Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Lipid Derivatives For Drug Delivery

Product

PEGylated nanoparticles

Indication

Drug delivery system to tumors and skin pathologies

Value Propositions

- Method for delivering therapeutics to hard-to-reach tumors
- Favorable and prolonged accumulation in target tissues
- Adaptable to various drugs and imaging agents

Market

- $8.9 billion—Global drug delivery systems in cancer market (17.4% CAGR 2020-2028)

Intellectual Property

- Provisional patent pending*
- Available for licensing

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Background on CU5648H

Among solid tumors, gliomas are the most devastating and aggressive brain tumor in adults and children, with a median survival of only 14.6 months. Hidden behind the blood-brain (BBB) and blood-tumor barriers (BTB), gliomas, especially at the invasive edge, are not readily accessible to a majority of drug therapeutics creating a need for novel drug delivery systems targeting the cancerous tissue.

Technical Innovation

Our inventors have created nano-formulated, fluorescent indocarbocyanine lipids to improve delivery of therapeutic agents to tumor and tumor-associated immune cells.

The concept has been tested and validated in vitro and in vivo where the novel compound out-competed DOXIL, a standard chemotherapeutic, in terms of penetration and accumulation in glioma models. The primary advantage of this technology is the ability of the PEGylated liposomes and nanoparticles to efficiently cross the BTB/BBB and accumulate in targeted tumor and immune cells for prolonged. periods of time. The compounds spread and stay in these tissues more efficiently than corresponding fluorescent phospholipids and common therapeutic compounds. Therefore, these novel conjugated delivery systems can be used to improve the delivery of drugs, biologics and imaging agents to these tissues.

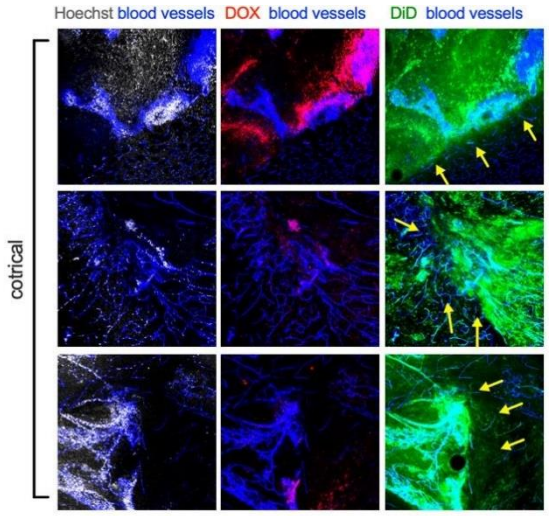

Figure: Lipid nanoparticle accumulation at the invasive edge compared to Doxil.

***Provisional Patent**-"Indocarbocyanine Lipid Derivatives for In Vivo Cargo Delivery". Filed June 2021.*