Novel Nanomedicine Therapy for Multidrug Resistant Cancer

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Multidrug-resistant (MDR) cancer decreases the effectiveness of chemotherapy. One primary cause is the overexpression of P-glycoprotein efflux pump (P-gp). Mitotane (MIT) is a very potent P-gp inhibitor, which increases drug accumulation in cancer cells. Doxorubicin (DOX) is a first line anticancer drug against various cancers, such as prostate, bladder, lung, breast, etc. In order to combat MDR prostate cancer, a combination therapy of doxorubicin (DOX) and mitotane (MIT) was investigated. The anticancer effects were determined in vitro with a MTT cell viability assay. Compared to the DOX-only therapy, the DOX plus MIT treatment yielded a significant decrease in cell viability. After DSPE-PEG2000 micelles were loaded with DOX and MIT, the treatment showed a greater reduction in cell viability than the micellar-DOX monotherapy. The DOX + MIT treatment possesses great potential for reversing MDR cancer, especially in conjunction with micelles.

Awards Won: