Ferrier/aza-Wacker/epoxidation/glycosylation sequence to access 1,2-trans-3-amino-3-deoxyglycosides

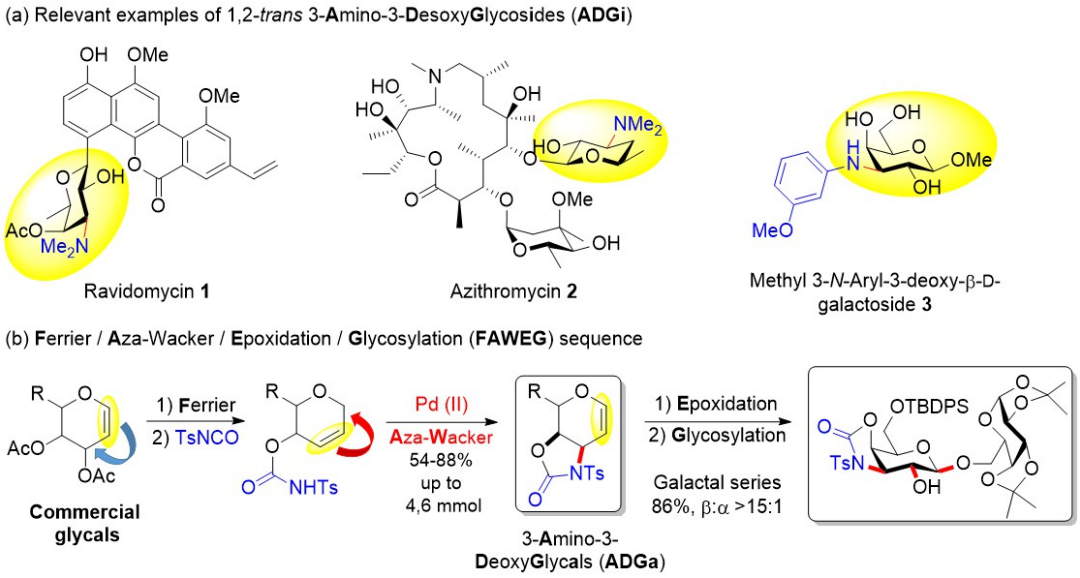
Antoine JOOSTEN [1], Anselme GEULIN [1], Yann BOURNE-BRANCHU [1], Kawther BEN-AYED [1], Thomas LECOURT [1]

[1] Normandie Univ, INSA Rouen, UNIROUEN, CNRS, COBRA UMR 6014 24 Rue Lucien Tesnière, 76130 Mont-Saint-Aignan France

antoine.joosten@insa-rouen.fr

3-**A**mino-3-**D**eoxy**G**lycos**i**des (**ADGi**) constitute an essential class of glycosides found both on bacterial natural products and on a large number of bioactive compounds.[1] Among these structures, many important ADGi possess a 1,2-*trans* glycosidic linkage. As noteworthy examples, ADGi can be found in the structures of anticancer agents (ravidomycin **1**) or macrolide antibiotics (azithromycin **2**). More recently, Nilsson et *al.* also showed that 3-*N*-Aryl-3-deoxy-β-D-galactosides such as **3** are selective inhibitors of galectin-9C (illustration, (a)).[2] Owing to their biological importance, the development of an expedient stereoselective approach to synthesize effective glycosyl donors of ADGi giving rise to 1,2-*trans* glycosidic linkage is therefore an essential matter for the discovery of new drugs, vaccines and new biosynthetic pathways.[3]

In this work, we describe a new sequence, involving a Ferrier rearrangement, and subsequent aza-Wacker cyclization, allowing the rapid synthesis of orthogonally protected 3-**A**mino-3-**D**eoxy**G**lyca**l**s (**ADGa**). In order to obtain 1,2-*trans* ADGi, we made a proof of concept to evaluate the ability of these *N*-tosyl protected ADGa to act as competent glycosyl donors precursors in an epoxidation / glycosylation sequence. 3-Amino-3-deoxygalactal derivative was submitted to an epoxidation / glycosylation with high yield and great diastereoselectivity, highlighting **FAWEG** (**F**errier/**A**za-**W**acker/ **E**poxidation/**G**lycosylation) as a new approach to access 1,2-*trans* 3-amino-3-deoxyglycosides (illustration, (b)).[4]



(a) Context of the study, (b) Our work.

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