

## Supporting Information

### Synthesis of D-glucono-1,4-lactones modified with linear saturated fatty acids, novel low molecular-weight organogelators, and evaluation of their physical properties

Shiro Komba\*

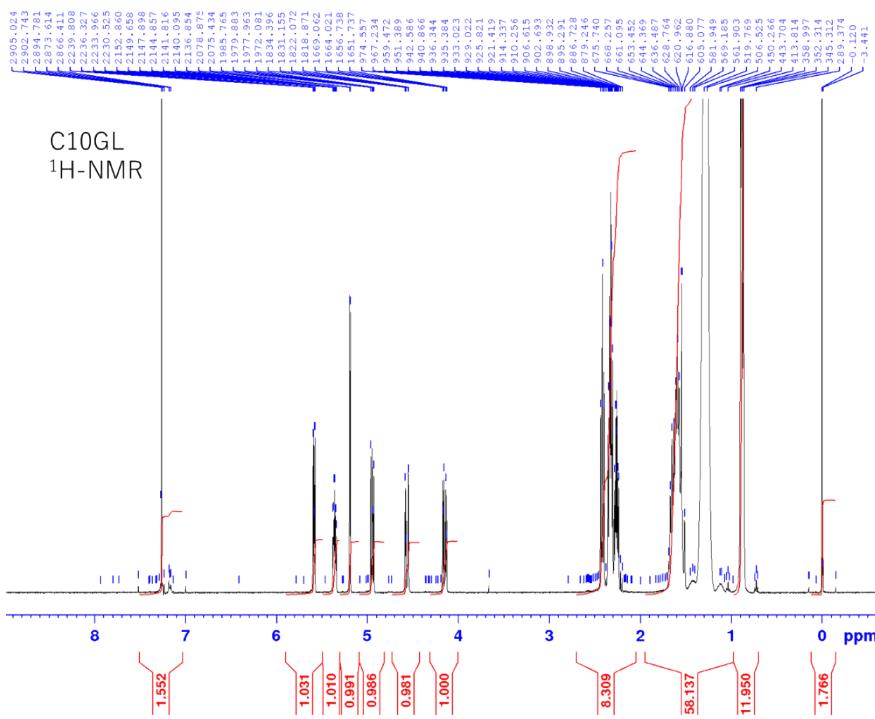
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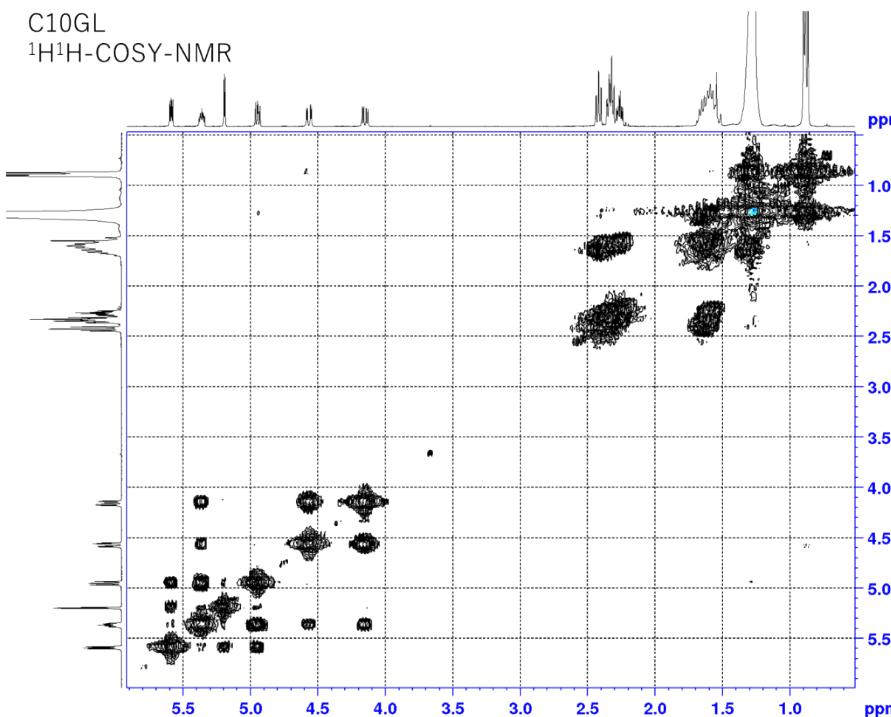
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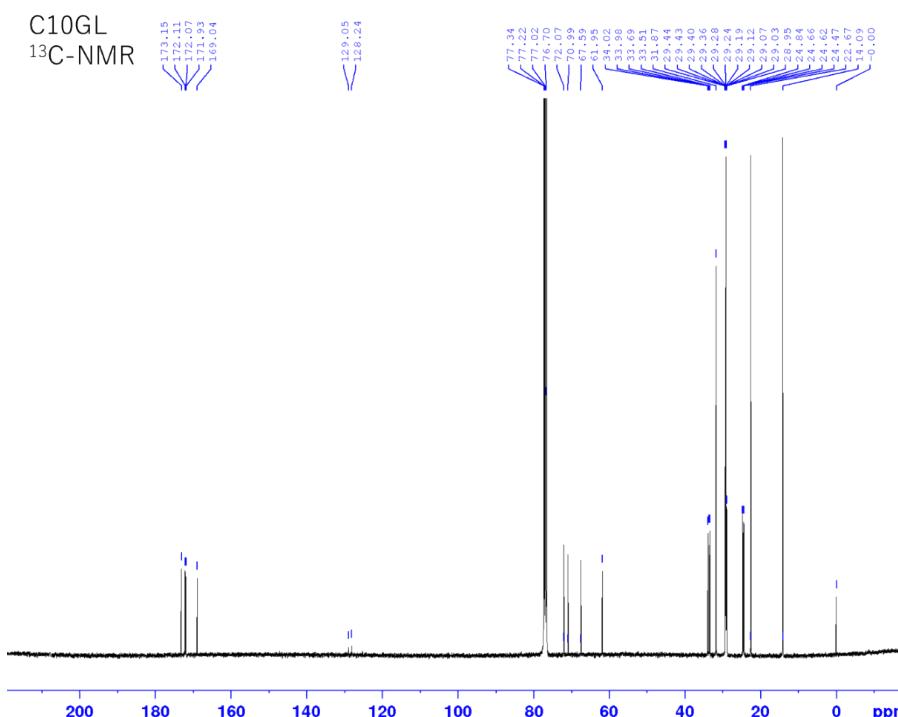
## 1. NMR charts



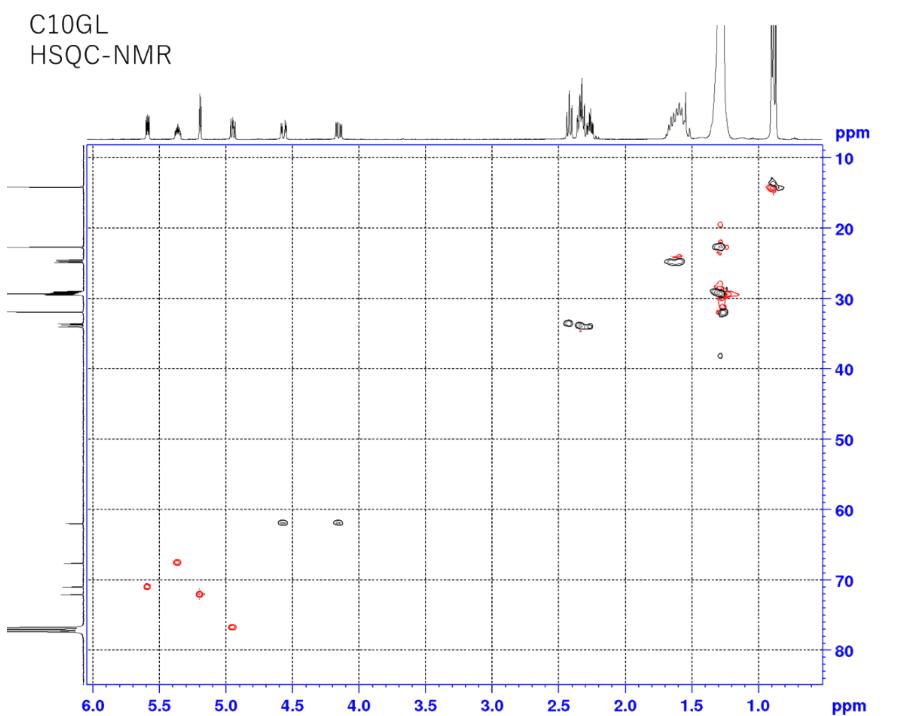
**Figure S1.** <sup>1</sup>H-NMR chart of C10GL (1).



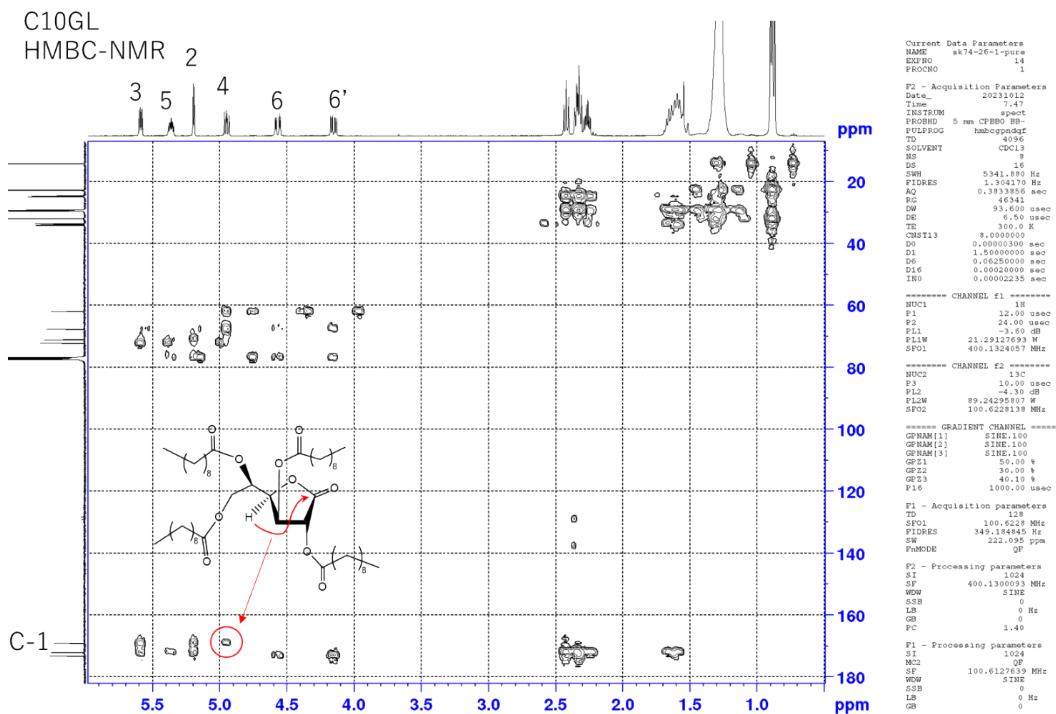
**Figure S2.** <sup>1</sup>H<sup>1</sup>H -COSY-NMR chart of C10GL (1).



