Supporting information

Giant amino acids designed on the polysaccharide scaffold and their protein-like structural interconversion

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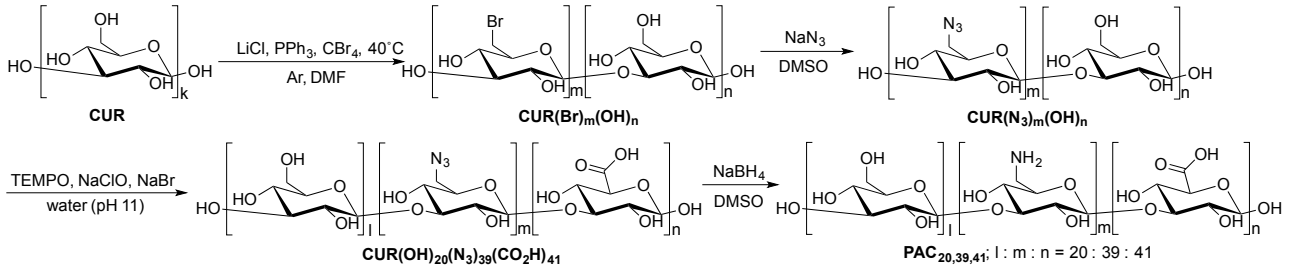

Scheme SI-1, Synthesis of **$PAC_{20,39,41}$**.

