

## Fall Chemistry Poster session (2020)

### Sensitive Oligodeoxynucleotide Synthesis Using Dim and Dmoc as Protecting Groups

#### Abstract

In traditional oligodeoxynucleotide (ODN) synthesis, phosphate groups are protected with 2-cyanoethyl group, and amino groups are protected with acyl groups. At the end of ODN synthesis, deprotection is achieved with strong bases and nucleophiles. Therefore, traditional technologies are not suitable for the synthesis of ODNs containing sensitive functionalities. To address the problem, we report the use of Dim and Dmoc groups, which are based on the 1,3-dithian-2-yl-methyl function, for phosphate and amine protection for solid phase ODN synthesis. Using the new Dim-Dmoc protection, deprotection was achieved under mild oxidative conditions without using any strong bases and nucleophiles. As a result, the new technology is suitable for the synthesis of ODNs containing sensitive functions. To demonstrate feasibility, seven 20-mer ODNs including four that contain the sensitive ester and alkyl chloride groups were synthesized, purified with RP HPLC and characterized with MALDI-TOF MS and enzyme digestion essays. High purity ODNs were obtained.

#### Reference

Shahien Shahsavari, Dhananjani N. A. M. Eriyagama, Jinsen Chen, Bhaskar Halami, Yipeng Yin, Komal Chillar and Shiyue Fang "Sensitive Oligodeoxynucleotide Synthesis Using Dim and Dmoc as Protecting Groups, Journal of Organic Chemistry 2019, 10.1021/acs.joc.9b01527

#### Bio Sketch

I, Dhananjani (DJ) Eriyagama, am a 4<sup>th</sup> year graduate student working in Dr. Fang's research group in the department of Chemistry, where I specialized in nucleic acid chemistry and Polyethylene Glycol. I obtained my Bs. Degree in Chemistry from University of Peradeniya, Sri Lanka.

