SUPPORTING INFORMATION

Synthesis, characterization and gelation studies of a novel class of rhodamine based N-glycosylamines

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Experimental section

D-Glucose, rhodamine-B and rhodamine-6G were purchased from Sd-fine, India. 1,2-Diaminoethane and 1,3-diaminopropane were purchased from Sigma Aldrich chemicals Pvt. Ltd, USA and were of high purity. Paraldehyde, butyraldehyde, and benzaldehyde dimethyl acetal were purchased from SRL, India. Chloroform and methanol were used after distillation. Column chromatography was performed on silica gel (100-200 mesh). NMR spectra were recorded on a Bruker DRX 300 MHz, spectrometer. Elemental analysis was performed by using Perkin-Elmer 2400 series CHN analyser. The gels were imaged with a HITACHI-S-3400W Scanning Electron Microscope and optical rotation was performed using a Rudolph-Autopol II digital polarimeter. All absorption spectra were obtained with a UV-1600 UV/vis spectrometer (Shimadzu). All fluorescence spectra were obtained with an F4500 fluorescence spectrometer (Hitachi). Thermal transitions for gelators and gels were determined on a NETZSCH DSC 204 instrument. Rheological studies were recorded in Gemini 2000 using pp40. X-ray diffractograms of the dried films were recorded on XRD RINT 2500 diffractometer using Ni filtered Cu Ka radiation.

Preparation of gels

Rhodamine based N-glycosylamines 8-19 (1 mg) was placed in a glass vial and 1 ml of organic solvent was added. The gelator in the organic solvent was heated. The solution was then allowed to cool to room temperature whereby the gel formed.

General procedure for the synthesis of rhodamine based N-glycosylamines (8-19)

To a solution of rhodamine based amine derivatives (1-4) (1 mmol) in dry MeOH and 4,6-O-protected-D-glucopyranose (5-7) (1 mmol) were added. After stirring at reflux temperature for given period of time, the reaction mixture was evaporated under reduced pressure. The crude product was slurried with silica gel and purified by column chromatography. For details (reaction time and yields of products) see Table 1.

Physicochemical and spectral data for 4,6-O-ethyldiene-N-((rhodamine-B)-lactam)-ethyl-\(\beta\)-D-glucopyranosylamine (8)
Compound 8 was obtained by the reaction of rhodamine B based ethylenediamine (1, 1 mmol, 0.48 g), and 4,6-O-ethylidene-β-D-glucopyranose (5, 1 mmol, 0.20 g) as a pale pink solid. Yield: 0.48 g (71%); mp 172-174 °C; [α] D 23-31.4 (c 1.0 in CHCl3); 1H NMR (300 MHz, CDCl3+DMSO-d6): δ 1.67 (t, 12H, J = 6.9 Hz, -CH3), 1.35 (t, 3H, J = 4.8 Hz, -CH3), 3.25-3.34 (m, 4H, -CH2), 3.44-3.61 (m, 1H, Sac-H), 3.86 (d, 1H, J = 9.9 Hz, Ano-H), 4.02-4.11 (m, 2H, Sac-H), 4.36 (t, 2H, J = 3.3 Hz, Sac-H), 4.51-4.75 (m, 8H, -CH2), 4.76 (s, 2H, Sac-OH), 5.16 (s, 1H, -NH), 6.27 (d, 1H, J = 7.2 Hz, Ar-H), 6.30 (d, 1H, J = 7.2 Hz, Ar-H), 6.37 (d, 2H, J = 7.2 Hz, Ar-H), 6.44 (d, 2H, J = 8.7 Hz, Ar-H), 7.05 (q, 1H, J = 7.2 Hz, Ar-H), 7.43-7.46 (m, 2H, Ar-H), 7.86 (q, 1H, J = 5.7 Hz, Ar-H). 13C NMR (75 MHz, CDCl3+DMSO-d6): δ 17.3, 25.1, 48.3, 49.0, 65.6, 66.8, 70.1, 71.1, 73.0, 73.3, 75.4, 78.1, 80.8, 85.1, 85.7, 97.8, 102.3, 102.5, 104.1, 109.6, 112.8, 127.3, 128.5, 132.8, 133.1, 135.2, 137.3, 153.5, 157.9, 158.5, 173.9 (C=O). Anal. Calcd for C38H48N4O7: C, 67.84; H, 7.19; N, 8.33. Found: C, 67.87; H, 7.16; N, 8.37.

Physicochemical and spectral data for 4,6-O-butylidene-β-D-glucopyranosylamine (9)

Compound 9 was obtained by the reaction of rhodamine B based ethylenediamine (1, 1 mmol, 0.48 g), and 4,6-O-butylidene-β-D-glucopyranose (6, 1 mmol, 0.23 g) as a pale pink solid. Yield: 0.46 g (65%); mp 166-168 °C; [α] D 23-48.2 (c 1.0 in CHCl3); 1H NMR (300 MHz, CDCl3+DMSO-d6): δ 0.89 (t, 3H, J = 7.2 Hz, -CH3), 1.15 (t, 12H, J = 6.9 Hz, -CH3), 1.37-1.45 (m, 2H, -CH2), 1.58-1.61 (m, 2H, -CH2), 3.22 (q, 5H, J = 5.2 Hz, Sac-H), 3.30-3.37 (m, 8H, -CH2), 3.41-3.81 (m, 2H, Sac-H), 4.00-4.05 (m, 4H, -CH2), 4.38 (s, 2H, Sac-OH), 4.53 (d, 1H, J = 7.2 Hz, Ano-H), 5.11 (s, 1H, -NH), 6.27 (dd, 2H, J = 8.7 Hz, Ar-H), 6.35 (d, 2H, J = 7.1 Hz, Ar-H), 6.41 (d, 2H, J = 9.0 Hz, Ar-H), 7.03 (q, 1H, J = 6.9 Hz, Ar-H), 7.44 (q, 2H, J = 7.2 Hz, Ar-H), 7.83 (q, 1H, J = 7.2 Hz, Ar-H). 13C NMR (75 MHz, CDCl3+DMSO-d6): δ 17.2, 22.1, 25.2, 41.0, 48.0, 49.0, 65.2, 67.0, 69.9, 71.3, 73.4, 75.4, 78.2, 85.9, 97.9, 102.5, 106.9, 109.7, 112.8,

Physicochemical and spectral data for 4,6-O-benzylidene-N-((rhodamine-B)-lactam)-ethyl)-β-D-glucopyranosylamine (10)

Compound 10 was obtained by the reaction of rhodamine B based ethylenediamine (1, 1 mmol, 0.48 g), and 4,6-O-benzylidene-β-D-glucopyranose (7, 1 mmol, 0.26 g) as a pale pink solid. Yield: 0.51 g (69%); mp 179-181 °C; [α]D 23 – 76.8 (c 1.0 in CHCl₃); ¹H NMR (300 MHz, CDCl₃+DMSO-d₆): δ 1.15 (t, 12H, J = 6.9 Hz, -CH₃), 3.09 (d, 2H, J = 4.2 Hz, Sac-H), 3.25-3.41 (m, 8H, -CH₂), 3.44-3.78 (m, 5H, Sac-H), 3.91 (d, 1H, J = 9.3 Hz, Ano-H), 3.98-4.07 (m, 1H, Sac-H), 4.18-4.36 (m, 3H, Sac-H), 4.85 (s, 1H, Sac-OH), 5.19 (s, 1H, Sac-OH), 5.51 (s, 1H, -NH), 6.27 (dd, 2H, J = 9.0 Hz, Ar-H), 6.36 (d, 2H, J = 7.2 Hz, Ar-H), 6.43 (d, 2H, J = 8.7 Hz, Ar-H), 7.04 (q, 2H, J = 7.2 Hz, Ar-H), 7.32 (t, 3H, J = 7.8 Hz, Ar-H), 7.43-7.49 (m, 3H, Ar-H), 7.84 (q, 1H, J = 6.9 Hz, Ar-H). ¹³C NMR (75 MHz, CDCl₃+DMSO-d₆): δ 17.3, 48.3, 49.0, 65.6, 66.9, 70.1, 71.1, 73.5, 73.9, 75.3, 78.1, 80.8, 85.8, 86.4, 97.9, 102.4, 102.5, 106.4, 109.6, 112.8, 127.3, 128.5, 131.2, 132.8, 133.1, 133.7, 135.2, 137.3, 153.5, 157.9, 158.5, 173.8 (C=O). HRMS (ES+): m/z Calcd for for C₄₃H₅₀N₄O₇: 734.3767. Found: 734.3754 (M+H)^+; elemental analysis: anal. calcd for C₄₃H₅₀N₄O₇: C, 70.28; H, 6.86; N, 7.62. Found: C, 70.25; H, 6.84; N, 7.64.

