Thermally-responsive elastin-like peptides for improving the efficacy of anticancer agents

Unmet Need

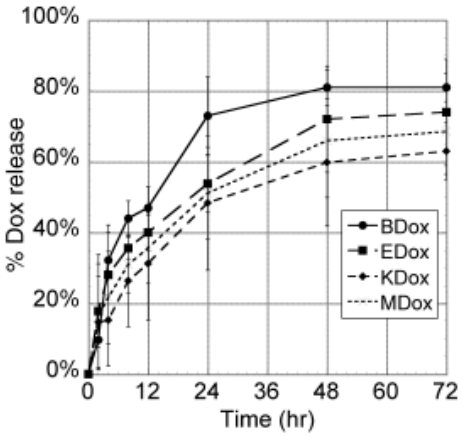
The goal of chemotherapy is to deliver an anticancer agent, typically a small molecule, at a high dose to a tumor to kill rapidly proliferating tumor cells. Unfortunately, the maximum dose of many chemotherapeutic agents is limited by their high levels of systemic toxicity in normal tissues, so that the administered dose is frequently sub-optimal for effective therapy. Insufficient *in vivo* efficacy can be manifested in a variety of ways, such as low bioavailability of the active compound, a short half-life of the active compound, and high systemic toxicity of the active compound. To avoid eliminating otherwise promising drugs from clinical use, there remains a need for new approaches to enhancing the *in vivo* efficacy of active compounds in their delivery to human and animal subjects.

Technology

Duke inventors have reported a drug delivery method for improving the half-life of anticancer agents, such as doxorubicin, paclitaxel, cis-platinum, and combrestatin. Elastin-like peptides (ELPs) are conjugated to the chemotherapeutics using a pH-sensitive linker. The increased half-life of ELP conjugates has been demonstrated using radionuclide studies.

Advantages

- ELP can be conveniently synthesized in high yield as a monodisperse macromolecule by recombinant DNA synthesis methodologies
- The molecular weight of ELPs can be precisely tailored to provide an increased local concentration of an ELP–drug conjugate in the



tumor compartment

- ELPs are thermally responsive biopolymers that undergo an inverse phase transition, which results in thermal targeting of tumors

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Meet the Inventors

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Biomedical Engineering (BME)

Publication(s)

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External Link(s)

• From the lab of Dr. Ashutosh Chilkoti