

Title

Formation of gold nanoparticles by glycolipids of *Lactobacillus casei*

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Keywords

autoxidation, biomineralization, glycolipid, gold nanoparticle, *Lactobacillus casei*

Fig. S1. (a) Auric acid solution (1: 0 mM K[AuCl₄], 2: 0.25 mM K[AuCl₄], 3: 0.5 mM K[AuCl₄]) without *L. casei* cells and their UV/VIS spectra after 24 h. (b) Auric acid solution (1: 0 mM K[AuCl₄], 2: 0.25 mM K[AuCl₄], 3: 0.5 mM K[AuCl₄]) with *L. casei* cells (0.25 g/L) their UV/VIS spectra after 24 h. (c) Auric acid solution (1: 0 mM K[AuCl₄], 2: 0.25 mM K[AuCl₄], 3: 0.5 mM K[AuCl₄]) with *L. casei* cells (1.0 g/L) their UV/VIS spectra after 24 h. (d) Auric acid solution (1: 0 mM K[AuCl₄], 2: 0.25 mM K[AuCl₄], 3: 0.5 mM K[AuCl₄]) with *L. casei* cells (2.0 g/L) their UV/VIS spectra after 24 h. The green line: 0 mM K[AuCl₄], the blue line: 0.25 mM K[AuCl₄] and the red line: 0.5 mM K[AuCl₄] in UV/VIS spectra.

Fig. S2. (a) Magnified image of the cell from *L. casei* treated with Au(+) solution. (b) The size distribution of nanoparticles in the image of (a).

Fig. S3. The visual of each solution in the cell. 1: Pure water, 2: the supernatant of Au(-) after ultrasonication. 3: the supernatant of Au(+) after ultrasonication.

Fig. S4. MALDI-TOF-MS spectra of Au(-) extract (a) and Au(+) extract (b).

Fig. S5. MALDI-TOF/TOF-MS spectra of 939.6 (a), 953.6 (b), 967.6 (c), 981.6 (d) and 969.3 (e) peaks.

Fig. S6. DQF-COSY spectrum of DGDG.

Fig. S7. HSQC spectrum of DGDG.

Fig. S8. HMBC spectrum of DGDG.

Fig. S9. The schematic representation of the correlations from DQF-COSY and HMBC.

Fig. S10. (a) MALDI-TOF-MS spectrum of the extract from spot 2 in Fig. 3 (c). (b) MALDI-TOF-MS analysis of Au(-) extract. (c) MALDI-TOF-MS analysis of Au(+) extract.

Fig. S11. MALDI-TOF/TOF-MS spectra of 1101.2 (a), 1115.2 (b), 1129.2 (c) and 1143.2 (d) peaks.

Fig. S12 (a) Auric acid solution (0.25 mM K[AuCl₄]) with DGDG purified from the TLC plate (1: 0 µg/mL, 2: 5.0 µg/mL, 3: 40 µg/mL, 4: 160 µg/mL) and their UV/VIS spectra after 24 h. The blue line: 0 mg/mL DGDG, the red line: 5.0 µg/mL DGDG, the green line: 40 µg/mL DGDG, the purple line: 160 µg/mL in UV/VIS spectra. (b) The size distribution of nanoparticles in the image of Fig. 4f.

Fig. S13 (a) Auric acid solution (0.5 mM K[AuCl₄]) with caDGDG (1: 0 µg/mL, 2: 10 µg/mL, 3: 50 µg/mL, 4: 100 µg/mL) and their UV/VIS spectra after 24 h. The blue line: 0 mg/L DGDG, the red line: 10 µg/mL DGDG, the orange line: 50 µg/mL DGDG, the purple line: 100 µg/mL in UV/VIS spectra. (b) TEM image of gold nanoparticles synthesized by caDGDG (100 µg/mL). (c) The size distribution of nanoparticles in the image of (b)

Fig. S14 The speculated schematic scheme of autoxidation reaction of glycolipids with unsaturated fatty acids in auric acid solution.

Fig. S15. The correlation between dry weight of cells and OD_{600} .