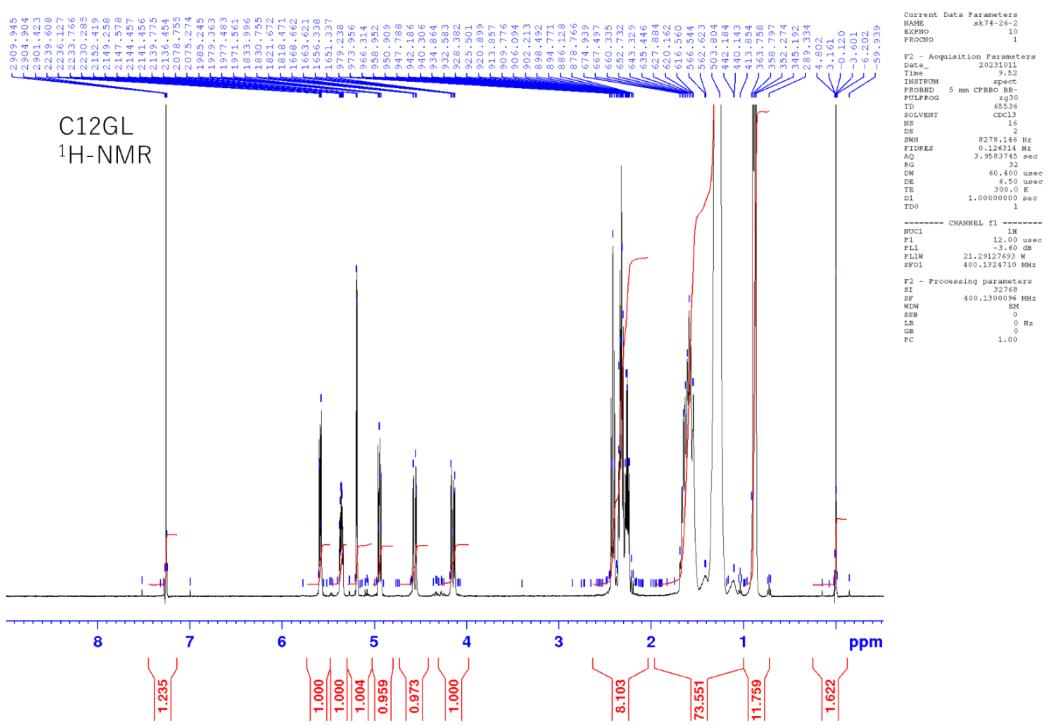
**Figure S3.**  $^{13}\text{C}$ -NMR chart of C10GL (**1**).



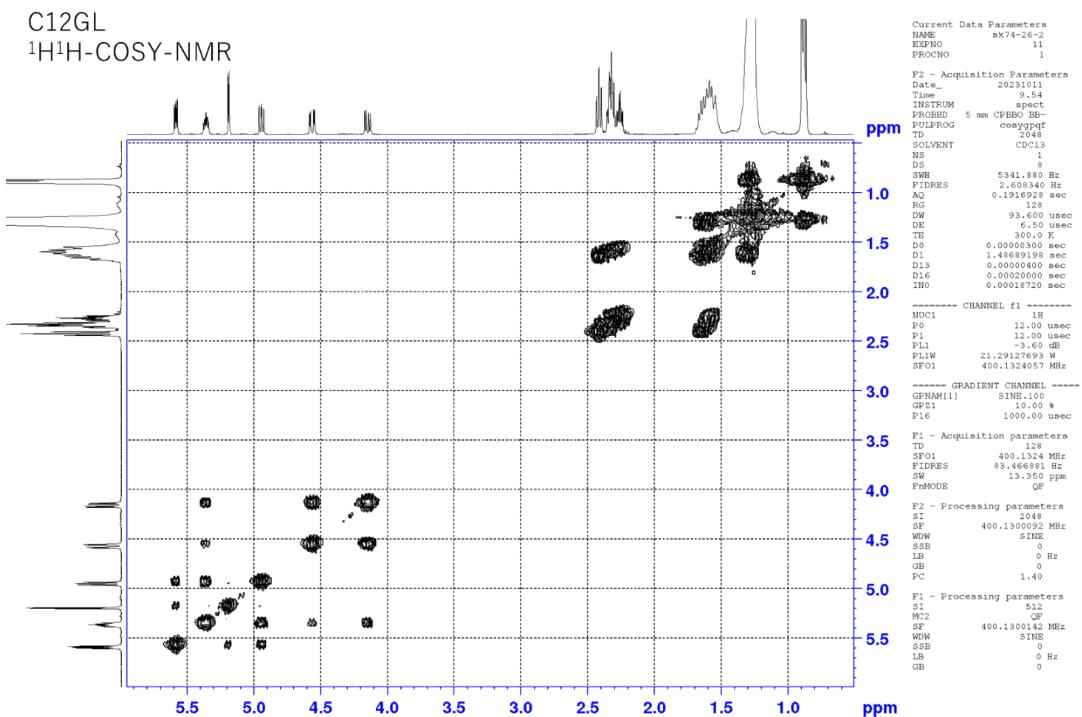
**Figure S4.** HSQC-NMR chart of C10GL (**1**).



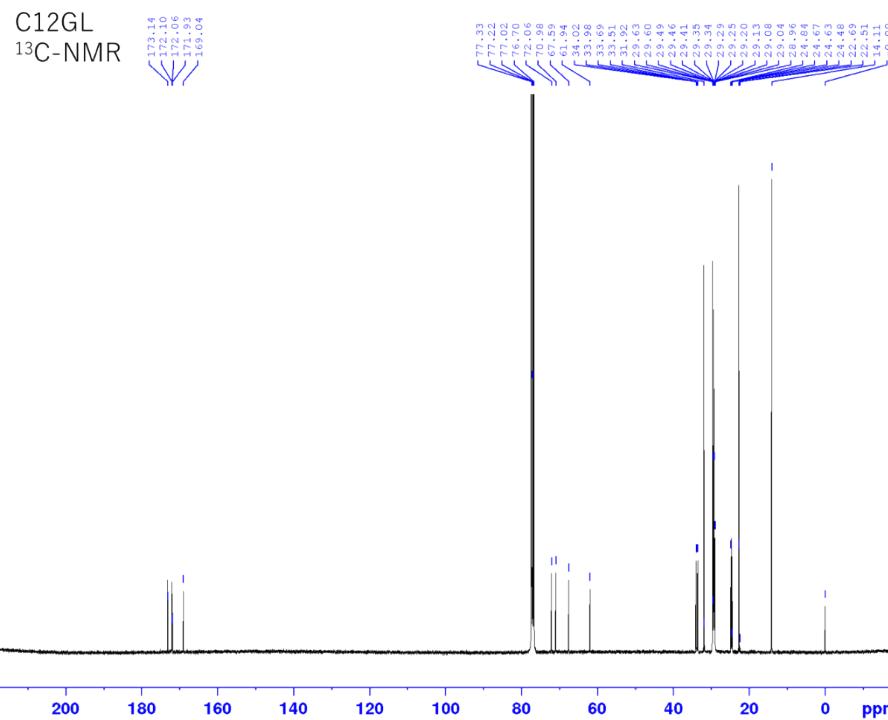
**Figure S5.** HMBC-NMR chart of C10GL (**1**).



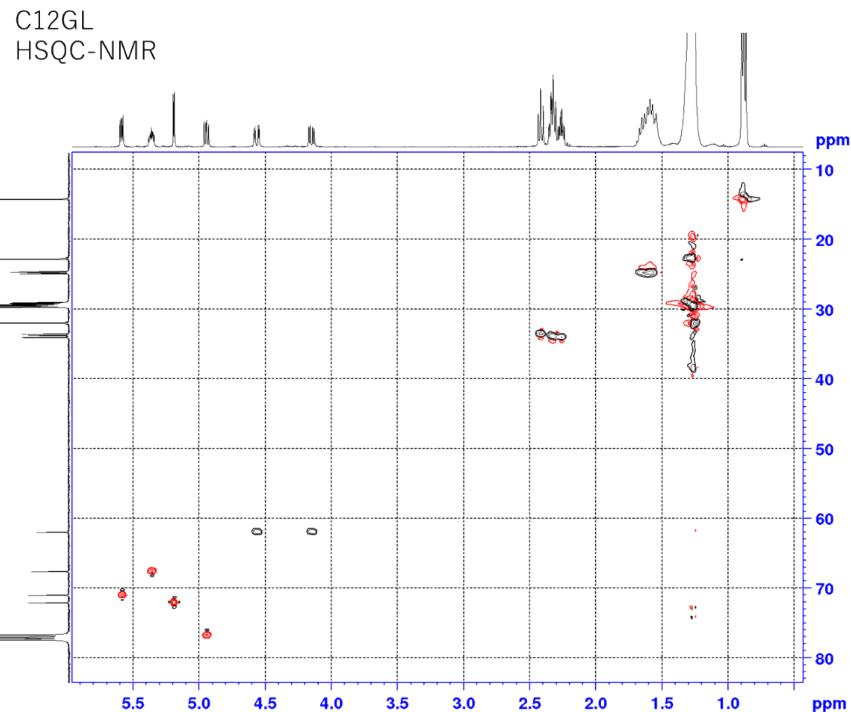
**Figure S6.**  $^1\text{H}$ -NMR chart of C12GL (2).



**Figure S7.**  $^1\text{H}^1\text{H}$ -COSY-NMR chart of C12GL (2).

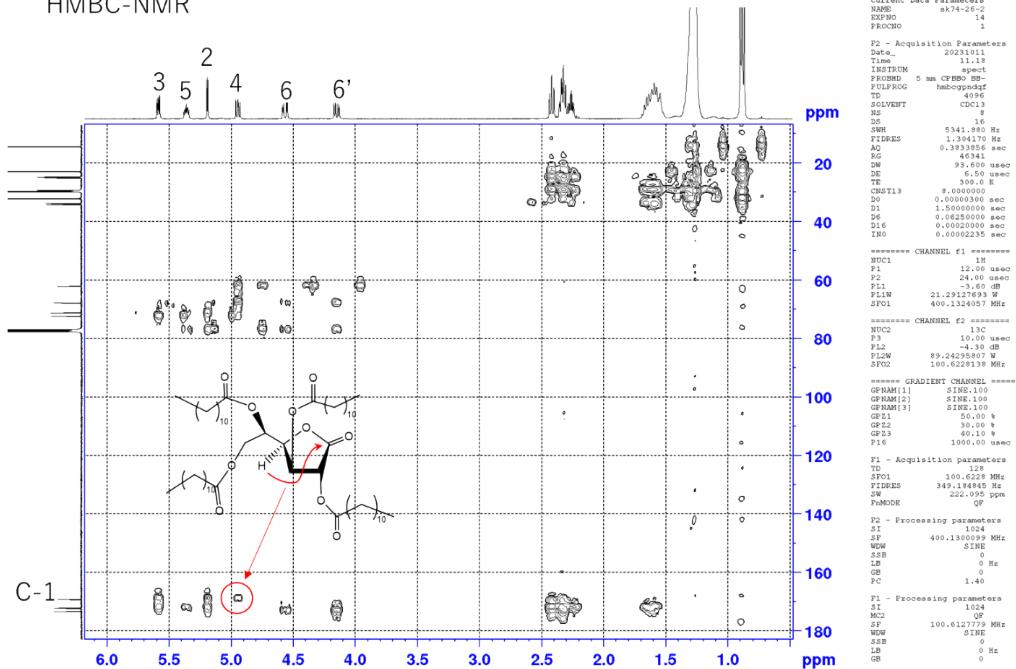


**Figure S8.** <sup>13</sup>C-NMR chart of C12GL (2).

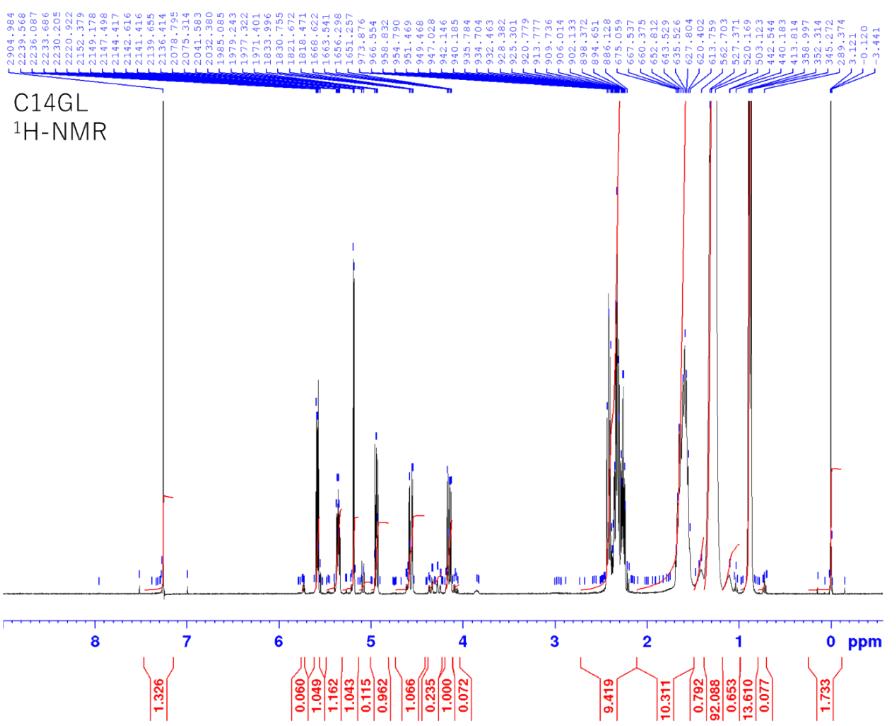


**Figure S9.** HSQC-NMR chart of C12GL (2).

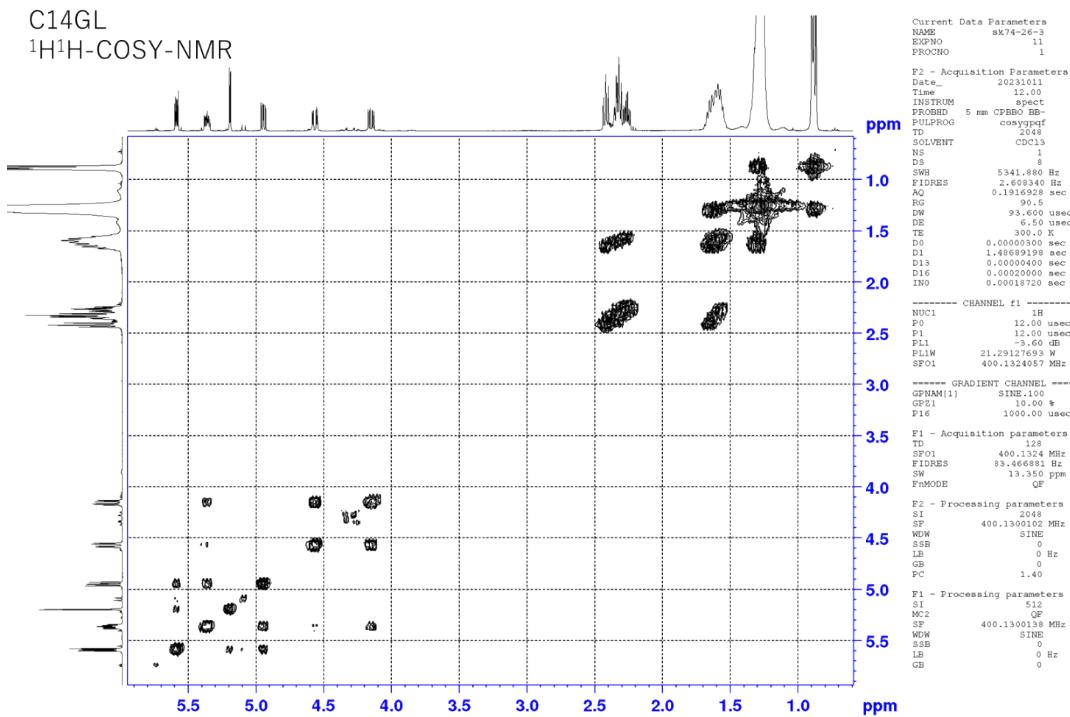
C12GL  
HMBC-NMR



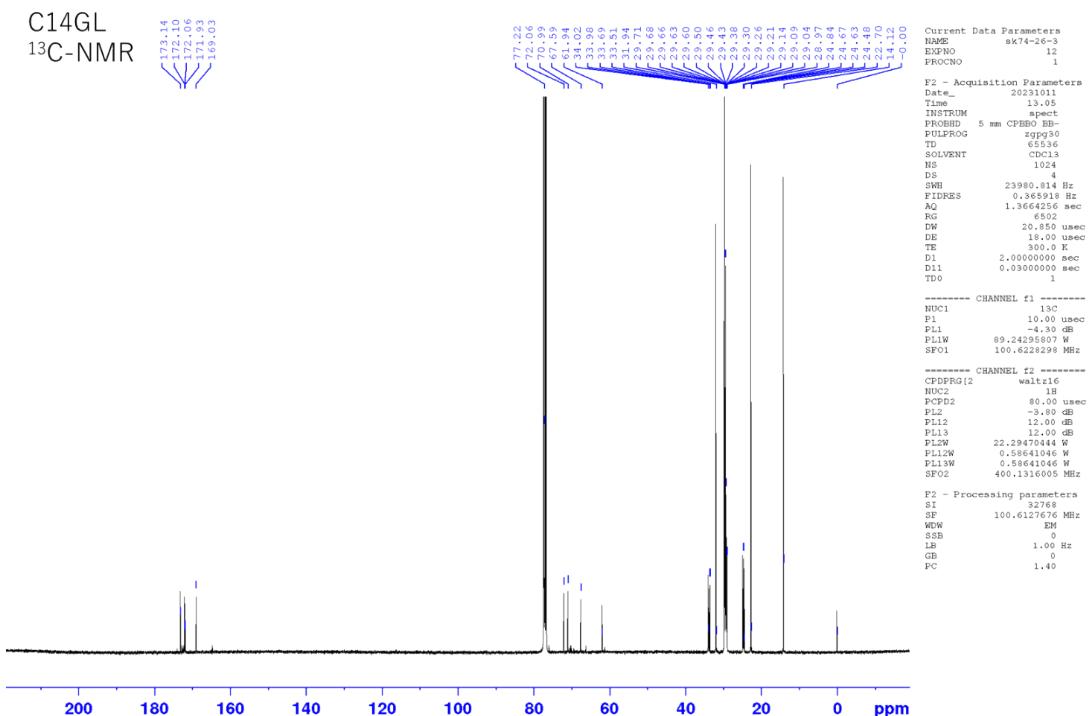
**Figure S10.** HMBC-NMR chart of C12GL (2).



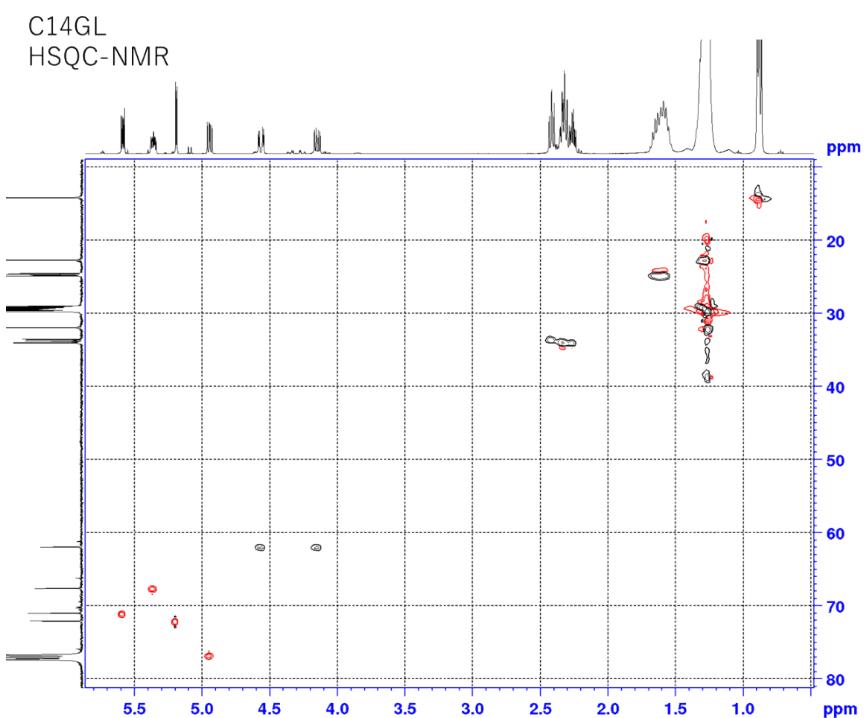
**Figure S11.**  $^1\text{H}$ -NMR chart of C14GL (3).



**Figure S12.**  $^1\text{H}^1\text{H}$ -COSY-NMR chart of C14GL (3).

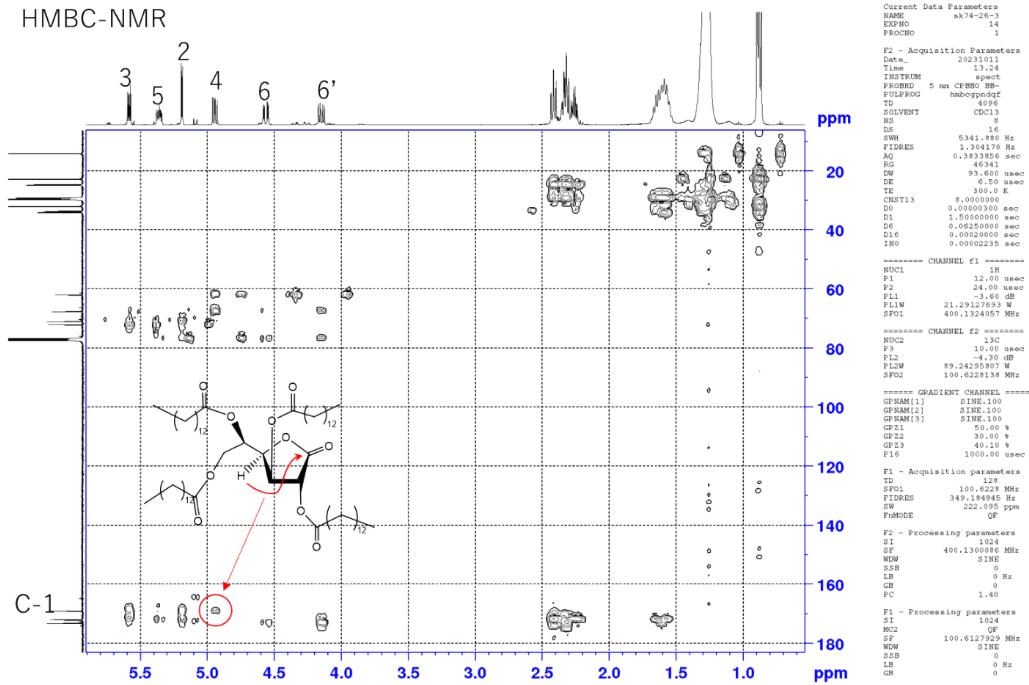


**Figure S13.**  $^{13}\text{C}$ -NMR chart of C14GL (**3**).

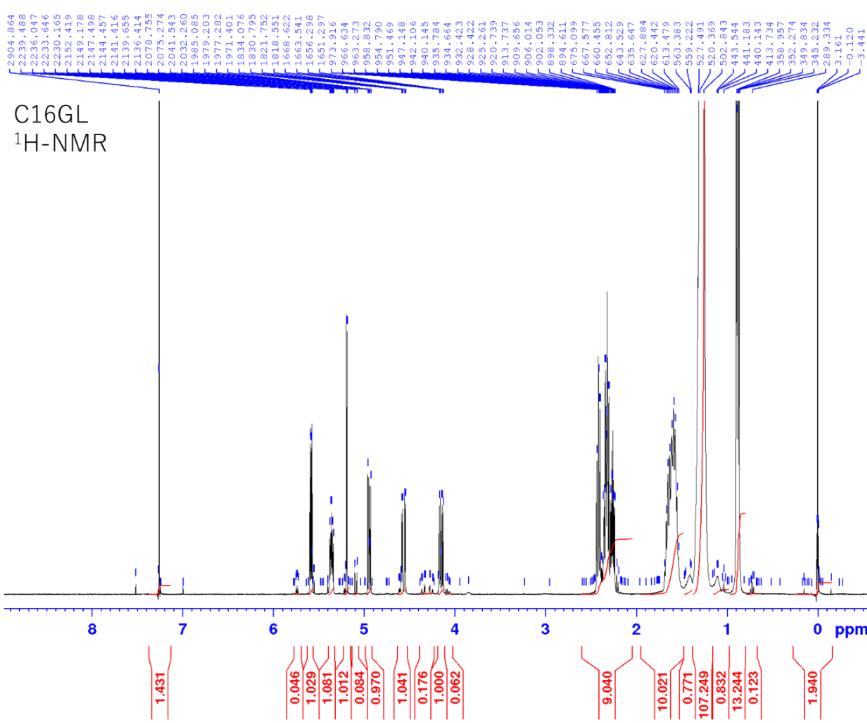


**Figure S14.** HSQC-NMR chart of C14GL (**3**).

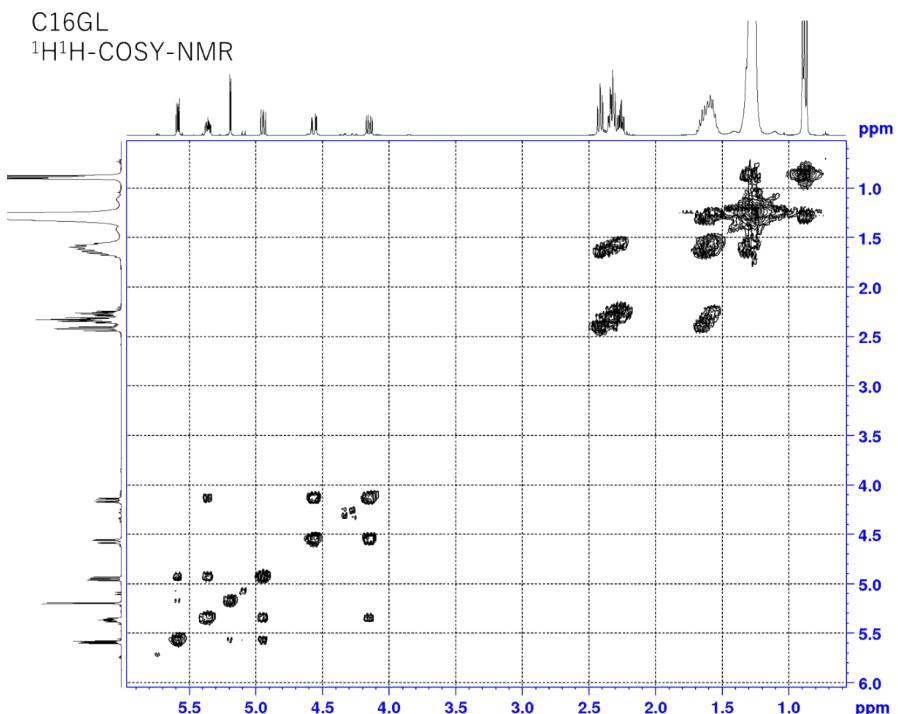
C14GL  
HMBC-NMR



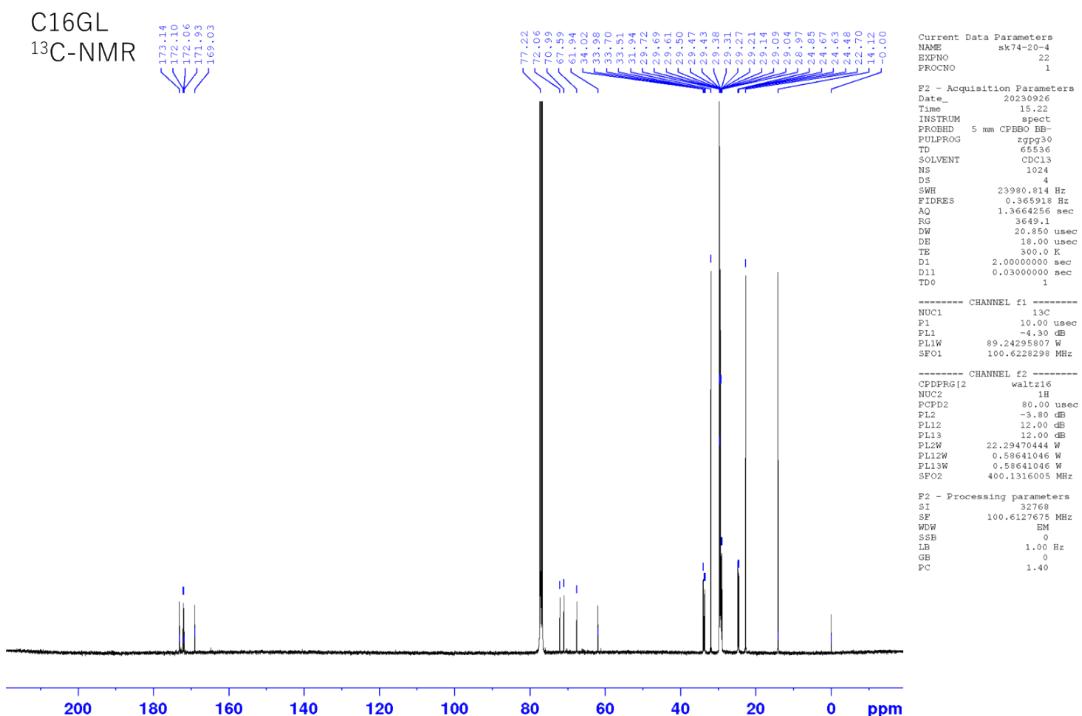
**Figure S15.** HMBC-NMR chart of C14GL (3).



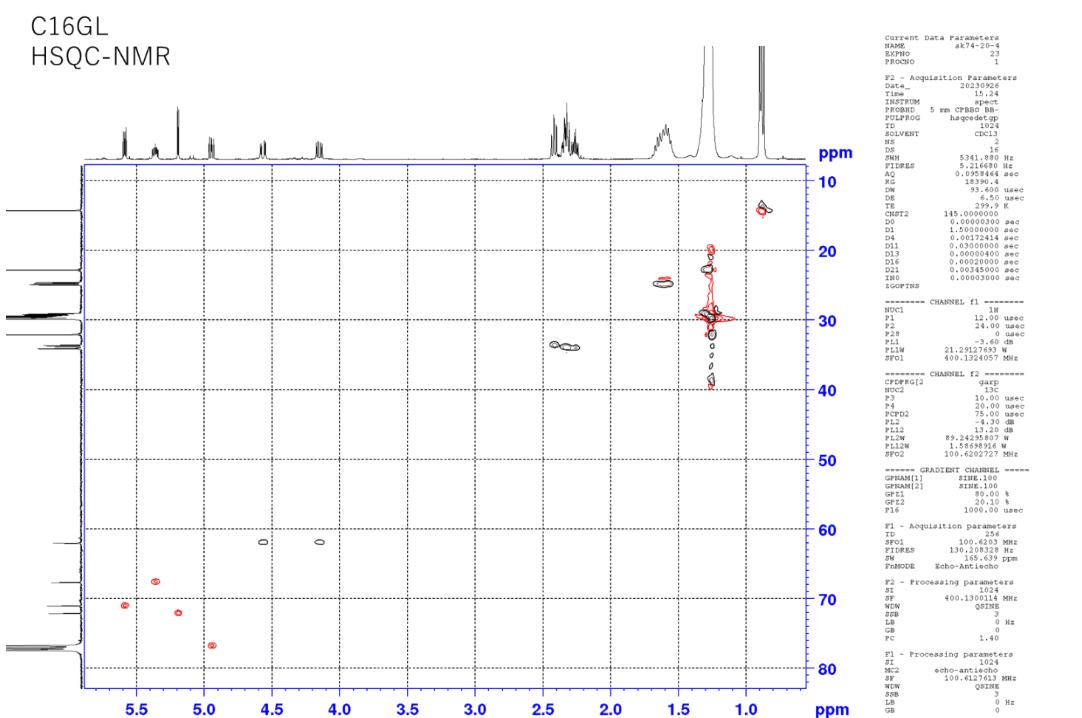
**Figure S16.**  $^1\text{H}$ -NMR chart of C16GL (4).



