Towards purification of antibodies with light

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Poster Presentation Abstract:

One of the most common method to purify a particular antibody is done by affinity chromatography. Antibody binding proteins such as Protein A are used to purify antibody from the mixture of proteins and antibodies. The main objective of my project is to design a new method that utilizes light-responsive (LR) affinity-capture ligands for antibody purification. This would vastly improve the quality of purification of the antibodies. Using the LR affinity-capture ligands to purify the antibody can be widely applied to many fields related to biotechnology, life science industry, and pharmaceutical industry. To achieve this, we designed the LR cyclic peptide as affinity ligand that recognizes the constant region (Fc) of the antibody we want to purify. We began with octapeptide sequences that was known to have an affinity to the Fc region of IGg antibody. The octapeptide was attempted to react with the LR azobenzene linker 3, 3'-bis(sulfonato)- 4,4'-bis(chloroacetamido)-azobenzene (BSBCA) to create a macrocyclic product, LR-macrocycle peptide. We hypothesized that the LR-macrocycle peptide will have two geometric isomers: one isomer with higher affinity and one isomer with lower affinity towards the Fc region. The peptides were immobilized on paper for observing the affinity difference of two isomers towards the Fc region of the antibody. The data obtained from preliminary study suggested that the LR-macrocycle peptides had different affinities between the two isomers. To further understanding the system, we will be validating the affinity differences of those ligands and will be optimizing the peptide sequences to increase the efficiency of the technique.

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