Synthesis of Simple Alkyl-Seleno-Carbohydrates

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INTRODUCTION

Selenium exists as trace element in mammalian and their metabolism is still in current investigation. Incorporate the selenium atom in carbohydrates is one way to further this investigations[1]. We planned this work since alkyl glycosides showed antimicrobial activity[2] and organoselenium serves as important therapeutic compounds, including anticancer agents[3]. Here, we present our work focused in the synthesis of alkyl-seleno linked in non-glycosidally form.

RESULTS AND DISCUSSION

First of all, the starting materials were synthesized. The alkyl-disselenides **1**, by Grignard reaction, using alkyl-bromides as reagents, and the tosylates **2** derivatives of *D*-xylose, *D*-ribose, *D*-galactose from respective protected sugars (figure 1).

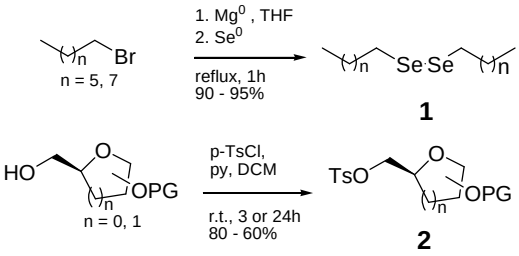


Figure 1. Synthesis of starting materials.

Then, the alkyl-seleno-neoglycoconjugates **3** were obtained by reductive cleavage of alkyl-disselenides **1** using $NaBH_4$ as reductant followed by addiction of tosylates **2**[4] (figure 2).

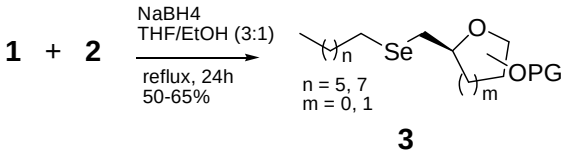
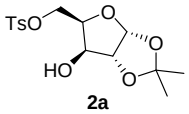
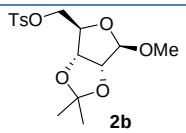
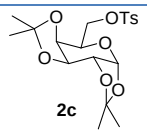


Figure 2. Synthesis of alkyl-selenium-glycoconjugates.

The choose for the specific chain of octyl and decyl for the present alkyl-seleno-neoglycoconjugates was based on previous works[5], which investigate the advantages of obtain *n*-octyl-β-*D*-glycosides to study biological activities. Futhermore, the improvement of this work is link the alkyl group in non-glycosidic position through a selenium atom by usual organic synthesis.

Table 1. Alkyl-selenium-neoglycoconjugates scope.

#	Alkyl	Tosylate	Time (h)	Yield (%)
1	Octyl	 **2a**	24	65
2	Decyl	**2a**	24	53
3	Octyl	 **2b**	24	66
4	Decyl	**2b**	24	60
5	Octyl	 **2c**	72*	51
6	Decyl	**2c**	72*	50

*Lower yields by 24h.

As we expected, the reaction carried out with octyl lead higher yields except for **2c**, which is more hindered, the yields are modest and the reaction takes more time, 72 instead of 24 hours.

CONCLUSION

Here, we presented a useful and simple way to obtain a new class of molecules, the alkyl-seleno-neoglycoconjugates. According to the previous works based on alkyl-glycosides, these molecules also showed potential biological activity and the anti-oxidant studies are in final adjustment course.

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