**Figure S17.**  $^1\text{H}^1\text{H}$ -COSY-NMR chart of C16GL (4).

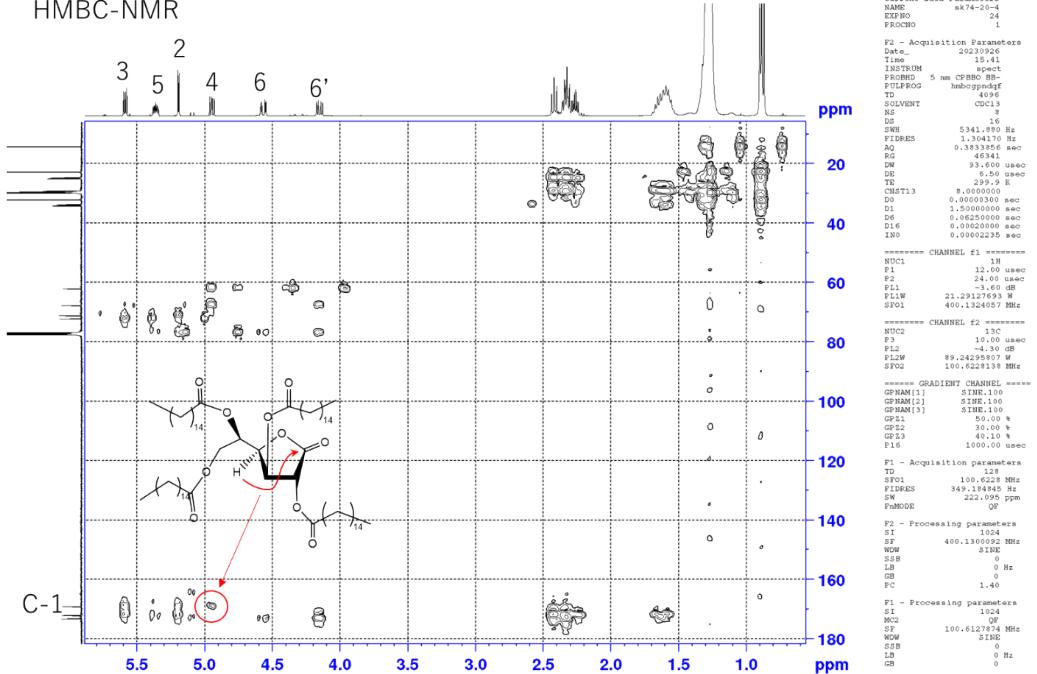


**Figure S18.**  $^{13}\text{C}$ -NMR chart of C16GL (**4**).

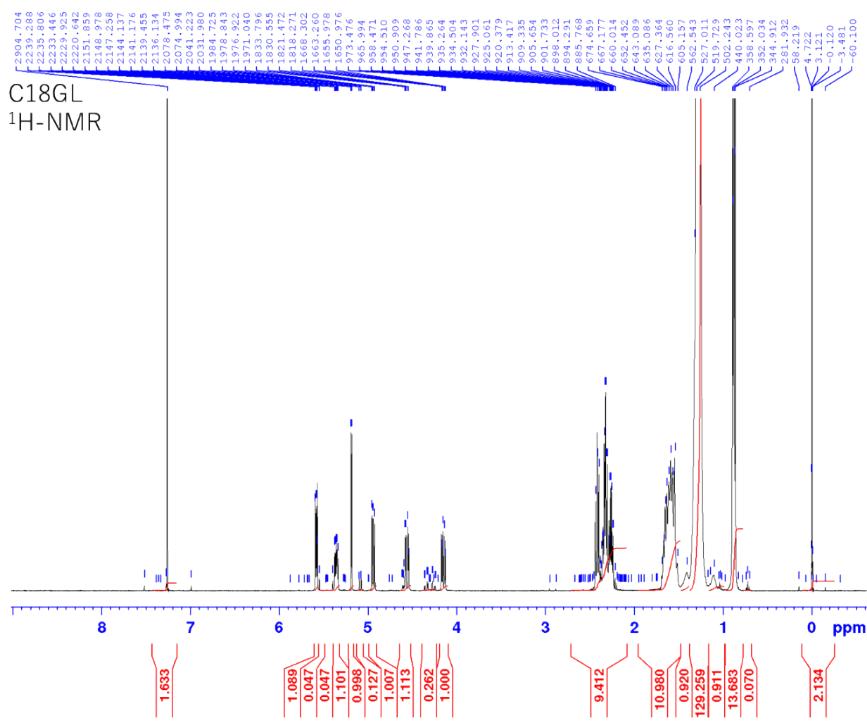


**Figure S19.** HSQC-NMR chart of C16GL (**4**).

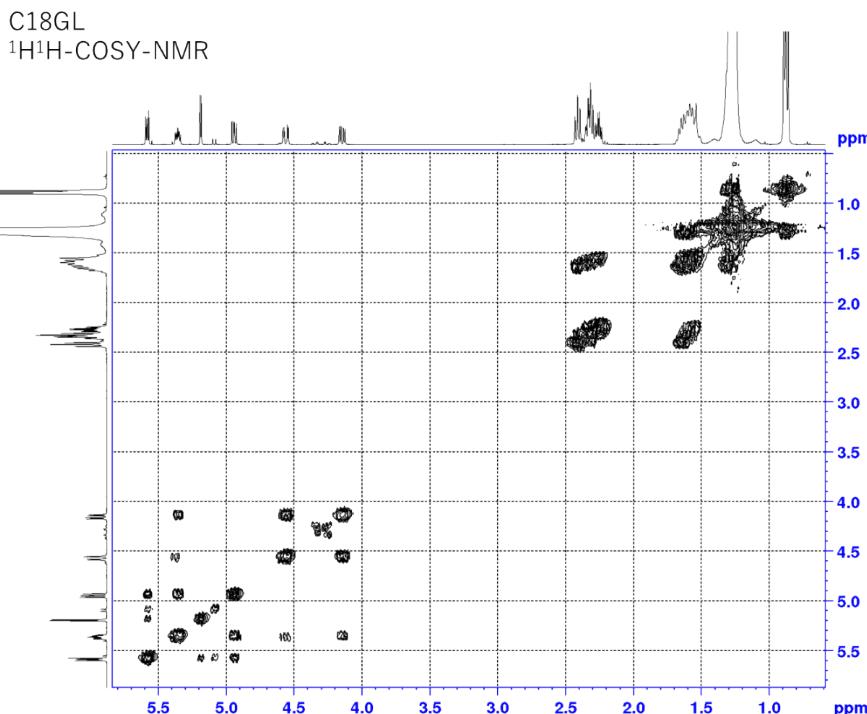
C16GL  
HMBC-NMR



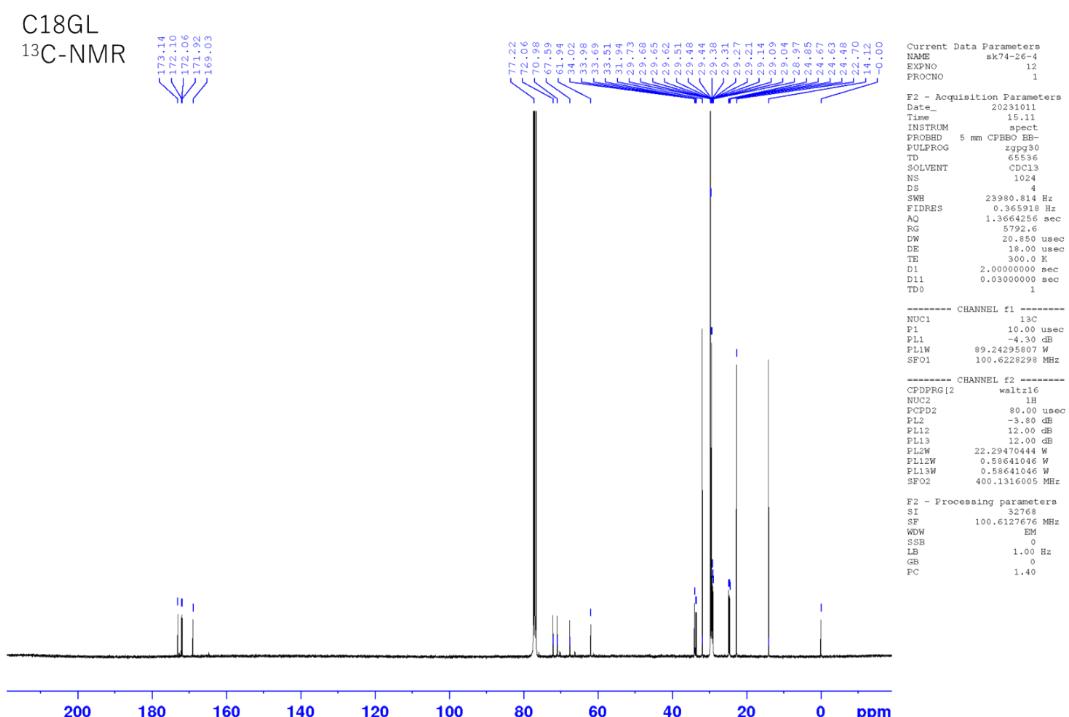
**Figure S20.** HMBC-NMR chart of C16GL (4).



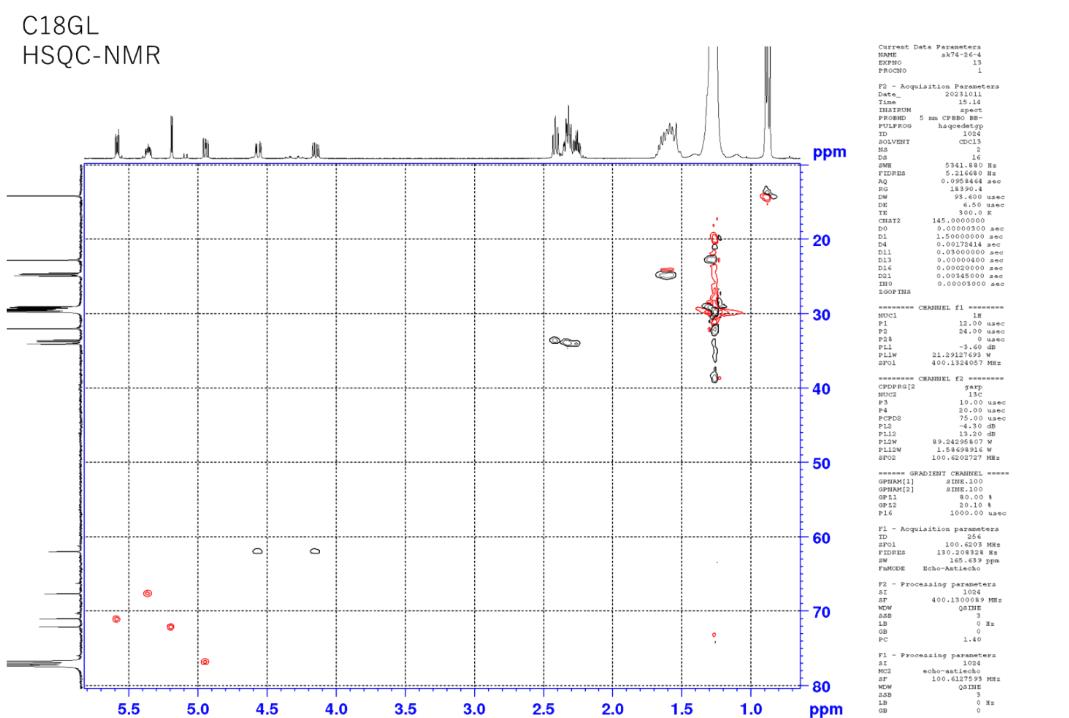
**Figure S21.**  $^1\text{H}$ -NMR chart of C18GL (**5**).



