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Construction of C-Si Bonds in Carbohydrate Derivatives

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Silicon-containing compounds are becoming more popular in many areas of synthetic organic chemistry, biochemistry, materials, and everyday life. Many synthetic compounds that include different derivatives of silicon, such as silanes, siloxanes, and silan(di)ols, have a potential medicinal application.[1] In organic chemistry, various silicon-based protecting groups are used for synthetic transformations, especially in carbohydrate chemistry.[2] However, there are less reports on C-silylated carbohydrates.

Here, we present synthesis of carbohydrate-based silanes with different functionalizable moieties (Fig. 1). The synthesis is achieved starting from glucose with subsequent deoxygenation and functionalization to introduce the silyl groups.

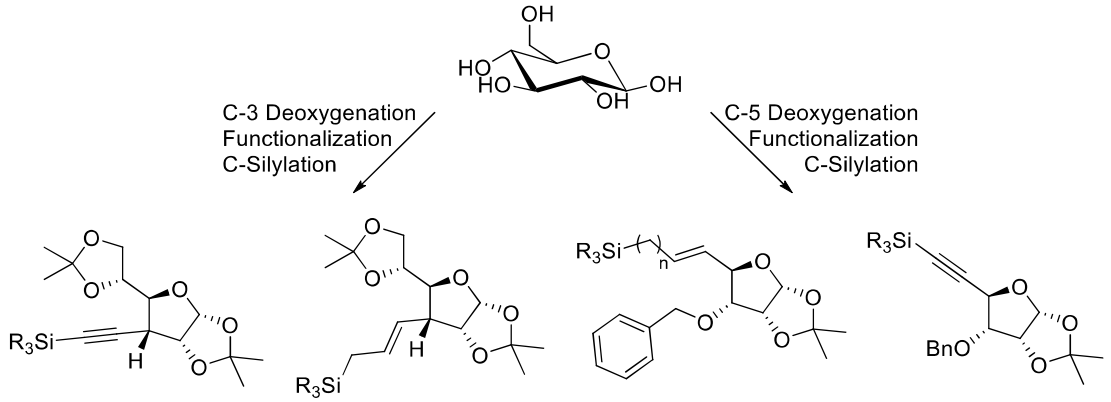

Figure 1: Carbohydrate-based functionalized silanes

The most effective ways of construction of C-Si bonds proved to be alkyne silylation and metathesis of alkene-containing carbohydrates and vinyl and allyl silanes. Depending on the substituents on the silicon, further functionalization is possible by reactions of silanes with nucleophiles or electrophiles, allowing interconnection of various carbohydrates.

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References:

1. Franz, A. K., Wilson, S. O. *J. Med. Chem.* **2013**, 56, 388.
2. Marcovic, D., Tchawou, W. A., Novosjolova, I., Laclef, S., Stepanovs, D., Turks, M., Vogel, P. *Chem. - Eur. J.*, **2016**, 22, 4196.