Physicochemical and spectral data for 4,6-O-ethylidene-N-((rhodamine-6G)-lactam)-ethyl)-β-D-glucopyranosylamine (11)
Compound 11 was obtained by the reaction of rhodamine 6G based ethylenediamine (2, 1 mmol, 0.45 g), and 4,6-O-ethylidene-β-D-glucopyranose (5, 1 mmol, 0.20 g) as a pale pink solid. Yield: 0.41 g (64%); mp 168-170 °C; [α]_D^23 – 87.5 (c 1.0 in CHCl_3); ^1H NMR (300 MHz, CDCl_3+DMSO-d_6): δ 1.35 (t, 9H, J = 5.4 Hz, -CH_3), 1.92 (s, 6H, -CH_3), 3.23 (m, 4H, -CH_2), 3.48 (t, 3H, J = 10.2 Hz, Sac-H), 3.62 (s, 2H, Sac-OH), 3.79-3.88 (m, 4H, -CH_2), 3.98-4.06 (m, 3H, 3H, Sac-H), 4.43 (s, 2H, -NH), 4.60 (q, 1H, J = 6.2 Hz, Sac-H), 4.72 (d, 1H, J = 9.9 Hz, Ano-H), 5.16 (t, 1H, J = 3.6 Hz, Sac-H), 6.18 (d, 2H, J = 7.8 Hz, Ar-H), 6.36 (s, 2H, Ar-H), 7.03 (q, 1H, J = 7.4 Hz, Ar-H), 7.46 (q, 2H, J = 8.0 Hz, Ar-H), 7.91 (q, 1H, J = 6.9 Hz, Ar-H). ^13C NMR (75 MHz, CDCl_3+DMSO-d_6): δ 17.9, 22.6, 25.2, 42.9, 66.8, 70.7, 71.1, 72.9, 73.3, 75.3, 78.1, 80.8, 85.1, 85.8, 97.9, 101.4, 102.3, 104.0, 109.4, 122.8, 127.5, 128.4, 132.1, 132.9, 134.4, 137.3, 152.3, 156.5, 156.8, 170.7 (C=O). HRMS (ES+): m/z Calcd for C_{36}H_{44}N_4O_7: 644.3263. Found: 644.3254 (M+H)^+; elemental analysis: anal. calcd for C_{36}H_{44}N_4O_7: C, 67.06; H, 6.88; N, 8.69. Found: C, 67.08; H, 6.86; N, 8.66.

Physicochemical and spectral data for 4,6-O-butylidene-N-(((rhodamine-6G)-lactam)-ethyl)-β-D-glucopyranosylamine (12)