**Figure S22.**  $^1\text{H}^1\text{H}$ -COSY-NMR chart of C18GL (**5**).

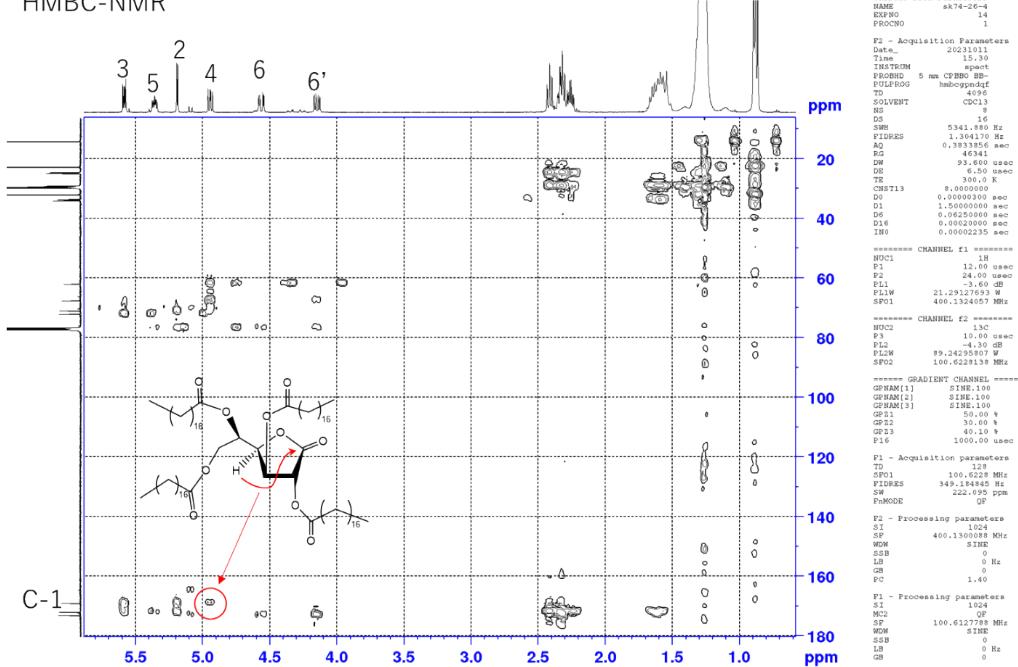


**Figure S23.**  $^{13}\text{C}$ -NMR chart of C18GL (**5**).

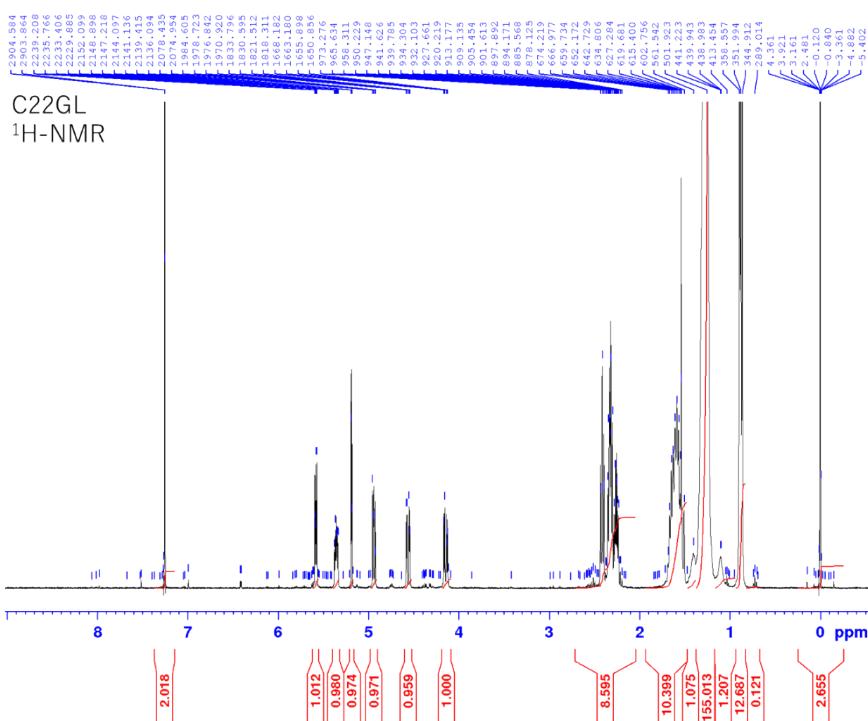


**Figure S24.** HSQC-NMR chart of C18GL (**5**).

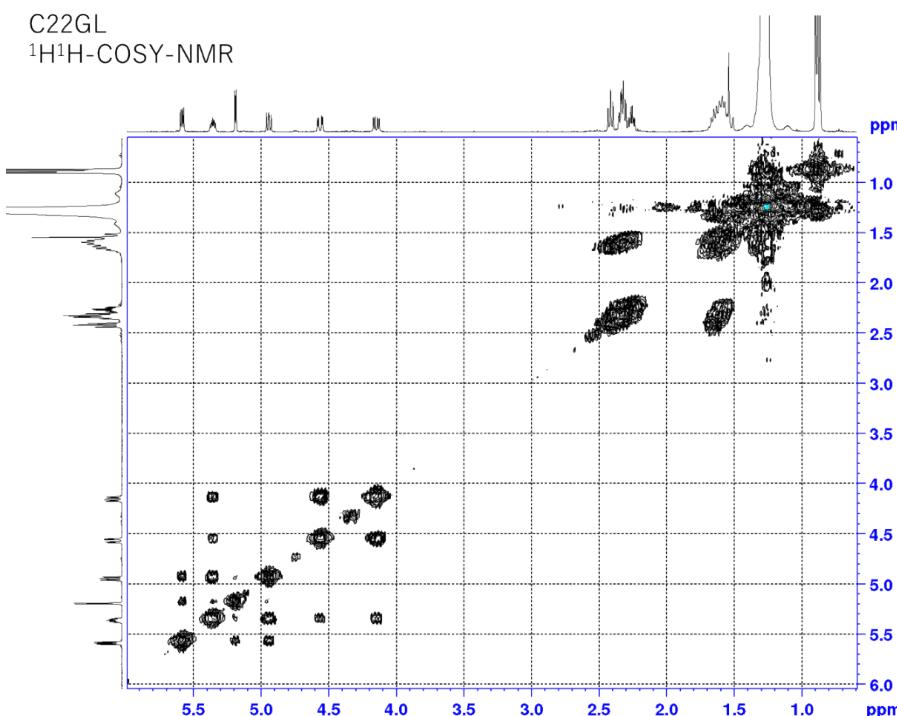
C18GL  
HMBC-NMR



**Figure S25.** HMBC-NMR chart of C18GL (**5**).



**Figure S26.**  $^1\text{H}$ -NMR chart of C22GL (**6**).



**Figure S27.**  $^1\text{H}^1\text{H}$ -COSY-NMR chart of C22GL (**6**).

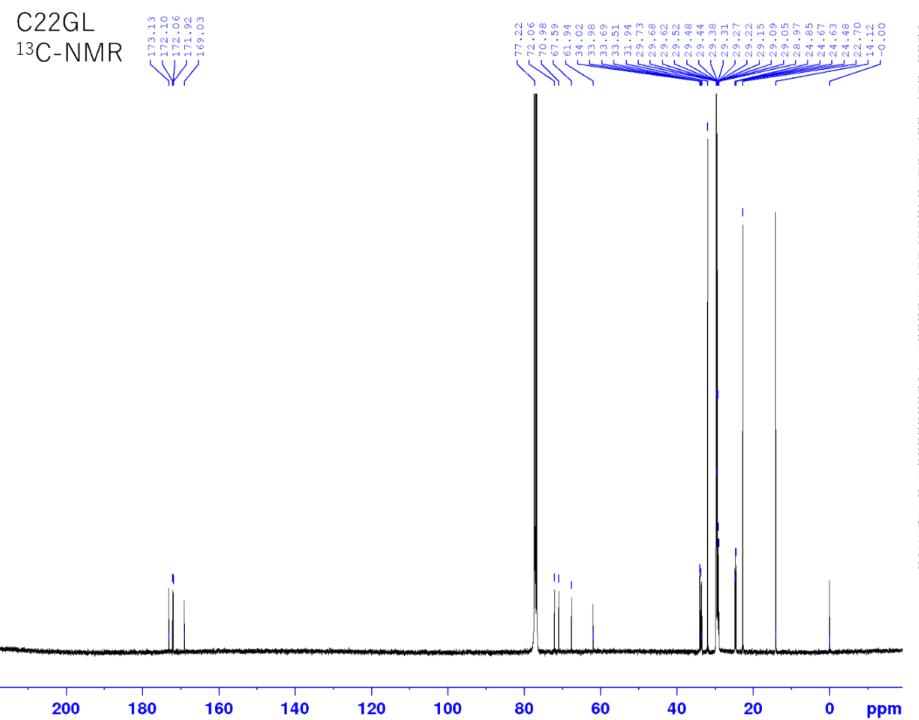


Figure S28.  $^{13}\text{C}$ -NMR chart of C22GL (6).

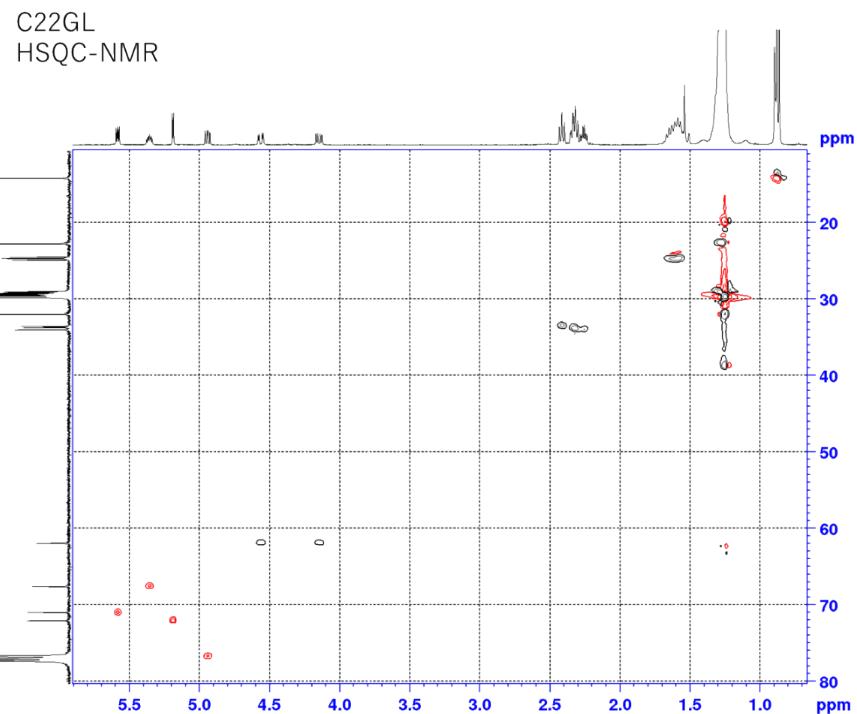
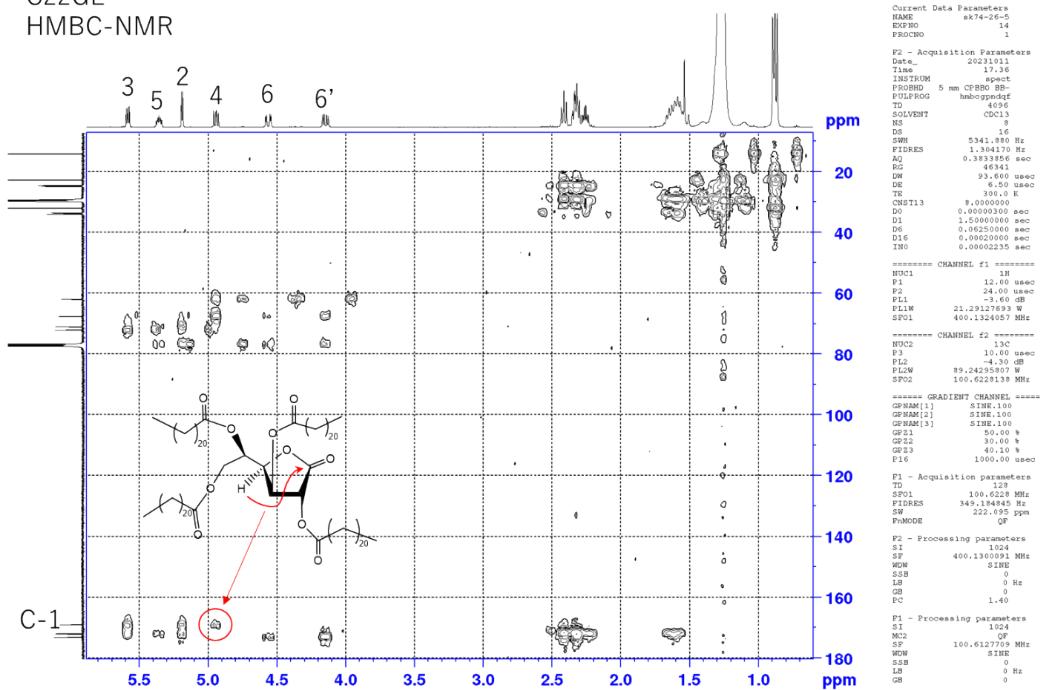
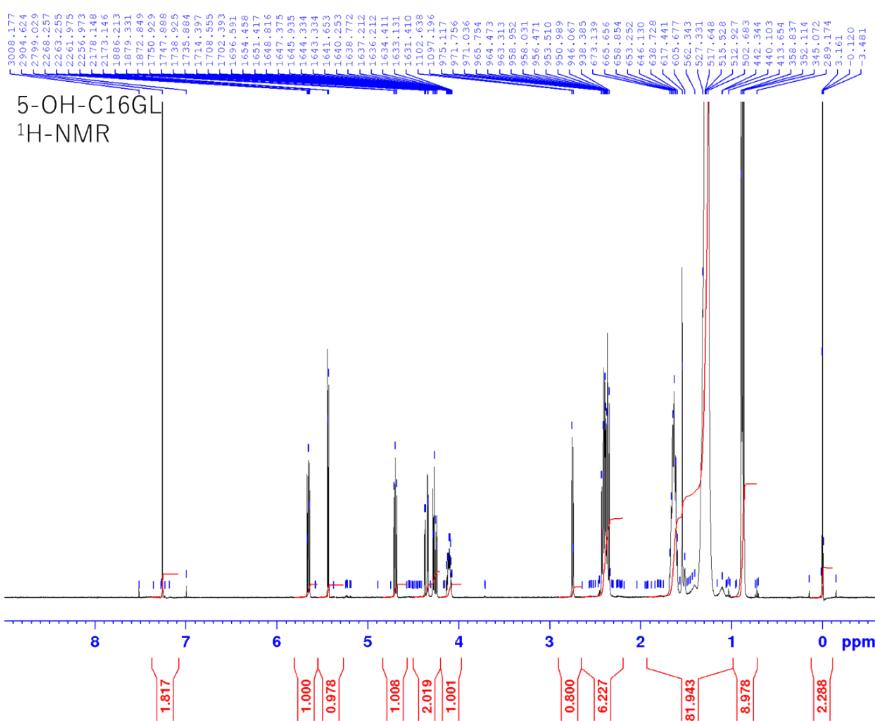


Figure S29. HSQC-NMR chart of C22GL (6).

