Supplementary Materials:

Characterization of Nanoparticles

In this study, DNPs had mean diameters above 120 nm and were too large to be taken up by the cell membrane passively, according to existing literature [1]. The antibody conjugation onto DOX loaded nanoparticles caused a notable increase in its particle size. This observation is consistent with literature [2]. Thus, it is likely that the nanoparticles (DNPs and ADNPs) are taken up through endocytosis, and a similar study showed that particles smaller than 200 nm are generally endocytosed by clathrin-coated pits [3] which exhibit a slow rate of cell processing [4].

Cell Proliferation Data Analysis

The following formulas were used to calculate net growth:

(1) (Tx - To)/(C - To) * 100 if Tx > To, and

(2) (Tx - To)/To * 100 if Tx < To.

To is defined as the initial amount of cells. Tx corresponds to the absorbance of wells with different treatments, and C is the absorbance of the control wells. Net growth was plotted against DOX NPs concentration to show toxicity effects as described by Monks et al [5]. If Tx > To, the treatment is considered as growth inhibition; if Tx < To, there is no net growth after the treatment, and so its effect is considered as cell killing.

Cytotoxicity Data for Void PLGA NPs

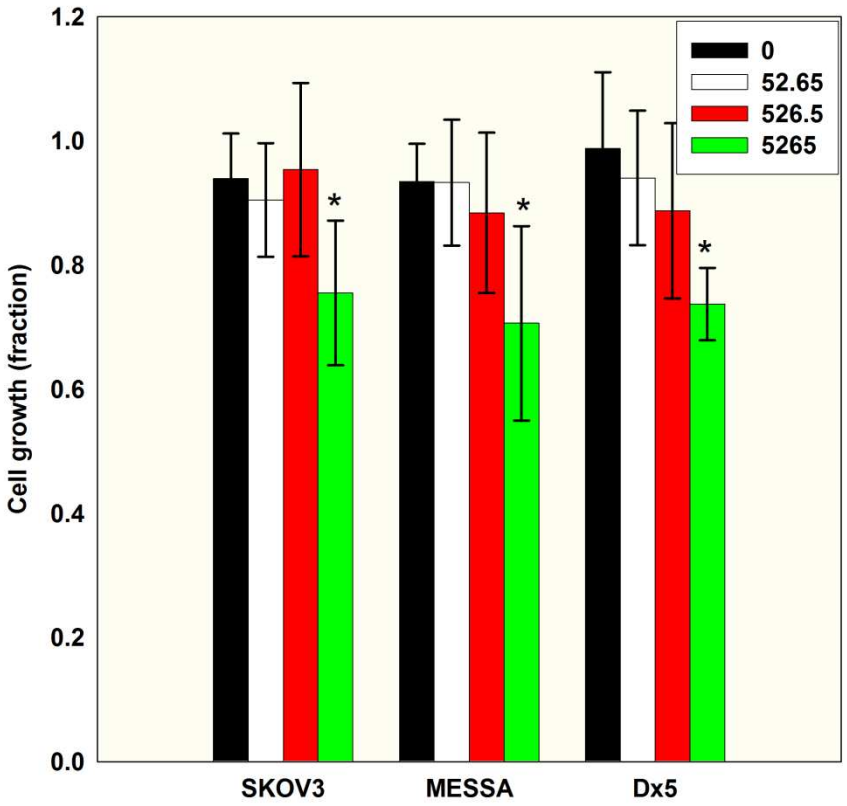

Figure 1. "Cell Growth vs. PLGA NPs concentration', n = 4 experiments, 4 wells per treatment. *P < 0.05 (by paired t-test) between samples and control, indicating significant difference due to high concentration of nanoparticles. The unit of PLGA NPs concentration is µg/ml.

References:

1. Scott, C. J., W. M. Marouf, et al. (2008). "Immunocolloidal targeting of the endocytotic siglec-7 receptor using peripheral attachment of siglec-7 antibodies to poly(lactide-co-glycolide) nanoparticles." Pharmaceutical Research 25(1): 135-146.

2. Sun B, Ranganathan B, Feng SS. Multifunctional poly(D,L-lactide-co-glycolide)/montmorillonite (PLGA/MMT) nanoparticles decorated by Trastuzumab for targeted chemotherapy of breast cancer. Biomaterials 2008; 29(4): 475-486.

3. Rejman, J., V. Oberle, et al. (2004). "Size-dependent internalization of particles via the pathways of clathrin-and caveolae-mediated endocytosis." Biochemical Journal 377: 159-169.

4. Zuhorn IS, Kalicharan R, Hoekstra D. Lipoplex-mediated transfection of mammalian cells occurs through the cholesterol-dependent clathrin-mediated pathway of endocytosis. J Biol Chem 2002; 277(20): 18021-18028.

5. Monks, A., D. Scudiero, et al. (1991). "Feasibility of a High-Flux Anticancer Drug Screen Using a Diverse Panel of Cultured Human Tumor-Cell Lines." Journal of the National Cancer Institute 83(11): 757-766.

List of Abbreviations and Abbreviated Terms:

Bicinchonic acid (BCA)

Doxorubicin (DOX)

DOX-loaded NPs (DNPs)

Dimethylsulfoxide (DMSO)

Dichloromethane (DCM)

Dynamic light scattering (DLS)

DOX and ICG loaded PLGA NPs (ICG-DOX-PLGANPs)

Fetal bovine serum (FBS)

Human ovarian cancer cell lines (SKOV-3)

Human uterine drug resistant cell line (MES-SA/Dx5)

Human Epidermal Growth Factor Receptor 2 (HER-2)

Human uterine drug sensitive cell line (MES-SA)

HER-2 antibody conjugated DOX-loaded NPs (ADNPs)

Indocyanine Green (ICG)

MES-SA/Dx5 (Dx5)

Multi-drug resistance (MDR)

Molecular Weight (MW)

Nanoparticles (NPs)

N-(3-Dimethylaminopropyl)-N′-ethylcarbodiimide hydrochloride (EDC)

N-Hydroxy succinimide (NHS)

Poly (D, L- lactide co-glycolide) (PLGA)

P-glycoprotein (P-gp)

Phosphate Buffered Saline (PBS)

Polyvinyl alcohol (PVA)

Photomultiplier tube (PMT)

Sodium dodecyl sulphate (SDS)

Sodium Hydroxide (NaOH)