Compound 12 was obtained by the reaction of rhodamine 6G based ethylenediamine (2, 1 mmol, 0.45 g), and 4,6-O-butylidene-β-D-glucopyranose (6, 1 mmol, 0.23 g) as a pale pink solid. Yield: 0.38 g (57%); mp 161-163 °C; [α]_D^23 – 60.4 (c 1.0 in CHCl_3); ^1H NMR (300 MHz, CDCl_3+DMSO-d_6): δ 0.85 (t, 3H, J = 7.2 Hz, -CH_3), 1.27 (t, 6H, J = 6.9 Hz, -CH_3), 1.34-1.41 (m, 2H, -CH_2), 1.55-1.58 (m, 2H, -CH_2), 1.87 (s, 6H, -CH_3), 3.13-3.17 (m, 4H, -CH_2), 3.41 (t, 2H, J = 6.2 Hz, Sac-H), 3.58 (s, 2H, Sac-OH), 3.78 (s, 4H, -CH_2), 3.93-4.02 (m, 3H, Sac-H), 4.35 (s, 2H, -NH), 4.49 (t, 3H, J = 4.8 Hz, Sac-H), 5.09 (d, 1H, J = 7.3 Hz, Ano-H), 6.15 (d, 2H, J = 7.2 Hz, Ar-H), 6.31 (s, 2H, Ar-H), 6.98 (q, 1H, J = 6.9 Hz, Ar-H), 7.41 (q, 2H, J = 7.8 Hz,
Ar-H), 7.85 (q, 1H, J = 7.8 Hz, Ar-H). $^1$C NMR (75 MHz, CDCl$_3$+DMSO-d$_6$): δ 18.7, 19.4, 21.6, 22.1, 41.0, 42.9, 67.0, 70.7, 73.4, 75.5, 78.2, 85.8, 97.8, 101.4, 106.9, 122.7, 128.4, 132.1, 132.8, 134.4, 137.3, 152.3, 156.5, 156.8, 170.7 (C=O). HRMS (ES+): m/z Calcd for C$_{38}$H$_{48}$N$_4$O$_7$: 672.3553. Found: 672.3542 (M+H$^+$); elemental analysis: anal. calcd for C$_{38}$H$_{48}$N$_4$O$_7$: C, 67.84; H, 7.19; N, 8.33. Found: C, 67.87; H, 7.16; N, 8.36.

**Physicochemical and spectral data for 4,6-O-benzylidene-N-(((rhodamine-6G)-lactam)-ethyl)-β-D-glucopyranosylamine (13)**

Compound 13 was obtained by the reaction of rhodamine 6G based ethylenediamine (2, 1 mmol, 0.45 g), and 4,6-O-benzylidene-β-D-glucopyranose (7, 1 mmol, 0.26 g) as a pale pink solid. Yield: 0.42 g (60%); mp 146-148 °C; $[\alpha]_D^{23}$ - 75.2 (c 1.0 in CHCl$_3$); $^1$H NMR (300 MHz, CDCl$_3$+DMSO-d$_6$): δ 1.29 (t, 6H, J = 6.9 Hz, -CH$_3$), 1.89 (s, 6H, -CH$_3$), 3.15-3.29 (m, 4H, -CH$_2$), 3.38-3.50 (m, 3H, Sac-H), 3.61-3.75 (m, 3H, Sac-H), 3.87 (d, 1H, J = 9.0 Hz, Ano-H), 3.95-4.03 (m, 1H, Sac-H), 4.15-4.26 (m, 1H, Sac-H), 4.58-4.68 (m, 4H, -CH$_2$), 4.82 (s, 1H, Sac-OH), 5.15 (s, 1H, Sac-OH), 5.49 (s, 2H, -NH), 6.18 (s, 2H, Ar-H), 6.33 (s, 2H, Ar-H), 6.99 (q, 1H, J = 6.7 Hz, Ar-H), 7.30 (t, 3H, J = 8.2 Hz, Ar-H), 7.42-7.48 (m, 4H, Ar-H), 7.86 (q, 1H, J = 7.2 Hz, Ar-H). $^{13}$C NMR (75 MHz, CDCl$_3$+DMSO-d$_6$): δ 19.4, 21.6, 42.9, 66.9, 70.7, 71.8, 75.3, 78.1, 80.8, 85.8, 86.5, 98.0, 101.4, 102.5, 106.3, 106.4, 109.5, 122.7, 128.4, 131.2, 131.3, 132.1, 132.8, 133.7, 134.5, 137.2, 152.3, 156.5, 156.8, 170.7 (C=O). Anal. Calcd for C$_{41}$H$_{46}$N$_4$O$_7$: C, 69.67; H, 6.56; N, 7.93. Found: C, 69.65; H, 6.58; N, 7.95.