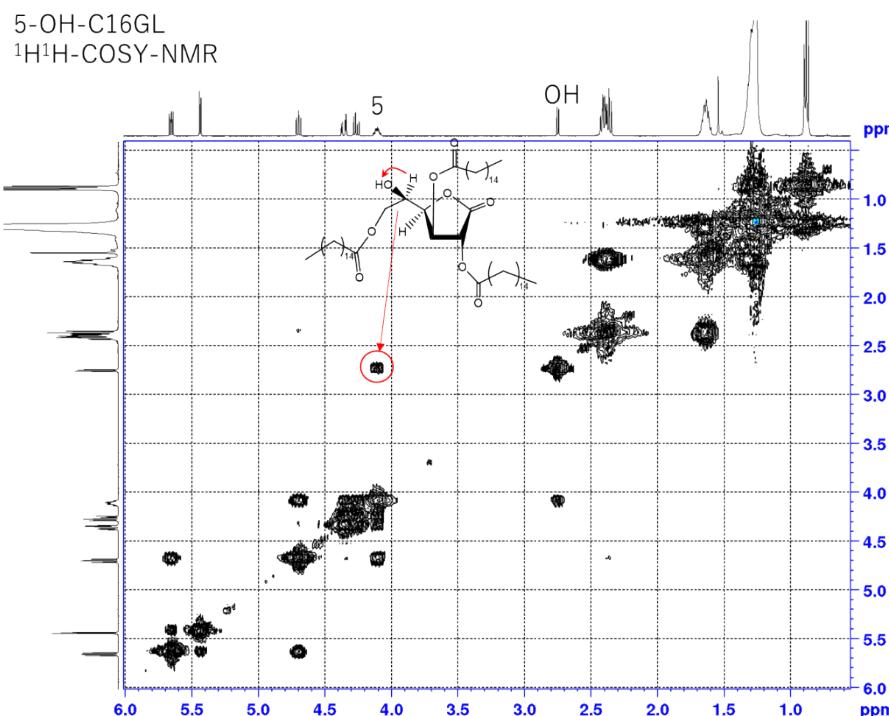
C22GL  
HMBC-NMR



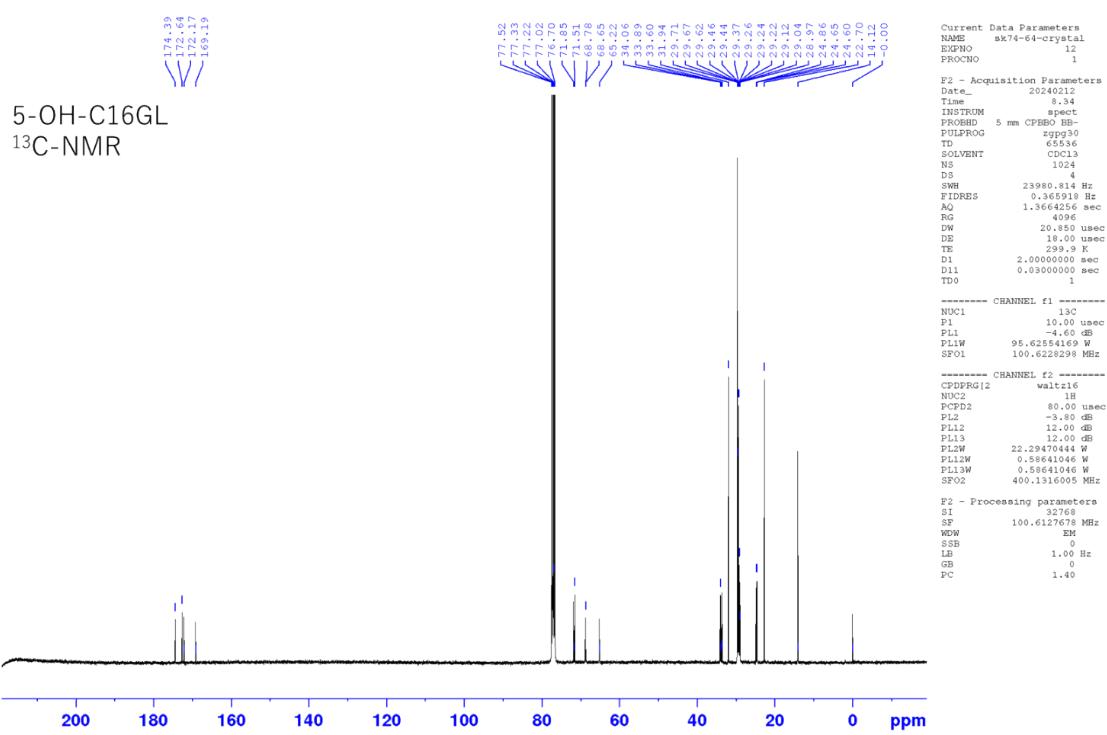
**Figure S30.** HMBC-NMR chart of C22GL (6).



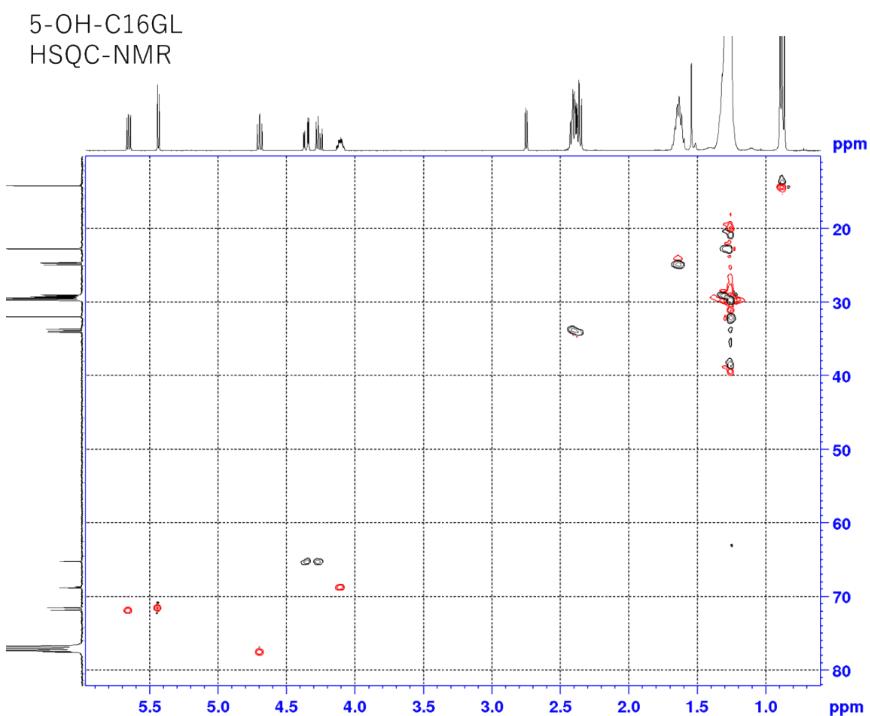
**Figure S31.** <sup>1</sup>H-NMR chart of 5-OH-C16GL (7).



**Figure S32.** <sup>1</sup>H<sup>1</sup>H-COSY-NMR chart of 5-OH-C16GL (7).

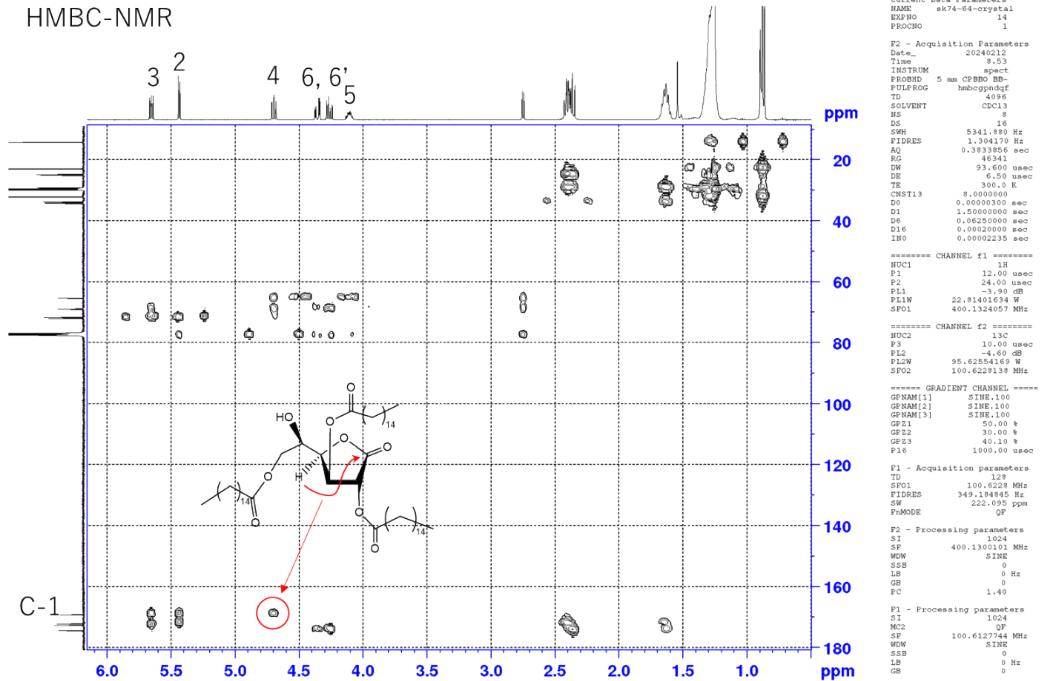


**Figure S33.**  $^{13}\text{C}$ -NMR chart of 5-OH-C16GL (7).



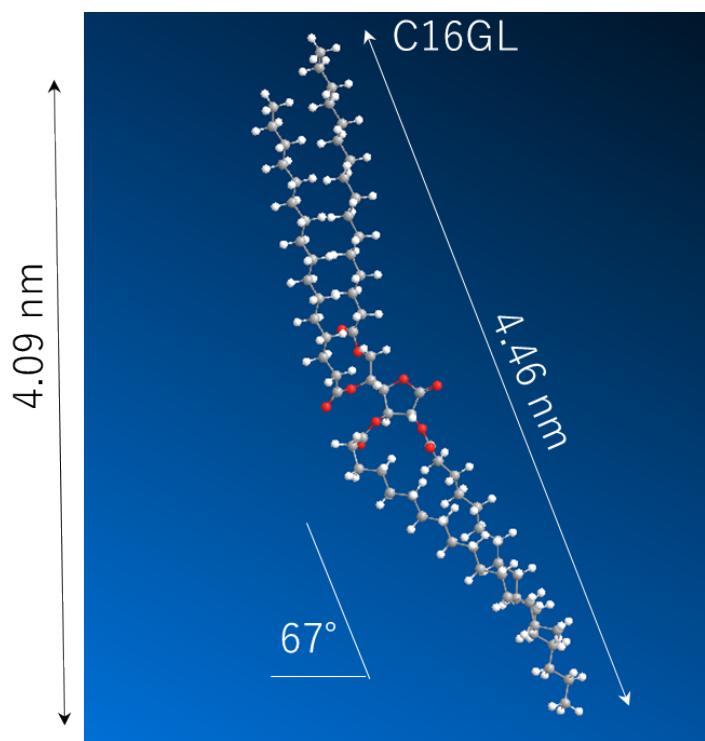
**Figure S34.** HSQC-NMR chart of 5-OH-C16GL (**7**).

