

Supporting Information

Synthesis of substituted exo-glucals *via* a Julia modified olefination and identification as selective β -glucosidase inhibitors.

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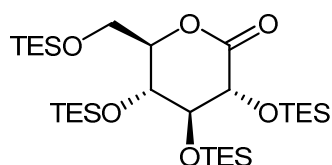
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General methods and materials

All reactions were carried out under an argon atmosphere. Solvents were distilled and dried by standard methods. Reactions were performed under argon atmosphere. NMR spectra were recorded at 293 K, unless stated otherwise, using a 300 MHz, a 400 MHz or a 500 MHz spectrometer. Shifts are referenced relative to deuterated solvent residual peaks. The following abbreviations are used to explain the observed multiplicities: s, singlet; d, doublet; dd, doublet of doublets; ddd, doublet of doublets of doublets; t, triplet; td, triplet of doublets; m, multiplet; bs, broad singlet. ¹³C NMR multiplicities are based on DEPT experiments. Low and high resolutions mass spectra were recorded using a Bruker MicrOTOF-Q II XL spectrometer. Thin-layer chromatography (TLC) was carried out on aluminium sheets coated with silica gel 60 F₂₅₄ (Merck). TLC plates were inspected by UV light (λ = 254 nm) and developed by treatment with a solution of 10% H₂SO₄ in EtOH/H₂O (1:1 v/v) followed by heating. Alumina gel column chromatography was performed with aluminium oxide basic Brockmann Activity 1 (50-200 μm). Silica gel column chromatography was performed with silica gel Si 60 (40–63 μm). Optical rotations were measured using a Perkin Elmer polarimeter and values are given in 10⁻¹ deg.cm².g⁻¹.

2,3,4,6-tetra-*O*-(triethylsilyl)-D-glucopyrano-1,5-lactone (**1**)



Chemical Formula: C₃₀H₆₆O₆Si₄
Exact Mass: 634,3936

To a solution of D-gluconolactone (1.5 g, 8.427 mmol, 1.0 eq.) in DMF at room temperature were added imidazole (4.6 g, 67.65 mmol, 8.0 eq.) and chlorotriethylsilane (6.9 mL, 40.46 mmol, 4.8 eq.). The mixture was stirred overnight, hydrolyzed with water, diluted with ethyl acetate and water, extracted with ethyl acetate. The combined organic layers were washed with water, brine, dried over anhydrous sodium sulphate, filtered and concentrated *in vacuo*, to afford the compound **1** as colorless oil. Yield (4.81 g, 7.587 mmol, 90%).

¹H NMR (300 MHz, CDCl₃) δ 4.56 (ddd, *J* = 7.6, 4.1, 2.5 Hz, 1H), 4.12 (dd, *J* = 3.8, 0.9 Hz, 1H), 4.00 (ddd, *J* = 7.7, 1.5, 0.9 Hz, 1H), 3.94 – 3.85 (m, 2H), 3.80 (dd, *J* = 11.8, 4.2 Hz, 1H), 0.99 – 0.92 (m, 36H), 0.69 – 0.55 (m, 25H).

¹³C NMR (75 MHz, CDCl₃) δ 170.2 (C^{IV}), 81.8 (CH), 77.6 (CH), 74.1 (CH), 71.4 (CH), 62.1 (CH₂), 7.1 (CH₃), 7.1 (CH₃), 7.1 (CH₃), 7.0 (CH₃), 6.9 (CH₃), 6.8 (CH₃), 5.3 (CH₂), 5.0 (CH₂), 4.8 (CH₂).

[α]_D²⁰: + 45.9° (c 1.03, CHCl₃)

HRMS (ESI⁺): 657.3807 [MNa⁺] – Calc: 657.3829