**Physicochemical and spectral data for 4,6-O-ethylidene-N-(((rhodamine-B)-lactam)-propyl)-β-D-glucopyranosylamine (14)**
Compound 14 was obtained by the reaction of rhodamine B based 1,3-propylenediamine (3, 1 mmol, 0.49 g), and 4,6-<i>O</i>-ethylidine-<i>β</i>-D-glucopyranose (5, 1 mmol, 0.20 g) as a pale pink solid. Yield: 0.42 g (62%); mp 150-152 °C; [α]<sub>D</sub> - 72.6 (c 1.0 in CHCl<sub>3</sub>); <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>+DMSO-d<sub>6</sub>): δ 1.16 (t, 12H, <i>J</i> = 6.9 Hz, -CH<sub>3</sub>), 1.34 (t, 3H, <i>J</i> = 4.2 Hz, -CH<sub>3</sub>), 3.31-3.37 (m, 8H, -CH<sub>2</sub>), 3.49 (d, 2H, <i>J</i> = 9.9 Hz, Sac-H), 3.62 (d, 1H, <i>J</i> = 6.6 Hz, Sac-H), 3.78-3.88 (m, 2H, Sac-H), 4.02-4.09 (m, 2H, Sac-H), 4.52 (s, 2H, Sac-OH), 4.60 (d, 1H, <i>J</i> = 7.5 Hz, Ano-H), 4.70-4.73 (m, 6H, -CH<sub>2</sub>), 5.17 (s, 1H, -NH), 6.26 (q, 2H, <i>J</i> = 6.9 Hz, Ar-H), 6.37 (q, 4H, <i>J</i> = 7.2 Hz, Ar-H), 7.05-7.10 (m, 1H, Ar-H), 7.45 (q, 2H, <i>J</i> = 9.6 Hz, Ar-H), 7.86 (q, 1H, <i>J</i> = 7.2 Hz, Ar-H). <sup>13</sup>C NMR (75 MHz, CDCl<sub>3</sub>+DMSO-d<sub>6</sub>): δ 12.4, 20.2, 28.5, 37.3, 44.1, 62.0, 66.2, 67.2, 68.1, 68.5, 70.5, 73.1, 74.6, 75.9, 80.1, 80.3, 80.7, 91.1, 92.9, 97.3, 97.5, 99.2, 107.9, 122.4, 123.6, 127.9, 128.5, 132.2, 148.6, 153.1, 168.1 (C=O). Anal. Calcd for C<sub>39</sub>H<sub>50</sub>N<sub>4</sub>O<sub>7</sub>: C, 68.20; H, 7.34; N, 8.16. Found: C, 68.23; H, 7.37; N, 8.13.

Physicochemical and spectral data for 4,6-<i>O</i>-butylidine-<i>N</i>-((rhodamine-B)-lactam)-propyl-<i>β</i>-D-glucopyranosylamine (15)

Compound 15 was obtained by the reaction of rhodamine B based 1,3-propylenediamine (3, 1 mmol, 0.49 g), and 4,6-<i>O</i>-butylidine-<i>β</i>-D-glucopyranose (6, 1 mmol, 0.23 g) as a pale pink solid. Yield: 0.44 g (62%); mp 144-147 °C; [α]<sub>D</sub> - 77.5 (c 1.0 in CHCl<sub>3</sub>); <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>+DMSO-d<sub>6</sub>): δ 0.87 (t, 3H, <i>J</i> = 7.5 Hz, -CH<sub>3</sub>), 1.13 (t, 12H, <i>J</i> = 6.9 Hz, -CH<sub>3</sub>), 1.34-1.42 (m, 2H, -CH<sub>2</sub>), 1.54-1.60 (m, 2H, -CH<sub>2</sub>), 3.11-3.13 (m, 4H, Sac-H), 3.14 (s, 2H, Sac-OH), 3.16-3.18 (m, 2H, Sac-H), 3.56 (d, 1H, <i>J</i> = 8.1 Hz, Ano-H), 3.73-4.10 (m, 8H, -CH<sub>2</sub>), 4.49-4.56 (m, 6H, -CH<sub>2</sub>), 5.05 (s, 1H, -NH), 5.12 (d, 1H, <i>J</i> = 3.6 Hz, Sac-H), 6.23 (q, 2H, <i>J</i> = 9.0 Hz, Ar-H), 6.34 (q, 4H, <i>J</i> = 7.2 Hz, Ar-H), 7.02 (q, 1H, <i>J</i> = 6.9 Hz, Ar-H), 7.42 (t, 2H, <i>J</i> = 7.2 Hz, Ar-H), 7.82 (q, 1H, <i>J</i> = 7.5 Hz, Ar-H). <sup>13</sup>C NMR (75 MHz, CDCl<sub>3</sub>+DMSO-d<sub>6</sub>): δ 17.3, 18.7, 22.1, 40.9, 41.0, 49.0, 67.0, 71.2, 73.0, 73.4, 75.3, 78.0, 80.7, 85.1, 85.7, 96.0, 97.8, 102.2, 102.4, 106.9,
Physicochemical and spectral data for 4,6-\(\text{O}\)-benzyldiene-\(\text{N}\)-((rhodamine-B)-lactam)-propyl)-\(\beta\)-D-glucopyranosylamine (16)

