

# SYNTHETIC APPROACHES TO NOVEL THIOSUGAR SCAFFOLDS CONTAINING $\alpha,\beta$ -UNSATURATED CARBONYL FUNCTIONS

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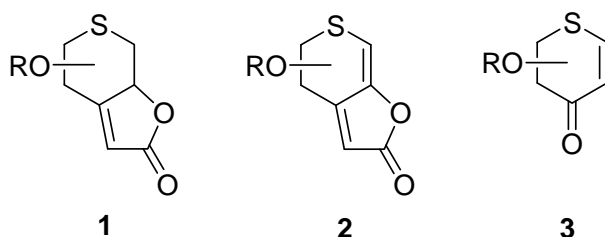
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Thiosugars which comprise a sulfur atom in the ring, possess interesting chemical and biological properties and have gained importance in glycobiology and in drug design, namely as glycosidase inhibitors or as potential anticancer and anti HIV agents.<sup>1,2</sup> Moreover sugar-derived unsaturated carbonyl compounds, such as lactones or ketones, possess inherent biological activity and are building blocks of high synthetic versatility, both owing to their electrophilic conjugated functionality.<sup>3</sup>

Linking thiosugar units to  $\alpha,\beta$ -unsaturated carbonyl systems may therefore provide potential bioactive compounds and also useful scaffolds for the synthesis of new thiosugar derivatives.

With the aforementioned motivations in mind and based on our previous approaches to sugar-derived butenolides,<sup>4,5</sup> we have turned our attention towards new thiosugar targets, namely those containing  $\alpha,\beta$ -unsaturated lactones (compounds type **1** and **2**) and ketones (compounds type **3**). For their synthesis, we employed furan-3-uloses as starting materials and we based our methodologies on intermolecular cyclization approaches, taking advantage of the ability of the free sugar ring to undergo furanose-pyranose interconversion.

In this communication we will present the synthetic routes and discuss our results for the preparation of these functionalized new thiosugars.



<sup>1</sup> Robina, I.; Vogel, P.; Witczak, Z. J. *Curr.Org. Chem.* **2001**, *5*, 1177–1214.

<sup>2</sup> Witczak, Z. J.; Culhane, J. M. *Appl. Microbiol. Biotechnol.* **2005**, *69*, 237–244.

<sup>3</sup> Xavier, N. M.; Rauter, A. P. *Carbohydr. Res.* **2008**, *343*, 1523–1539

<sup>4</sup> Xavier, N. M.; Rauter, A. P. *Org. Lett.* **2007**, *9*, 3339–3341.

<sup>5</sup> Xavier, N. M.; Silva, S.; Madeira, P. J. A.; Florêncio, M. H.; Silva, F. V. M.; Justino, J.; Thiem, J.; Rauter, A. P. *Eur. J. Org. Chem.* **2008**; in press