5-OH-C16GL  
HMBC-NMR



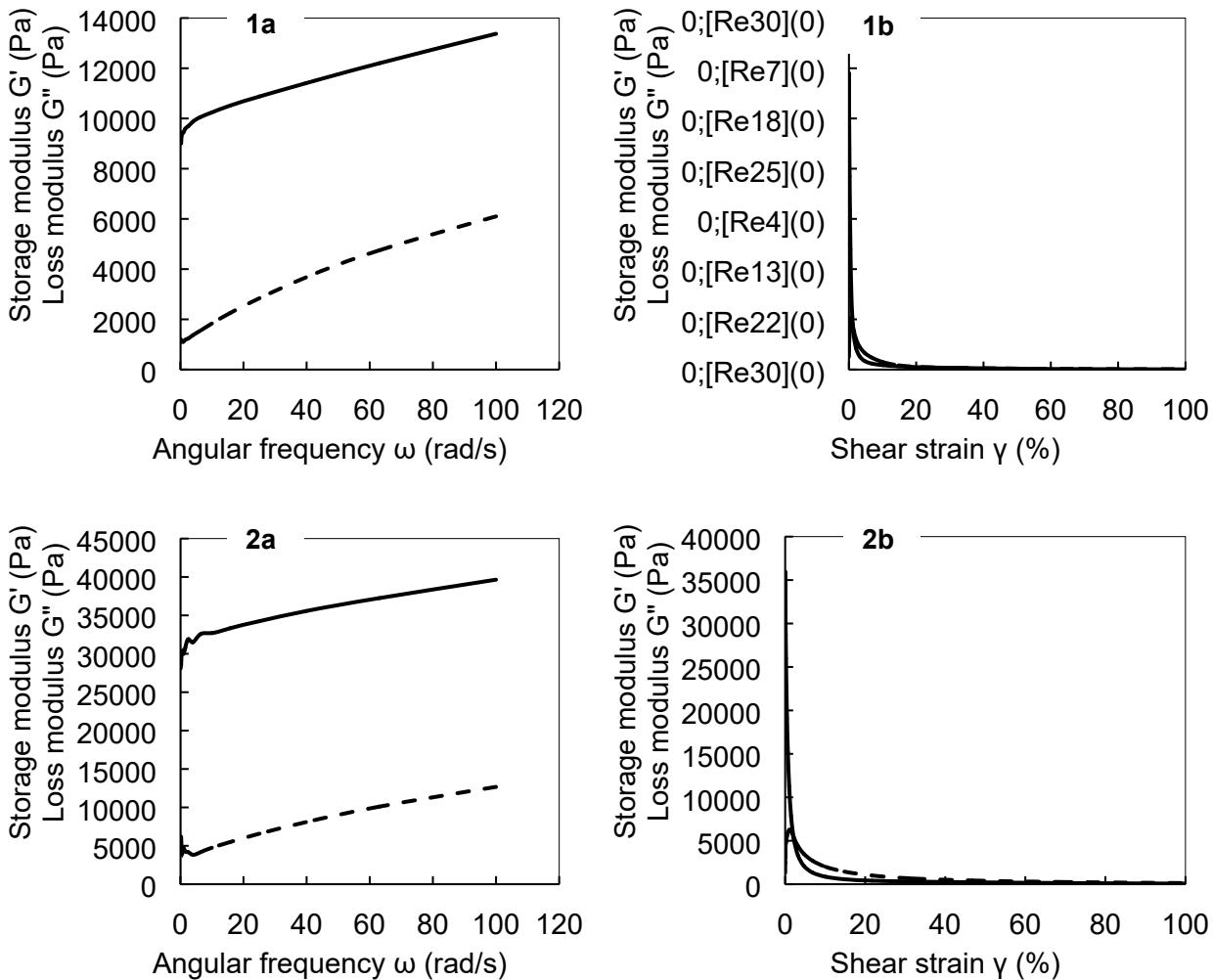
**Figure S35.** HMBC-NMR chart of 5-OH-C16GL (7).

## 2. Additional figures

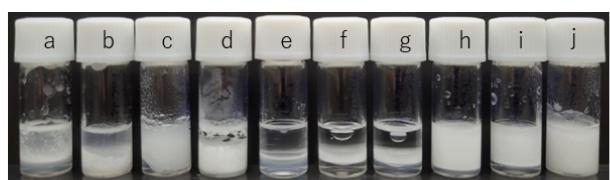


**Figure S36.** The ideal structure of C16GL (4) with the lowest thermal energy, calculated using MOPAC in Chem3D software (PerkinElmer Software).

Mopac Interface: Heat of Formation = -735.16404 Kcal/Mol.



**Figure S37.** Rheological measurements using a rheometer. Left column (**1a** and **2a**): Angular frequency ( $\omega$ ) dependent storage modulus  $G'$  (solid line) and loss modulus  $G''$  (dashed line). Shear strain ( $\gamma$ ) = 0.1%, gap = 0.76 mm, temperature = 20°C, 50 mm diameter parallel plate. **1a:** 5 wt% C16GL (**4**) in liquid paraffin #350 gel. **2a:** 5 wt% C18GL (**5**) in liquid paraffin #350 gel. Right column (**1b** and **2b**): Shear strain ( $\gamma$ ) dependent storage modulus  $G'$  (solid line) and loss modulus  $G''$  (dashed line). Angular frequency ( $\omega$ ) = 0.5 rad/s, gap = 0.76 mm, temperature = 20°C, 50 mm diameter parallel plate. **1b:** 5 wt% C16GL (**4**) in liquid paraffin #350 gel. **2b:** 5 wt% C18GL (**5**) in liquid paraffin #350 gel.



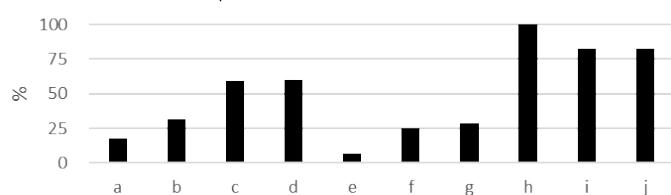
The images were converted using ImageJ software.

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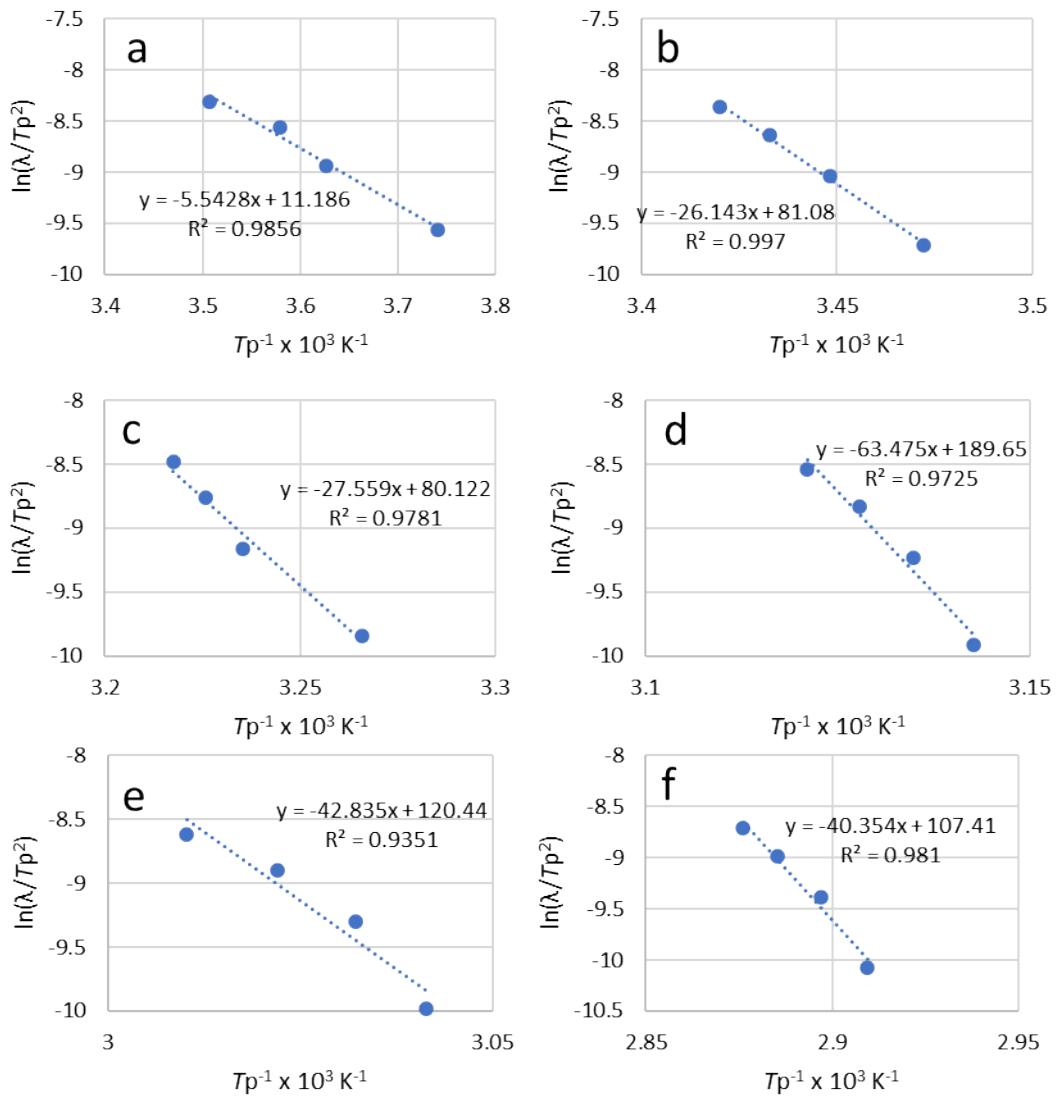
2: Adjust threshold



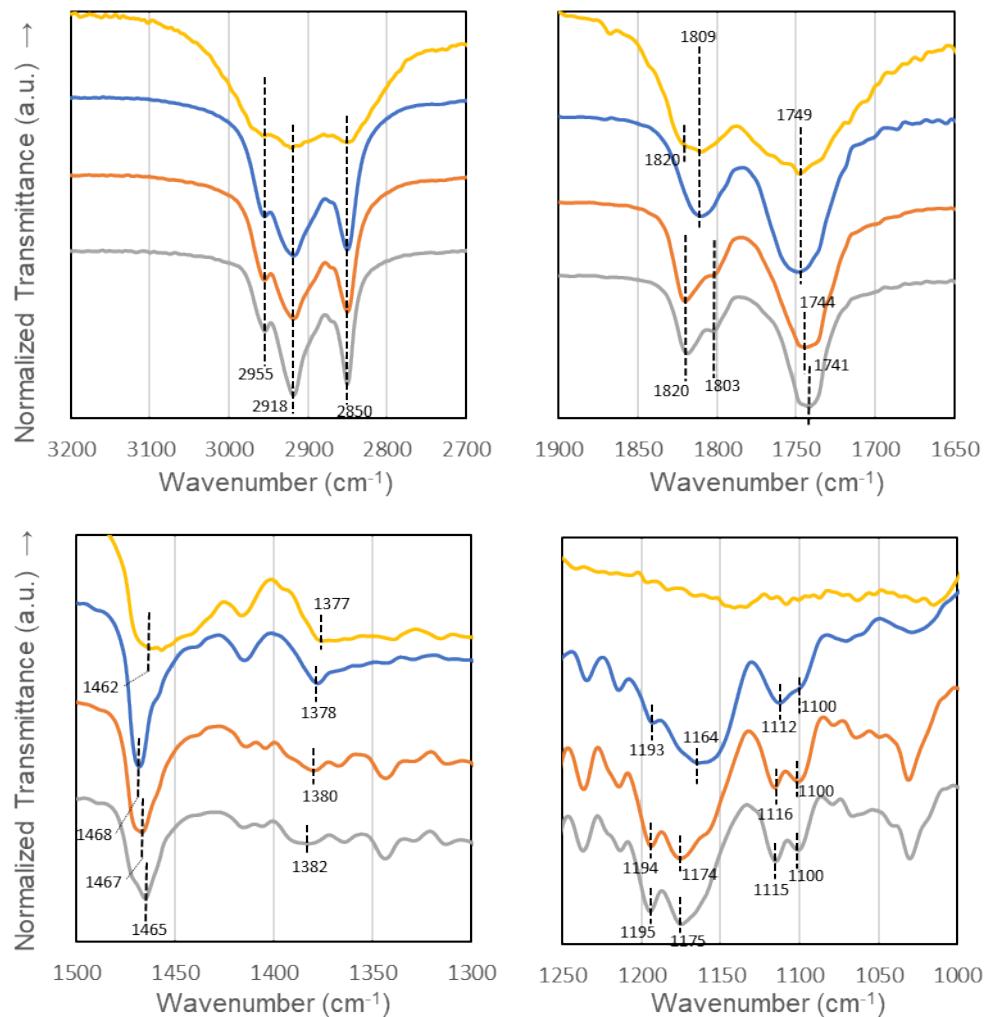
The area of cream was measured.



**Figure S38.** How to determine the area of the cream. After the image was converted using ImageJ software, the area of the cream was measured and graphed.



**Figure S39.** Kissinger plots to determine the activation energy of cold crystallization in DSC at different heating rates. The activation energy is obtained by multiplying the slope by the gas constant,  $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ .  $T_p$  = peak cold crystallization temperature on heating [K],  $\lambda$  = temperature rate during heating [ $\text{K min}^{-1}$ ]. a: C10GL (1), b: C12GL (2), c: C14GL (3), d: C16GL (4), e: C18GL (5), f: C22GL (6).



**Figure S40.** FT-IR spectra of type I, type II, and type III crystals and solution (at 100°C) of C18GL (5). Type I crystal (blue line). Type II crystal (orange line). Type III crystal (gray line). Solution at 100°C (yellow line).