Fig. S1

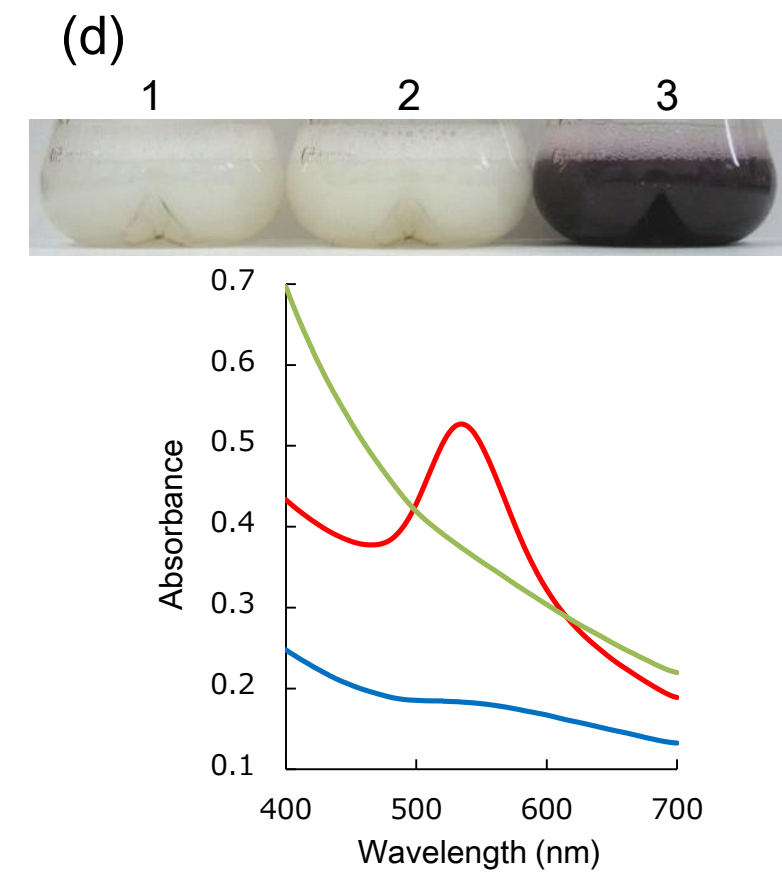
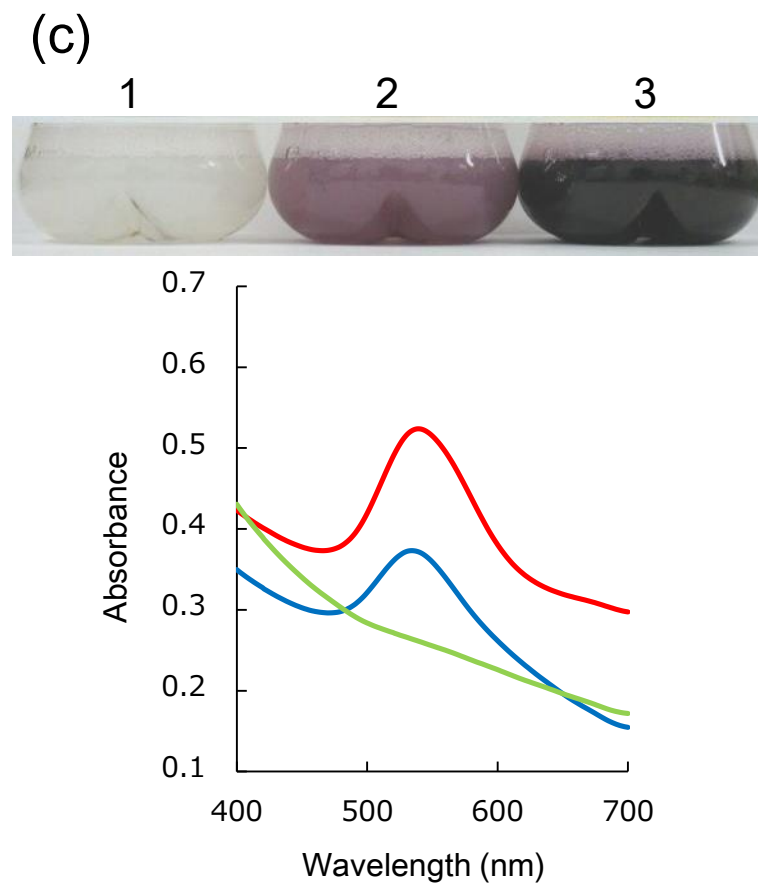
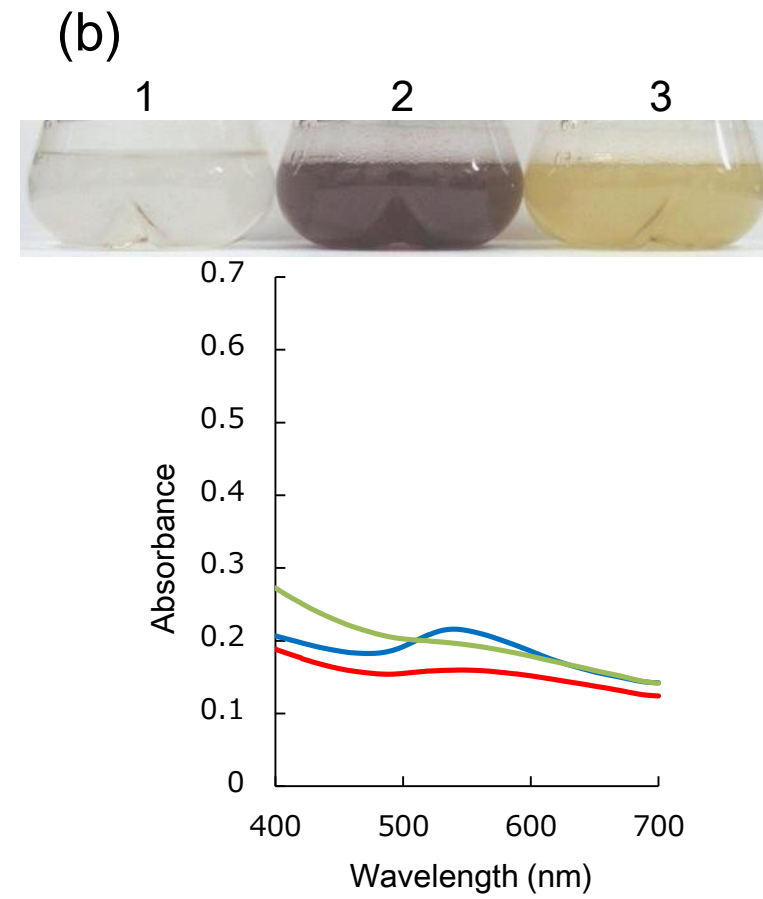
