**ABSTRACT**

Despite substantial chemotherapeutic advances in the 21st century, toxicity remains a prevailing obstacle to cancer treatment. Previously, the Lacko Lab has shown that scavenger receptor B1 (SR-B1) overexpression is a hallmark of several cancers. The natural ligand of this receptor is circulating HDL, whose wildtype action is the receptor-mediated delivery of cholesterol in an apolipoprotein A1-dependent manner (1). In this study, a dual P13K/mTOR inhibitor was incorporated into reconstituted high density lipoprotein (HDL) nanoparticles, and subsequently tested against a panel of glioblastoma multiforme (GBM) cell lines. The mean diameter of the nanoparticles were 15.7 nm with a standard deviation of 4.5 nm and a polydispersity index of 0.160. Drug concentration of 73.35 µM. These nanoparticles provided an appreciable protective effect against astrocytes while having an IC50 value of 103 nM against GBM line LN229.

**RESULTS**

**PROPOSED MECHANISM**

General Overview:

- Drug Incorporated nanoparticles are released/injected into cancer cells
- The nanoparticles bind to the SR-B1 receptor in an ApoA1-mediated mechanism
- Receptor mediated delivery of core components
- Via Trojan horse strategy, cell apoptosis is the expected response

**DYNAMIC LIGHT SCATTERING**

Particle size was measured via Dynamic Light Scattering with a Delta-NanoZ. Figure 1 displays the general shape and structure of the lipoprotein nanoparticles after they are constructed. Figure 2 displays the percentages of the different components that made up the nanoparticles that were created in this lab. These percentages were found via BCA/phospholipid/cholesterol assays.

**PARTICLE SYNTHESIS**

- XLogP3: 5.2
- "Dual ATP-competitive P13K and mTOR inhibitor (4)"

**PARTICLE CHARACTERIZATION**

- LN229 morphology
- A1-dependent

**CYTOTOXICITY DATA**

Survival Curve of GBM line LN229 against HDL

**REFERENCES**


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