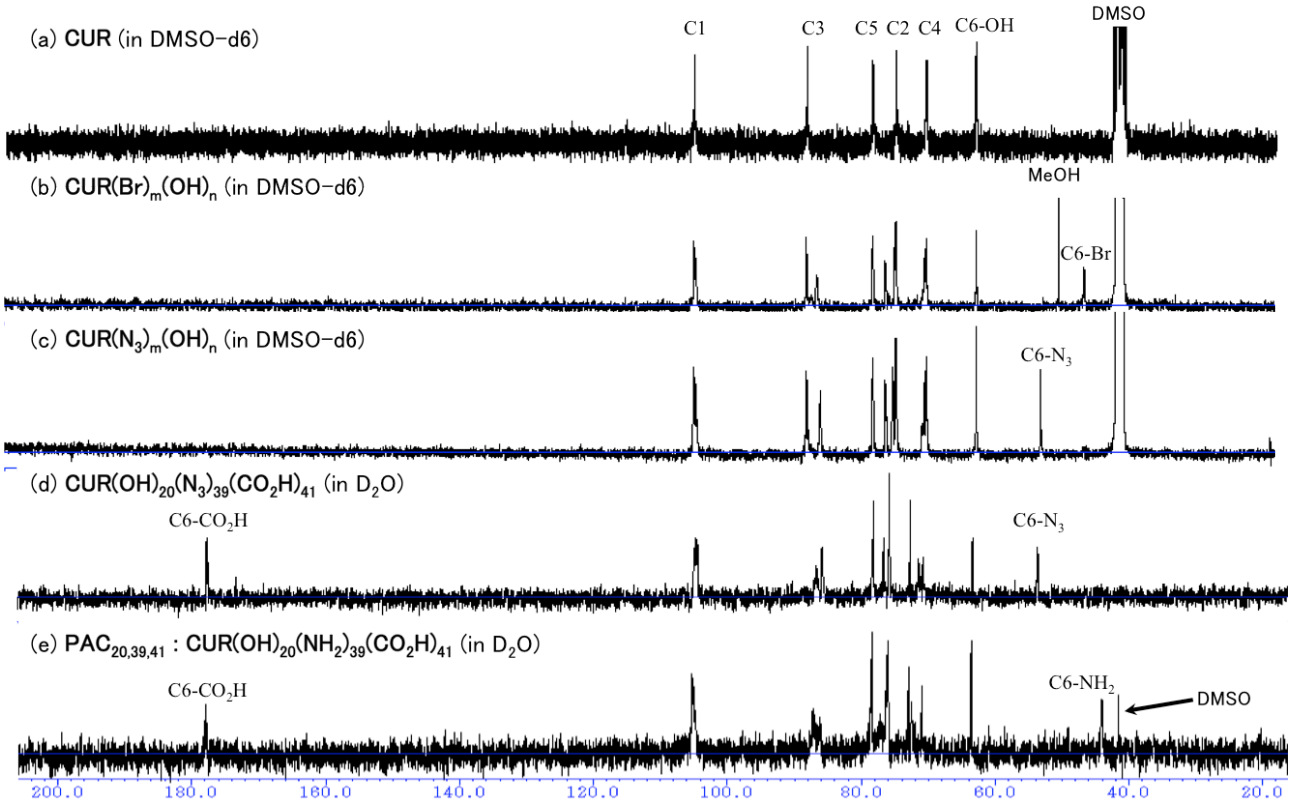

Figure SI-1. ^{13}C NMR spectra of the intermediates, and product of the synthesis of **$PAC_{20,39,41}$**. (a) curdlan, (b) **$CUR(Br)_m(OH)_n$**, (c) **$CUR(N_3)_m(OH)_n$** (d) **$CUR(OH)_l(N_3)_m(CO_2H)_n$** (e) **$PAC_{20,3941}$**.

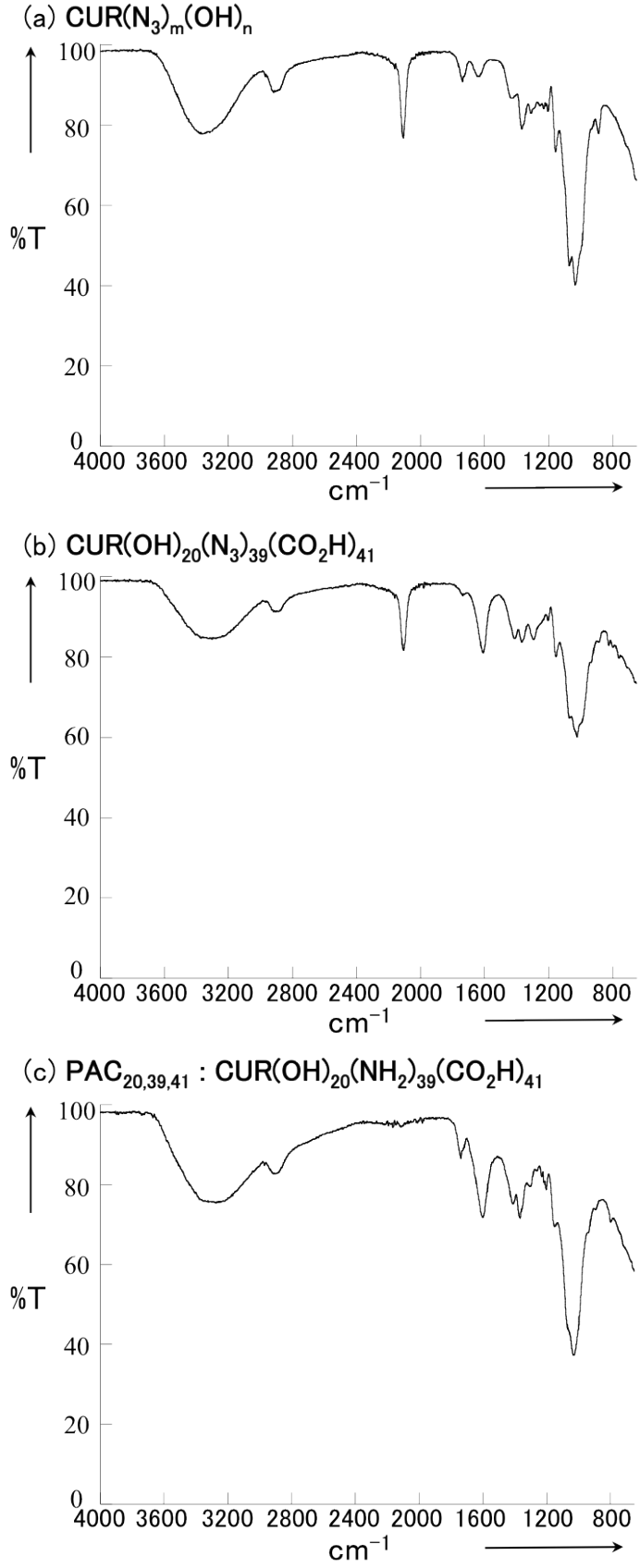

Figure SI-2. IR spectra of the intermediates and product of the synthesis of **$PAC_{20,39,41}$**, (a) **$CUR(N_3)_m(OH)_n$** (b) **$CUR(OH)_l(N_3)_m(CO_2H)_n$** (c) **$PAC_{20,3941}$**.

