**Synthesizing Cleavable Acetal Antibody Drug Conjugates**

There is a need for cancer treatment to be exclusively targeted towards cancerous tissue and thus innocuous towards regular tissue; antibody drug conjugates (ADCs) are a method that utilize a monoclonal antibody (mAb) for targeting cancerous tissues, a drug for its cytotoxic effects, and a small molecule linker to connect the two and specifically release the cytotoxic payload at its intended target. While the theoretical benefits behind them are strong, ADCs lack diverse cleavage methods to deliver their carried drugs. One mechanistic approach for drug delivery would be cleavage of an ADC based on the acidic environment found in cancerous cells (pH = 5.5 in cancerous cells, compared to 7.2 in the systemic circulation). Therefore, the acetal functionality was explored as a novel cleavage mechanism because of its hydrolytic propensity in acidic environments. Two small organic molecule linkers were designed and partially synthesized with the purpose of conjugating chromophores (2,4-dinitrophenyl) to cancer specific mAb to explore the acetal moiety in cellular cancer models, and a non-cleavable small molecule linker was synthesized to develop biological assays for characterizing the designed ADCs. Future studies will evaluate the acetal chemistry for linking cytotoxins in the place of chromophores as cancer therapies.