

RAPID PEG-BASED DRUG DELIVERY IMPLANT FOR LOCAL TREATMENT OF CERVICAL CANCER

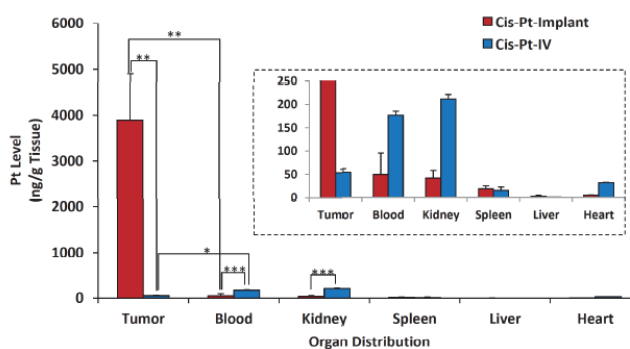
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Technology Description

Researchers in Prof. Kareem Azab's laboratory have developed a fast, localized drug delivery system designed to maximize anti-tumor efficacy and reduce side effects by delivering chemotherapy directly to cervical tumors.

The current standard-of-care treatment regimen for cervical cancer includes systemic cisplatin chemotherapy in combination with radiation treatment via brachytherapy. However, systemic drug delivery does not enable a sufficient dose to be delivered to the tumor and has dose-limiting toxicities. This invention solves that problem with a polymeric drug delivery implant that can rapidly deliver high doses of highly toxic drugs such as cisplatin directly to the cervical tumor while lowering drug accumulation elsewhere. This PEG-based implant can be placed inside the cervix where the polymer formulation quickly dissolves to release its chemotherapy payload in 30-60 minutes. This could potentially offer a convenient option for patients to receive their chemotherapy in conjunction with their brachytherapy appointment. Furthermore, the implant can promote delivery to deeper parts of the cervical tumor than conventional local delivery techniques. This technology has great potential as a sole therapy or radiation adjuvant to improve patient outcomes by enhancing local tumor control while reducing side effects.



In vivo biodistribution of localized cisplatin implant vs. systemic IV 24 hours after drug delivery

Stage of Research

In vivo biodistribution studies in a mouse model demonstrated: total inhibition of tumor progression with 73-fold higher accumulation of cisplatin in the tumor with PEG-implant compared to IV injection and significantly lower accumulation in blood, kidney and other organs.

Applications

- **Drug delivery for chemotherapy** – localized treatment for cervical cancer as a sole therapy or in conjunction with radiation therapy/brachytherapy

Key Advantages

- **Effective dosing with reduced toxicity** – local delivery inside cervical cavity:
 - increased drug specificity for the tumor >70-fold compared to systemic delivery
 - significantly decreased accumulation in blood and nearby organs to limit side effects
 - completely inhibited tumor progression in mouse models
 - delivers drug closer to tumor, unlike conventional local delivery systems that are placed on the external side of the cervix
- **Fast delivery for convenient administration:**
 - potential to reduce number of visits by delivering chemotherapy during the same appointment as standard-of-care brachytherapy
 - biodegradable material does not require a visit for removal

Patents: Application filed

Related Web Links: Kareem Azab ([profile](#), [lab](#))