Harnessing the reactivity of exo-glycals in iron-mediated hydrogen-atom transfer reactions

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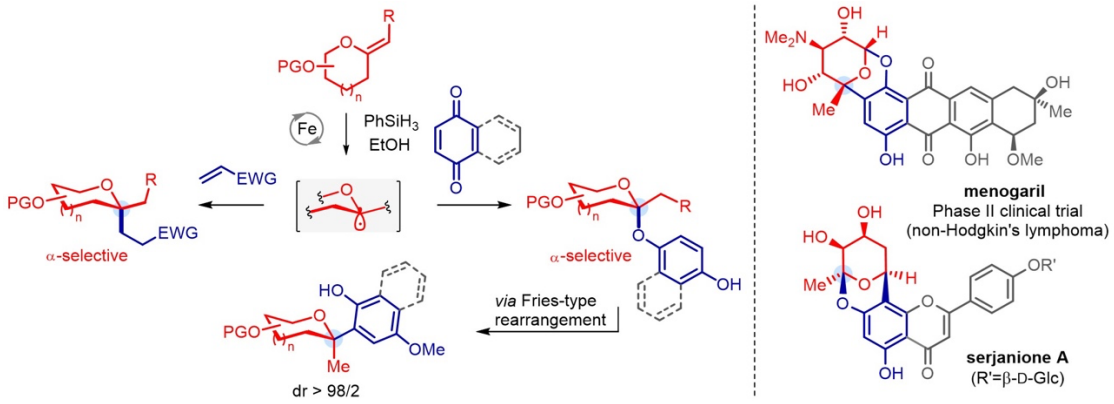
O- and *C*-aryl glycosides represent important classes of compounds of therapeutic interest [1]. Among them, serjanione A and menogaril, a clinically active antitumor drug derived from the natural product nogalamycin, are synthetically attractive [2]. In these unique structures, the sugar residue is joined to the aromatic moiety *via* both glycosidic and C-C bonds to form a benzoxocin ring system. In conjunction with our continuing studies on glycomimetics, we have recently reported a convenient strategy for the synthesis of *C*,*C*-glycosides from *exo*-glycals by way of Metal-hydride Hydrogen Atom Transfer (MHAT) [3]. The capture of the transient tertiary pseudoanomeric radicals by a range of Michael acceptors enables the stereocontrolled *C*-quaternization of the anomeric center. With the objective of developing a step-economical access to the benzoxocin core found in *C*,*O*-fused glycosyl (het)arenes such as serjanione A and nogalamycin, we envisioned the direct coupling of MHAT-generated glycosyl radicals with 1,4-quinones. This mild, one-step reaction which provides regiospecific access to phenolic *O*-ketosides may be viewed as a formal glycosylation of quinones, a transformation that has very few precedents [4].The synthesis of *C*-aryl ketosides *via*unprecedented Lewis acid-catalyzed *O*- to *C*- glycoside rearrangement was also demonstrated, opening the way to a unified strategy for the construction of *C*-glycoside motifs characterized by a stereodefined quaternary pseudoanomeric center bearing an exocyclic O- or C-aryl substituent.



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