Compound 16 was obtained by the reaction of rhodamine B based 1,3-propylenediamine (3, 1 mmol, 0.49 g), and 4,6-\(\text{O}\)-benzyldiene-\(\beta\)-D-glucopyranose (7, 1 mmol, 0.26 g) as a pale pink solid. Yield: 0.52 g (70%); mp 162-164 °C; \([\alpha]_\text{D}^{23}\) - 97.4 (c 1.0 in CHCl₃); \(^1\)H NMR (300 MHz, CDCl₃+DMSO-d₆): \(\delta\) 1.15 (t, 12H, \(J = 6.9\) Hz, -CH₃), 3.11-3.18 (m, 4H, Sac-H), 3.29-3.34 (m, 8H, -CH₂), 3.43 (t, 1H, \(J = 9.3\) Hz, Sac-H), 3.59-3.71 (m, 6H, -CH₂), 3.84 (d, 1H, \(J = 8.4\) Hz, Sac-H), 4.19 (q, 1H, \(J = 7.2\) Hz, Sac-H), 4.68 (s, 2H, Sac-OH), 5.26 (s, 1H, -NH), 5.49 (d, 1H, \(J = 8.7\) Hz, Ano-H), 6.25 (q, 2H, \(J = 8.7\) Hz, Ar-H), 6.33-6.39 (m, 4H, Ar-H), 7.05 (q, 1H, \(J = 7.8\) Hz, Ar-H), 7.31 (t, 3H, \(J = 8.8\) Hz, Ar-H), 7.41-7.48 (m, 4H, Ar-H), 7.85 (q, 1H, \(J = 8.2\) Hz, Ar-H). \(^{13}\)C NMR (75 MHz, CDCl₃+DMSO-d₆): \(\delta\) 17.3, 33.5, 42.2, 49.0, 69.8, 72.1, 73.6, 78.6, 79.4, 85.9, 96.1, 102.4, 106.3, 110.3, 112.7, 127.3, 128.4, 131.1, 132.8, 133.4, 133.6, 135.9, 137.1, 142.2, 153.5, 158.0, 158.2, 172.8 (C=O). Anal. Calcd for C_{44}H_{52}N_{17}O_{7}: C, 70.57; H, 7.00; N, 7.48. Found: C, 70.59; H, 7.03; N, 7.45.

Physicochemical and spectral data for 4,6-\(\text{O}\)-ethylidine-\(\text{N}\)-((rhodamine-6G)-lactam)-propyl)-\(\beta\)-D-glucopyranosylamine (17)
Compound 17 was obtained by the reaction of rhodamine 6G based 1,3-propylenediamine (4, 1 mmol, 0.47 g), and 4,6-O-ethyldiene-β-D-glucopyranose (5, 1 mmol, 0.20 g) as a pale pink solid. Yield: 0.48 g (74%); mp 142-144 °C; [α] D 23 - 32.2 (c 1.0 in CHCl₃); ¹H NMR (300 MHz, CDCl₃+DMSO-d₆): δ 1.13 (t, 9H, J = 6.9 Hz, -CH₃), 1.90 (s, 6H, -CH₃), 3.15-3.25 (m, 6H, -CH₂), 3.31 (d, 1H, J = 8.4 Hz, Sac-H), 3.42-3.54 (m, 2H, Sac-H), 3.65 (q, 3H, J = 6.7 Hz, Sac-H), 3.75 (d, 1H, J = 8.4 Hz, Sac-H), 3.84-3.90 (m, 2H, Sac-H), 4.02 (s, 2H, Sac-OH), 4.60 (d, 1H, J = 7.8 Hz, Ano-H), 4.69-4.75 (m, 4H, -CH₂), 5.17 (s, 1H, -NH), 6.16 (d, 2H, J = 7.2 Hz, Ar-H), 6.33 (s, 2H, Ar-H), 7.03 (t, 1H, J = 7.2 Hz, Ar-H), 7.46 (q, 2H, J = 7.8 Hz, Ar-H), 7.85 (q, 1H, J = 7.8 Hz, Ar-H). ¹³C NMR (75 MHz, CDCl₃+DMSO-d₆): δ 17.8, 19.8, 20.0, 23.5, 23.6, 23.8, 41.5, 65.4, 68.4, 69.6, 71.5, 71.7, 71.9, 73.9, 76.5, 76.6, 81.3, 83.5, 84.2, 96.3, 99.7, 100.7, 102.6, 104.5, 105.9, 108.9, 112.1, 125.8, 126.9, 131.4, 131.5, 135.6, 150.7, 154.9, 171.2 (C=O). Anal. Calcd for C₃₇H₄₆N₄O₇: C, 67.46; H, 7.04; N, 8.50. Found: C, 67.49; H, 7.07; N, 8.52.