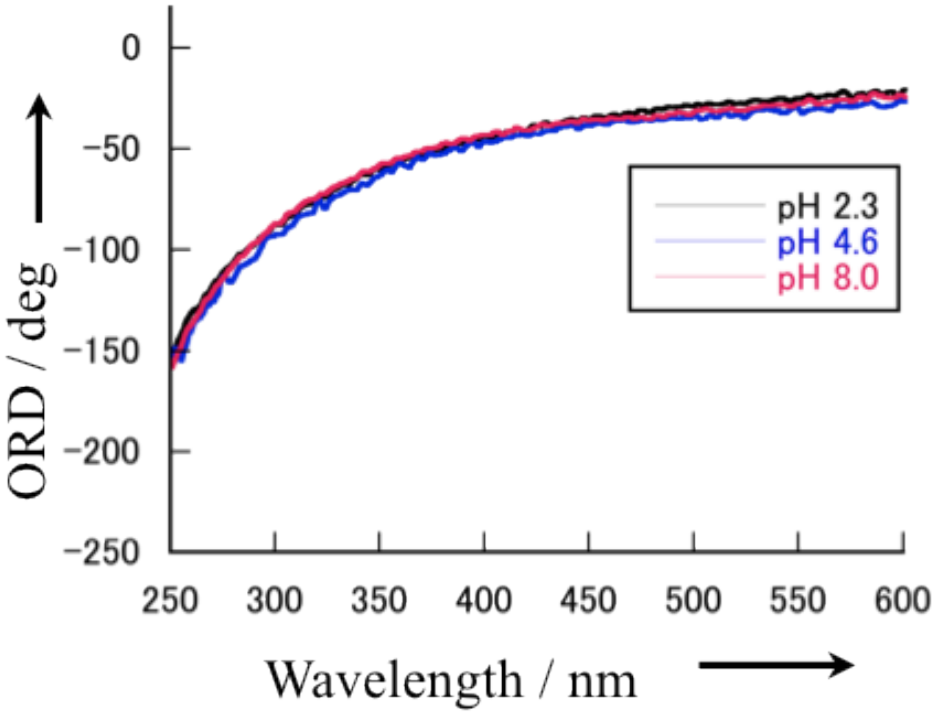

Figure SI-3. ORD spectra of **CAC**$_{40,60}$ in pH 2.3, pH4.6, or pH 8.0.

