

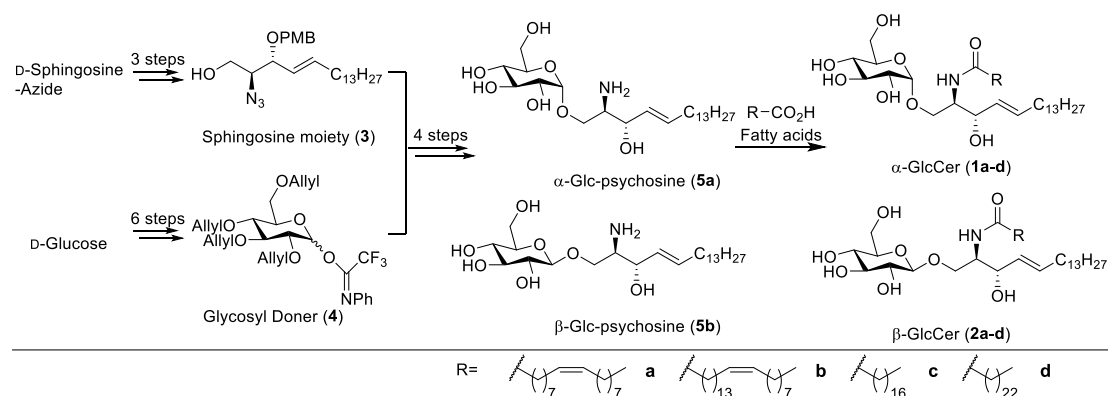
Glycosphingolipid GlcCer; developing synthetic methods and investigation of the biological activities

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Glucosylceramide (GlcCer), one of major glycosphingolipids, widely presents in living organism including plants, fungi and mammals.¹ In mammals, GlcCer usually possess C16-C24 lipids as *N*-acyl chain. The acyl chain distributions vary depending on the tissues or cell types.² However, there are only some examples of chemically synthesized natural GlcCer having diverse *N*-acyl chain. Therefore, we aimed to develop a synthetic strategy for introducing various fatty acids to GlcCer, and to build their compound library, for the analysis of the biological activities.

For the synthesis of GlcCer, we used allyl-type protecting group strategy³ to enable the divergent synthesis of GlcCers containing various lipids. We firstly synthesized sphingosine moiety **3** and glycosyl donor **4**, then constructed the glycolipid backbone by the glycosylation reaction of **3** and **4**. The key intermediates, Glc-psychosine **5a** and **5b**, were then prepared by cleavage of protecting groups including allyl groups and reduction of azido group. Subsequent selective amidation with various fatty acids gave GlcCer **1** and **2**, containing a variety of lipids including endogenous lipids. The evaluation of their biological activities will also be discussed.



Scheme 1. Synthetic route of GlcCer including various lipid

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