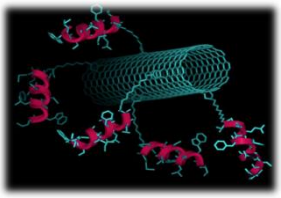

2016 NanoBio Summit

Auburn University – Student Center, Auburn, AL

Wednesday & Thursday, October 13-14, 2016

AUBURN UNIVERSITY

ABSTRACT TEMPLATE

Abstracts for presentation at the 2016 NanoBio Summit are being solicited from all attendees. Abstracts should include title, authors with each of their institutions identified, and purpose, methods, results and conclusions. There is a ***350-word limit*** on all abstracts, not including title, authors and affiliations. Abstracts should be types in Microsoft Word, Times New Roman 10 font as shown below. The presenting author(s) should be underlined.

***All abstracts should be emailed to nanobiosummit2016@auburn.edu prior to Sept 19 for consideration. Presenters must be registered to have abstract accepted for presentation.

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Example of Abstract

Evaluation of in vitro and in vivo intracellular uptake and degradation of sPLA2 responsive liposome in prostate cancer by LC-MS/MS

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Purpose: Secretory phospholipase A2 (sPLA2) are increased in various cancers. The lipid specificity and reactivity of sPLA2 and its ability to interact with PLA2 receptors (PLA2R) are potential targets for development of liposome drug delivery system. However, many phospholipids used to prepare liposomal formulations can be found endogenously and have biological isomers that complicate quantitative analysis.
Methods: In these studies, we incorporated deuterated lipids in our sPLA2 responsive liposomes (SPRL) and developed an acidified Bligh-Dyer extraction method in combination with liquid chromatography tandem mass spectrometry (LC-MS/MS) to evaluate their intracellular uptake and degradation in prostate cancer. Deuterated (d70) - 1,2-distearoyl-sn-glycero-3-phosphocholine (d70-DSPC) was used as a substitute for DSPC to increase the uniqueness of SPRL formulations. An acidified Bligh-Dyer extraction in combination with LCMS/MS was used to quantify and track the deuterated parent phospholipid (d70-DSPC) and one of its metabolites (d35-LysoPC). The ability to distinguish and quantify d70-DSPC from tumor samples was determined using a mouse xenograft model of human prostate adenocarcinoma (PC-3) cells implanted subcutaneously in athymic NCr (nu/nu) mice.
Results: The LC-MS/MS chromatograms showed no interfering peaks from endogenous phospholipids with d70-DSPC and d35-LysoPC and had lower limits of quantification of 2 pg (S/N > 10) on column. Analysis of LC-MS/MS results showed an accumulation of SPRL in tumor based on the quantification of d70-DSPC and its metabolite d35-LysoPC. The uptake of liposome was coordinated to drug (doxorubicin) disposition. PLA2R knock-down resulted in a significant ($p<0.01$) decrease in the uptake of SPRL based on LC-MS/MS quantification. The observed decrease further supports the role of PLA2R in the intracellular uptake of SPRL.
Conclusion: The use of deuterated lipid, such as d70-DSPC, along with its metabolite was used as a MS probe to directly quantify the uptake and degradation of different liposome nanoparticle. This method strengthens the ability to evaluate and optimize lipid-based drug carriers such as liposomes. Such tools are critical to gaining mechanistic insights into the distribution and intracellular fate of nanomedicines