

Synthetic studies of fluorogenic glycopolymers for intermolecular FRET (VI) ~Evaluation of interaction between lactose polymers and lectins~

(¹Graduate School of Science & Engineering, Saitama University, ²Advanced Institute of Innovative Technology, Saitama University, ³Strategic Research Center, Saitama University)

○Kota Miyairi¹, Takahiko Matsushita^{1,2,3}, Tetsuo Koyama¹, Ken Hatano^{1,2,3}, Koji Matsuoka^{1,2,3}

Keywords : Glycopolymer ; FRET ; Lectin ; Binding constant ; Lactose

Glycopolymers mimic a glycoprotein on cell surfaces and are expected to be applied to various biomaterials because they enhance the interaction with lectins through the sugar cluster effect¹⁾. In such applications, it is necessary to quantitatively evaluate the binding constant K_a to lectins in a simple and easy manner. However, existing methods are costly and time-consuming²⁾, so a simple method needs to be developed.

Therefore, we have been trying to develop a method to evaluate K_a using FRET technique. Our research plan is illustrated in Fig. 1 on the basis of intermolecular FRET. K_a is efficiently calculated from the fluorescence spectrum of the FRET. We have successfully calculated the K_a between two glycopolymers, GlcNAc polymer and WGA³⁾, and Mannose polymer and ConA, by using this novel method. In this study, to investigate the versatility of this new method, we expand the method using lactose as a sugar and RCA as a lectin in the same way. In this presentation, synthesis of Lactose-Dansyl polymers of various polymerization ratios and evaluation of FRET expression between the polymers and RCA by fluorescence measurement will be presented.

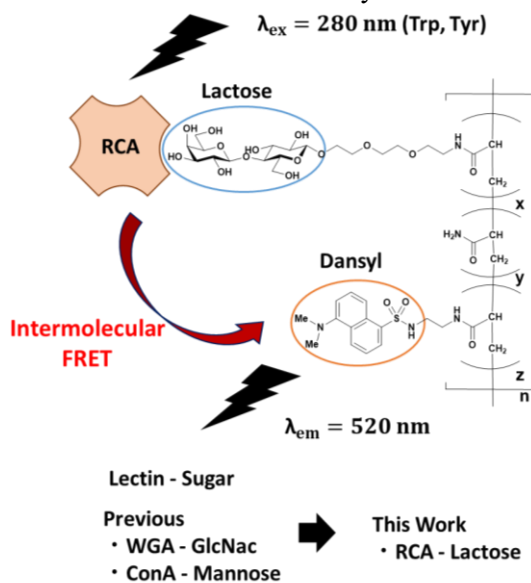


Fig.1 Intermolecular FRET

1) Spaltenstein, A., Whitesides, G.M., *J. Am. Chem. Soc.* **1991**, *113*, 686–687.

2) 大沢利昭 「レクチンと細胞生物学」 講談社 **1985**, 80-96.

3) Suzuki, Y. *et al.*, *Bioorg. Med. Chem. Lett.*, **2020**, *30*, 127024.