Docetaxel Loaded PLGA Nanoparticles for Tumor Specific Drug Delivery

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Safe, efficient and viable drug delivery is important in tumor targeted drug delivery systems. Nanocarriers, such as poly(lactic-co-glycolic acid) (PLGA) nanoparticles, is one system being researched to deliver chemotherapeutic drugs to tumor sites without affecting normal, healthy cells. To allow the delivery system to pass through the body, nanoparticles are coated in albumin, the most abundant protein in the body. Choosing an effective drug that will stay within the nanoparticle is one point of interest. Doxetaxel, a chemotherapy drug, had been proved to have a loading efficiency (mass of drug in nanoparticles per mass of nanoparticles) of 2% within nanoparticles. The goal of this study is to increase this loading efficiency to 5%. With manipulations to different variables, the highest loading efficiency I have reached is 1.5%. After obtaining a reasonable loading efficiency, the PLGA loaded nanoparticles can be coated with albumin and the cytotoxicity can be determined within cancer cells, in vivo and in vitro.