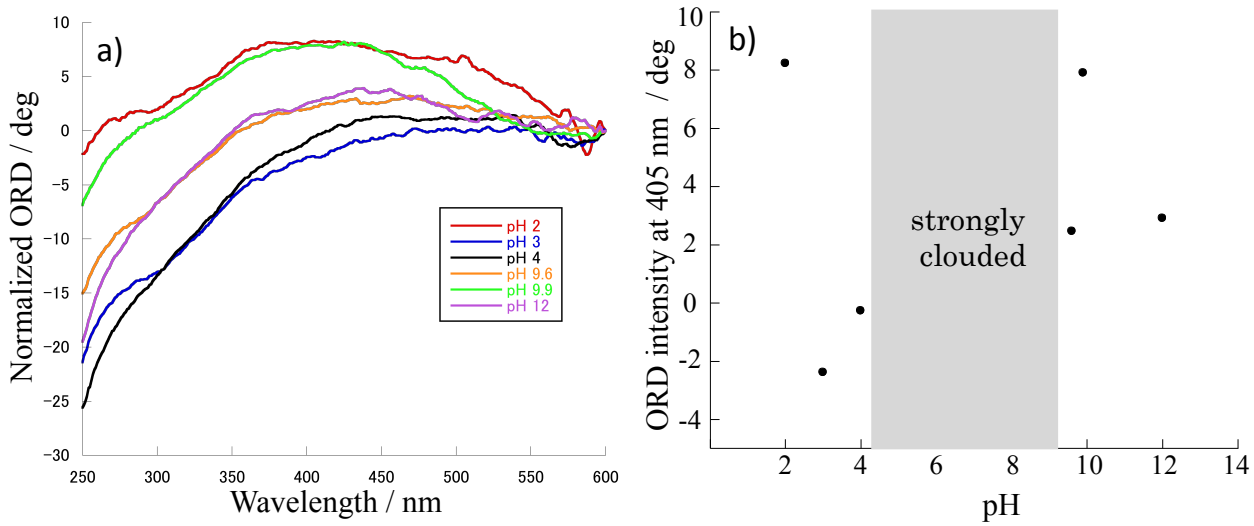

Figure SI-4. a) ORD spectral change of **PAC$_{63,27,10}$** (20 mM) upon the pH change; b) Plots of the ORD intensity of **PAC$_{63,27,10}$** at 405 nm upon the pH change. The sample solutions were strongly clouded at pH 5 ~ 9.

In this study, when we measured the ORD spectral change with consecutive pH change from pH 2.0 to pH 12 ([PAC$_{63,27,10}$] = 20 mM), the ORD spectra supporting triple-helix formation of PAC$_{63,27,10}$ was observed at pH 2.0, and 9.9. In contrast, the PAC solution showed the spectra supporting random structure formation at pH 3, 4, 9.6, and 12. However, the sample solutions were strongly clouded at pH 5 ~ 9.

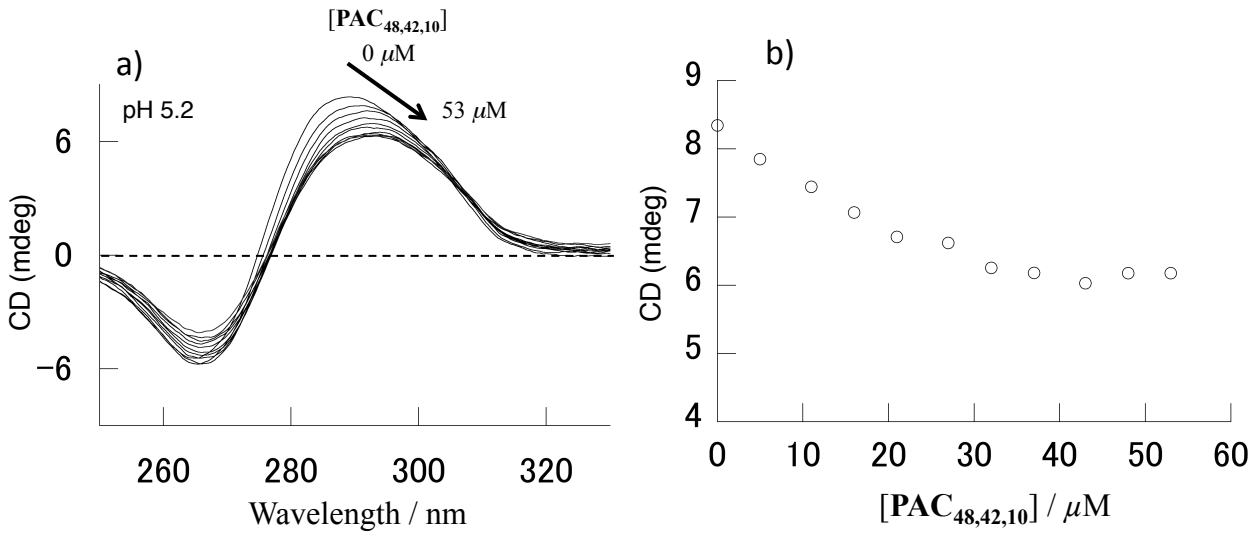

Figure SI-5, a) CD spectral change of **dC$_{30}$** (1 μM) upon the addition of **PAC$_{48,42,10}$** at pH 5.2, b) Plots of the CD intensity of **PAC$_{48,42,10}$** at 290 nm upon upon the addition of **PAC$_{48,42,10}$** at pH 5.2. A 10 cm quartz cell was used in this study.