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近接依存性標識法を用いた細胞への糖鎖高分子導入によるがん免疫療法の開発

（京工繊大院工芸 [1]・阪大院理 [2]）○河原 咲来 [1]・楢岡 善也 [1]・宮川 稜平 [2]・真鍋 良幸 [2]・深瀬 浩一 [2]・田中 知成 [1]

Development of Cancer Immunotherapy by Introducing Glycopolymers onto Cells Using Proximity Dependent Labeling ([1]*Graduate School of Science and Technology, Kyoto Institute of Technology,* [2]*Graduate School of Science, Osaka University*) ○Sakura Kawahara,[1] Zenya Naraoka,[1] Ryohei Miyagawa,[2] Yoshiyuki Manabe,[2] Koichi Fukase,[2] Tomonari Tanaka[1]

Glycans on the cell surface are known to serve as a marker to identify self and non-self. In humans, α-rhamnose (α-Rha) acts as a non-self and induces a severe immune response. To utilize this in cancer immunotherapy, it has been reported that introduction of carbohydrate antigens such as α-Rha on the surface of cancer cells recruits natural antibodies in the body and induces an immune response against cancer cells[1,2]. In this study, glycopolymers bearing α-Rha moieties were introduced onto the cancer cell surface using a proximity dependent labeling method based on antibodies and a radical reaction (Fig. 1). Furthermore, the immune response induced by the glycopolymers on the cancer cell surface was evaluated.

Keywords : Proximity Dependent Labeling; Glycopolymer; Antibody; Immunoreaction; Cancer cell

細胞表面に存在する糖鎖は、自己・非自己を識別する目印としての役割を果たすことが知られており、ヒトではα-ラムノース(α-Rha)が非自己として働き、激しい免疫反応を誘起する。これをがん免疫療法に利用するため、がん細胞表面にα-Rha などの糖鎖抗原を導入して体内の自然抗体をリクルートし、がん細胞に対する免疫反応の誘導が報告されている [1,2]。本研究では、抗体とラジカル反応を利用した近接依存性標識法を用いてがん細胞表面にα-Rha 担持糖鎖高分子を導入し、がん細胞表面に導入したα-Rha 担持糖鎖高分子による免疫応答を評価した(Fig. 1)。

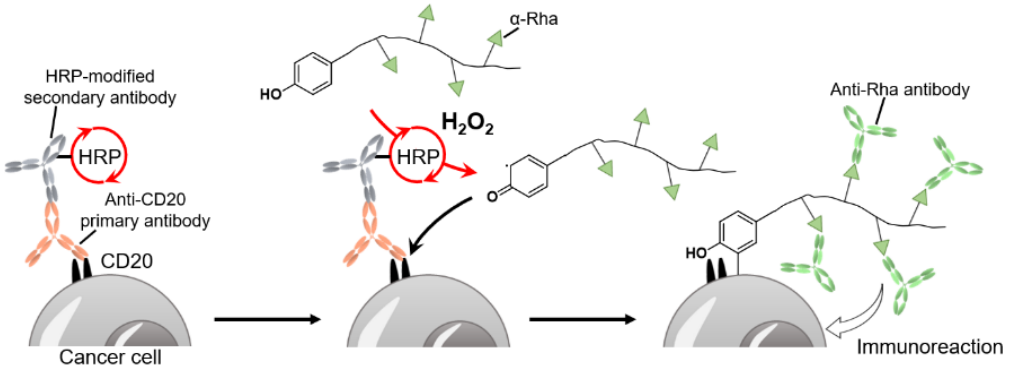

Fig. 1 Proximity labelling using glycopolymers.

1) J. Sianturi *et al.*, *Angew. Chem. Int. Ed.*, **2019**, *58*, 4526-4530.
2) R. D. Coen *et al.*, *Biomacromolecules*, **2020**, *21*, 793-802.