Physicochemical and spectral data for 4,6-O-butylidine-N-(((rhodamine-6G)-lactam)-propyl)-β-D-glucopyranosylamine (18)

Compound 18 was obtained by the reaction of rhodamine 6G based 1,3-propylenediamine (4, 1 mmol, 0.47 g), and 4,6-O-butylidine-β-D-glucopyranose (6, 1 mmol, 0.23 g) as a pale pink solid. Yield: 0.53 g (64%); mp 156-159 °C; [α] D 23 - 67.6 (c 1.0 in CHCl₃); ¹H NMR (300 MHz, CDCl₃+DMSO-d₆): δ 0.88 (t, 6H, J = 7.2 Hz, -CH₃), 1.29 (t, 3H, J = 6.6 Hz, -CH₃), 1.36-1.43 (m, 2H, -CH₂), 1.57-1.61 (m, 2H, -CH₂), 1.88 (s, 6H, -CH₃), 3.42-3.54 (m, 6H, -CH₂), 3.75-3.85 (m, 4H, Sac-H), 3.91 (s, 2H, Sac-OH), 3.98-4.05 (m, 5H, Sac-H), 4.07 (d, 1H, J = 7.5 Hz, Ano-H), 4.50-4.52 (m, 4H, -CH₂), 5.10 (s, 1H, -NH), 6.12 (s, 2H, Ar-H), 6.29 (s, 2H, Ar-H), 6.99 (s, 1H, Ar-H), 7.45 (s, 2H, Ar-H), 7.84 (s, 1H, Ar-H). ¹³C NMR (75 MHz, CDCl₃+DMSO-d₆): δ 21.6, 25.2, 25.3, 42.9, 66.8, 71.1, 72.9, 73.3, 75.2, 78.1, 80.8, 85.2, 85.8, 97.9, 101.4, 102.4, 103.4, 104.0, 110.4, 122.9, 127.2, 128.5, 132.9, 137.2, 152.3, 156.4, 172.6 (C=O). Anal. Calcd
for C$_{39}$H$_{50}$N$_4$O$_7$: C, 68.20; H, 7.34; N, 8.16. Found: C, 68.22; H, 7.37; N, 8.18.

**Physicochemical and spectral data for 4,6-O-benzylidene-N-(((rhodamine-6G)-lactam)-propyl)-β-D-glucopyranosylamine (19)**

![Chemical structure of compound 19](image)

