an assistant Professor at Pacific University, School of Pharmacy in Oregon. She has several peer-reviewed poster presentations and publications and serves as an *ad hoc* reviewer for several journals.

deeparao@pacificu.edu