INTRODUCTION

Carbohydrates constitute a large and diverse class of compounds present in varied materials and have major roles in applications in chemistry, biology, material science and related fields. In the context of biological systems, in particular, carbohydrate research has emerged as the “new frontier” for elucidating fundamental biochemical processes and for identifying new pharmaceutical substances.

Polyacetylene based sensor systems are unique because of blue to red color transitions due to their polymerized diacetylene unit. It is well known that the spatially aligned monomeric diacetylene moieties undergo photo polymerization process via a 1,4-addition mechanism and form conjugated chains that give the molecule a significant color change. Due to this unique color change, efforts have been devoted to develop efficient sensor systems based on the polyacetylenes. Our plan is devising PCDA (10,12-pentacosadynoic acid) biosensor, which is tagging carbohydrates with PCDA dye.

RESULTS AND DISCUSSION

Commercially available β-D-glucose pentacetate (1) was transformed into corresponding β-azide 2 by the known method. β-D-glucose pentacetate azide (2) was reduced with p-toluenesulfonic acid to get carbohydrate p-TSA ammonium salt 3 in good yield. The crude 10,12-pentacosadynoic acid chloride which was intum prepared from the PCDA and oxalyl chloride was react with compound 3 to get the glucose acetate derivative 4 with PCDA tail. The compound 4 has undergone deprotection reaction with methanol.

Scheme 1
and sodium methoxide to get the carbohydrate-PCDA amide 5 with 55% yield (Scheme 1).

Similarly, Galactose-PCDA amide 10 was synthesized by the deprotection of galactose pentaacetate-PCDA amide 9 with 45% yield (Scheme 2).

Herewith we have prepared precursors of dye labeled carbohydrate ligands which will be tested as a new biosensor. Further studies of biosensing living cell systems such as Concanavalin A or tumour cells are now on going and will be discussed soon.

**EXPERIMENT**

**General procedure for the preparation of β-D-glucose-PCDA amide 5 and β-D-galactose-PCDA amide 10.**

Compound (4 and 9) (each 0.07 mmol) was taken in a schlenk flask and added 1.6 mL of MeOH and 0.6 mL of NaOMe under nitrogen atmosphere. The reaction mixture was kept for stirring at room temperature. After 24 h, Amberlist IR-120 resin was added at the pH range 5 to 6. The resin was removed by aspiration and MeOH was evaporated under reduced pressure and dried. The crude compound was subjected to short column chromatography (Dichloromethane/Methanol 3:1) to get the products 5 and 10 respectively.

**Spectral data.**

**β-D-Glucose-PCDA amide 5:** Purple solid (yield 55%), m.p., 41 - 43 °C; IR (KBr) cm⁻¹: 3251, 2921, 2850, 1672, 1534, 1219, 1021; 1H NMR (400 MHz, CDCl₃) δ: 6.00 (d, J = 9.8 Hz, 1H), 4.09 (dd, J = 10.1, 9.6 Hz, 1H), 4.28 (t, J = 9.8 Hz, 1H), 4.11 (dd, J = 12.3, 4.1 Hz, 1H), 3.95 (dd, J = 12.4, 1.5 Hz, 1H), 3.50 (m, 1H), 2.17 (t, J = 7.2 Hz, 3H), 1.90-1.30 (m, 36H), 0.95 (t, J = 7.5 Hz, 3H). 13C NMR (100 MHz, CDCl₃) δ: 172.3, 78.2, 77.6, 77.3, 73.0, 62.4, 36.8, 32.4, 30.1, 29.9, 29.7, 29.1, 28.9, 28.8, 28.7, 28.7, 28.3, 28.3, 28.2, 28.1, 28.0, 28.0, 24.5, 19.8, 14.5.

**β-D-Galactose-PCDA amide 10:** Colorless oil (yield 45%); IR (KBr) cm⁻¹: 3263, 2925, 2835, 1700, 1533, 1277; 1H NMR (400 MHz, CDCl₃) δ: 6.37 (d, J = 9.5 Hz, 1H), 5.45 (d, J = 2.4 Hz, 1H), 5.28 (t, J = 9.2 Hz, 1H), 5.13 (m, 1H), 4.08 (m, 3H), 2.22 (t, J = 7.0 Hz, 3H), 2.16 (m, 3H), 2.06 (s, 3H), 2.05 (s, 3H), 2.00 (s, 3H), 1.7-1.2 (m, 36H), 0.89 (t, J = 7.0 Hz, 3H). 13C NMR (100 MHz, CDCl₃) δ: 172.8, 79.9, 77.7, 77.3, 73.4, 62.2, 37.1, 32.4, 30.1, 29.8, 29.7, 29.0, 28.8, 28.8, 2876, 284, 28.3, 28.2, 28.1, 28.0, 28.0, 24.4, 20.0, 14.9.

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**REFERENCES AND NOTES**


16. Concanavalin A is the first commercialized lectin protein. It reacts with specific terminal sugar residues and has been used as a useful tool in studying carbohydrates of cell surfaces.