Compound 19 was obtained by the reaction of rhodamine 6G based 1,3-propylenediamine (4, 1 mmol, 0.47 g), and 4,6-O-benzylidene-β-D-glucopyranose (7, 1 mmol, 0.26 g) as a pale pink solid. Yield: 0.44 g (61%); mp 172-174 °C; [$\alpha$]$_D^{23}$ - 87.4 (c 1.0 in CHCl$_3$); $^1$H NMR (300 MHz, CDCl$_3$+DMSO-d$_6$): $\delta$ 1.33 (t, 6H, $J$ = 6.9 Hz, -CH$_3$), 1.92 (s, 6H, -CH$_3$), 3.20-3.48 (m, 6H, -CH$_2$), 3.50-3.58 (m, 4H, Sac-H), 3.66-3.78 (m, 4H, -CH$_2$), 3.81-4.33 (m, 3H, Sac-H), 4.67 (d, 1H, $J$ = 7.8 Hz, Ano-H), 5.23 (d, 2H, $J$ = 3.6 Hz, Sac-H), 5.51 (s, 2H, Sac-OH), 5.23 (s, 1H, -NH), 6.19 (d, 2H, $J$ = 7.2 Hz, Ar-H), 6.36 (s, 2H, Ar-H), 7.05 (d, 1H, $J$ = 7.4 Hz, Ar-H), 7.35 (t, 4H, $J$ = 7.2 Hz, Ar-H), 7.48-7.51 (m, 3H, Ar-H), 7.91 (q, 1H, $J$ = 7.0 Hz, Ar-H). $^{13}$C NMR (75 MHz, CDCl$_3$+DMSO-d$_6$): $\delta$ 19.3, 21.2, 21.5, 43.0, 66.9, 71.1, 73.5, 73.9, 75.4, 78.0, 80.7, 81.9, 85.7, 86.3, 97.9, 101.2, 102.3, 106.4, 122.7, 128.4, 130.8, 130.9, 131.1, 131.2, 131.3, 132.8, 133.0, 133.7, 142.2, 142.3, 142.6, 152.3, 156.3, 172.8 (C=O). Anal. Calcd for C$_{42}$H$_{48}$N$_4$O$_7$: C, 69.98; H, 6.71; N, 7.77. Found: C, 69.95; H, 6.71; N, 7.75.
Absorption spectra of potential gelators and xerogels

![Absorption Spectra Graph]

Emission spectra of potential gelators and xerogels

![Emission Spectra Graph]
S1. $^1$H NMR spectrum of compound 8
S2. $^{13}$C NMR spectrum of compound 8
S3. $^1$H NMR spectrum of compound 9
S4. $^{13}$C NMR spectrum of compound 9
S5. $^1$H NMR spectrum of compound 10
S6. $^{13}$C NMR spectrum of compound 10
S7. $^1$H NMR spectrum of compound 11
S8. $^{13}$C NMR spectrum of compound 11
S9. $^1$H NMR spectrum of compound 12
S10. $^{13}$C NMR spectrum of compound 12
S11. $^1$H NMR spectrum of compound 13
S12. $^{13}$C NMR spectrum of compound 13
S13. $^1$H NMR spectrum of compound 14
S14. $^{13}$C NMR spectrum of compound 14
S15. $^1$H NMR spectrum of compound 15
S16. $^{13}$C NMR spectrum of compound 15

![C NMR spectrum of compound 15]
S17. $^1$H NMR spectrum of compound 16
S18. $^{13}$C NMR spectrum of compound 16
S19. $^1$H NMR spectrum of compound 17
S20. $^{13}$C NMR spectrum of compound 17
S21. $^1$H NMR spectrum of compound 18
S22. $^{13}$C NMR spectrum of compound 18
S23. $^1$H NMR spectrum of compound 19
S24. $^{13}$C NMR spectrum of compound 19
Mass spectrum of compound 9

**Single Mass Analysis (displaying only valid results)**

- Tolerance = 200.0 mDa
- DBE: min = -1.5, max = 50.0
- Isotope cluster parameters: Separation = 1.0, Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
12 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

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Mass spectrum of compound 10
Mass spectrum of compound 11

**Elemental Composition Report**

**Single Mass Analysis (displaying only valid results)**
- Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
- Isotope cluster parameters: Separation = 1.0, Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
12 formula(e) evaluated with 1 results within limits (all results up to 1000) for each mass

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Mass spectrum of compound 12

**Single Mass Analysis (displaying only valid results)**
Tolerance = 200.0 mDa  /  DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
12 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

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$^1$H NMR spectrum of compound 12
$^{13}$C NMR spectrum of compound 12
$^1$H NMR spectrum of compound 11
$^{13}$C NMR spectrum of compound 11
$^1$H NMR spectrum of compound 9
$^{13}$C NMR spectrum of compound 9
Rheological studies of compound 8

Angular frequency dependence of the storage modulus (G’) and loss modulus (G’’) of 8 gel in nitrobenzene.