

Efficient Synthesis Methods of Polysaccharide-Polypeptide Copolymer

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Abstract:

In our research we aim to bridge the gap between protein- and carbohydrate-based block copolymer systems to engineer a novel family of mono/polysaccharide-*block*-polypeptide copolymers capable to undergo self-assembly in aqueous environment. Our model system will consist of protein sequences found in native spider dragline silk and carbohydrate moieties based on β -D-glucopyranose monomeric units to provide the polymer building blocks and components for the planned studies: to assess relationships between the sequence designs and morphological and structural features. This paper addresses the design and synthesis of Glucose-co-Glycine material with different methods as a starting. An efficient method to synthesis may not always be a convenient method since using the method resulted in the best yield does not always mean that it can be resulted in the best reproducible way. In this paper glucose-co-glycine is synthesized with two different methods to compare the ups and downs of each method. The resulting material can be a start point to synthesize bigger copolymers with the desired aspects using the preferred method for the specific need. The combination of click reaction and conjugation reaction with different orders has been used in this paper. In “strategy 1” first click reaction and second conjugation reaction have been tried but in “strategy 2” it was vice versa, first conjugation reaction and then click reaction have been tried. Our results showed that the first strategy would be resulted in better yield in terms of purity and higher weight despite the fact that the second strategy is more reproducible way.