Doxorubicin

Doxorubicin, sold under the brand name Adriamycin among others, is a chemotherapy medication used to treat cancer.

This includes breast cancer, bladder cancer, Kaposi's sarcoma, lymphoma, and acute lymphocytic leukemia.

It is often used together with other chemotherapy agents.

Doxorubicin is given by injection into a vein.

Dobashi et al. proposed and demonstrated a novel in situ microcatheter-based photomodulated extrusion approach capable of dynamically tuning the physical and morphological properties of injectable hydrogels, optimizing for the local hemodynamic environment and vascular morphology. A shear-thinning and photoactivated PEGDA-nano silicate (PEGDA-nSi) hydrogel is used to demonstrate multiple extrusion modes which are controlled by photokinetics and device configurations. Real-time photomodulation of injected hydrogel viscosity and modulus is successfully used for embolization in various vasculatures, including high-flow large vessels and arterial-to-arterial capillary shunts. Furthermore, a generalizable therapeutic delivery platform is proposed by demonstrating a core-shell structured extrusion encapsulating doxorubicin to achieve a more sustained release compared to an unencapsulated payload [1)]

IL13 conjugated liposomal doxorubicin was formulated and shown to bind and internalized in the MPNST cell culture model demonstrating cytotoxic effect. Our subsequent in vivo investigation in the STS26T MPNST sciatic nerve tumor model indicated that IL13 conjugated liposomal doxorubicin (IL13LIPDXR) was more effective in inhibiting tumor progression compared to unconjugated liposomal doxorubicin (LIPDXR). This further supports that IL13 receptor targeted nanoliposomes is a potential approach for treating MPNSTs [2)].

Tumor cell seeding in the needle track during percutaneous needle biopsies has been reported for various types of cancers. The mechanical force of the biopsy both directly displaces the malignant cells and causes bleeding and fluid movement that can further disseminate cells. To prevent the risk of tumor cell seeding during biopsy, Bai et al. developed a gelatin stick loaded with chemotherapeutics such as doxorubicin (DXR) that was inserted into the biopsy canal. The gelatin-doxorubicin sticks (GDSs) were created by passively loading precut gelatin foam strips (Gelfoam) with doxorubicin solution. The dried GDSs were inserted into the needle track through the sheath during

the needle biopsy and eventually self-absorbed. We showed that this procedure prevented iatrogenic tumor seeding during needle biopsies in two subcutaneous tumor models. In an alternative application, using GDSs in intracranial brain tumor implantation avoided the outgrowth of tumor from the rodent brain, which could otherwise potentially fuse the tumor with the meninges and distort the results in therapeutic studies in rodent brain tumor models [3].

1)
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2)
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3)
Bai RY, Staedtke V, Xia X, Riggins GJ. Prevention of tumor seeding during needle biopsy by chemotherapeutic-releasing gelatin sticks. Oncotarget. 2017 Feb 16. doi: 10.18632/oncotarget.15427. [Epub ahead of print] PubMed PMID: 28412733.