SAMPLE OF THE ABSTRACT

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Grant Title: In Vivo Patrolling and Therapeutic Molecules by Glycan Pattern Recognition

Abstract

Affinity of single molecule of glycan towards the corresponding lectin is weak. Therefore, they make glycoclusters on biotemplates, such as on exosomes or cells, to enhance the interactions to the targets (multivalency effects). On the other hands, they also use the various kinds of the glycan molecules to create the glycoclusters, so that the resulting clusters can also enhance the selectivity to the targets. We have called these characteristic glycan interaction as the "glycan pattern recognition", which could be important for the glycan-initiated biological responses. We have efficiently mimicked such "glycan pattern recognition" on albumin, by conjugating the several *N*-glycans by use of the RIKEN click reaction, and the selective cancer cell targeting has been achieved through both *in vitro* and *in vivo* experiments.[1-3]

If such glycocluster structure, hence, "glycan pattern recognition" could be transformed from one to another, the molecule could be trafficked. Therefore, we designed the glycocluster structures, a part of which could be transformed by the chemical stimuli. Such transformation was then performed *in vivo*, and we observed the molecular movement *in vivo* by molecular imaging.

We also successfully introduced the transition metal catalysts in the hydrophobic pocket of the albumin,[4] and the cancer-selective drug synthesis was achieved.[5] So that in future we could perform the tailor-made synthesis of the appropriate drugs at the targeted cancers.

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