Lights, Nanocarrier, Crosslink! A Novel Nanocarrier for Drug Delivery in Cancer Treatment

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Nanotechnology has played a significant role in modern medical application. Nanocarriers are able to deliver the chemotherapeutic drugs and deliver them specifically to the targeted cells. Although nanocarriers can prematurely release their cargo due to the dynamic state, cross-linking prevents that from occurring. The novel nanocarrier X-41 contained paclitaxel (PTX), a very effective anticancer drug with serious side effects caused by unspecific targeting. Both the cross-linked (C-X-41) and non-cross-linked X-41 were tested on the noncancerous ovary cell line CHO and the lung cancer cell line A549, with some A549 groups treated with glutathione (GSH). X-41 containing PTX (X-41:PTX) was effective at affecting A549 cell viability at 33 ng/mL, the same concentration as PTX on its own. Additionally, PTX significantly reduced CHO cell viability at 330 ng/mL while X-41:PTX was nontoxic to CHO cells until 8250 ng/mL. Due to the lack of toxicity of X-41 on CHO cells and toxic effect on A549 and A549 with GSH cells, X-41 is a potential nanocarrier for anticancer drug delivery that would allow the bypass of harmful chemotherapeutic side effects.

Awards Won:
Fourth Award of $500