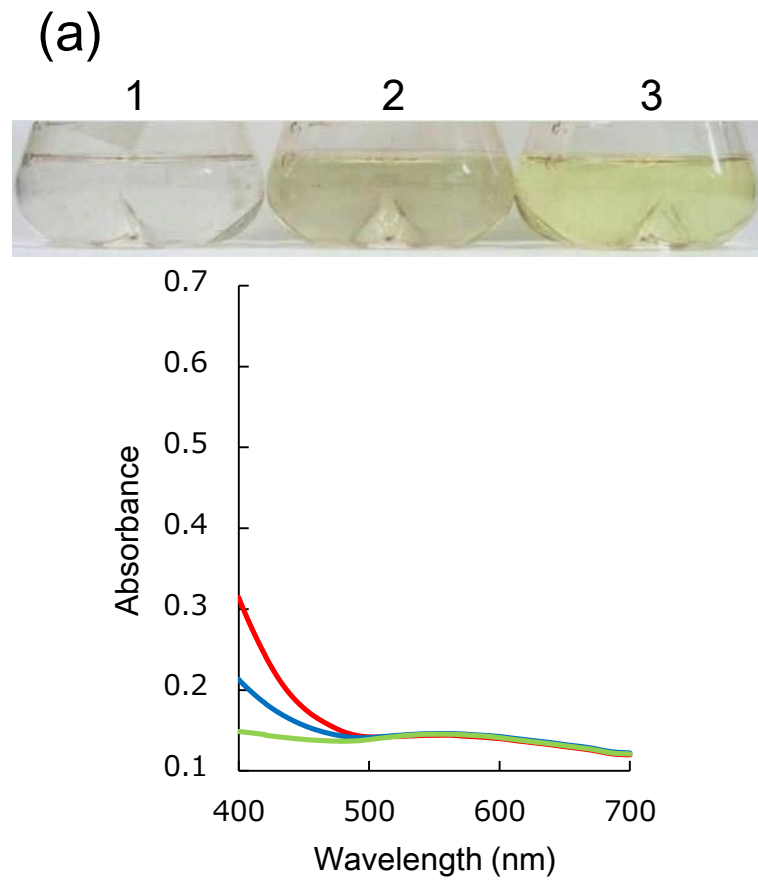
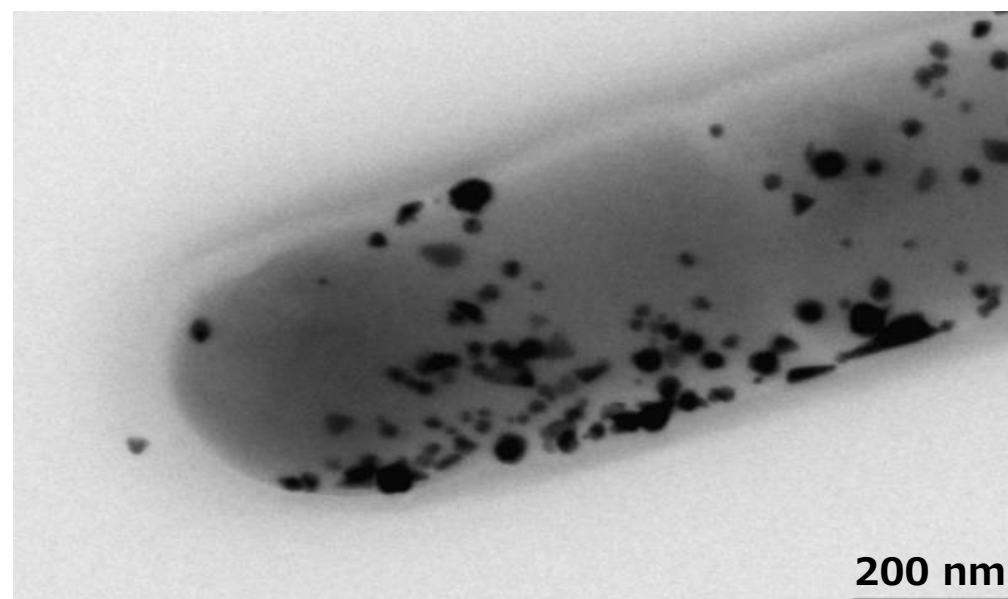


Fig. S2

(a)



(b)

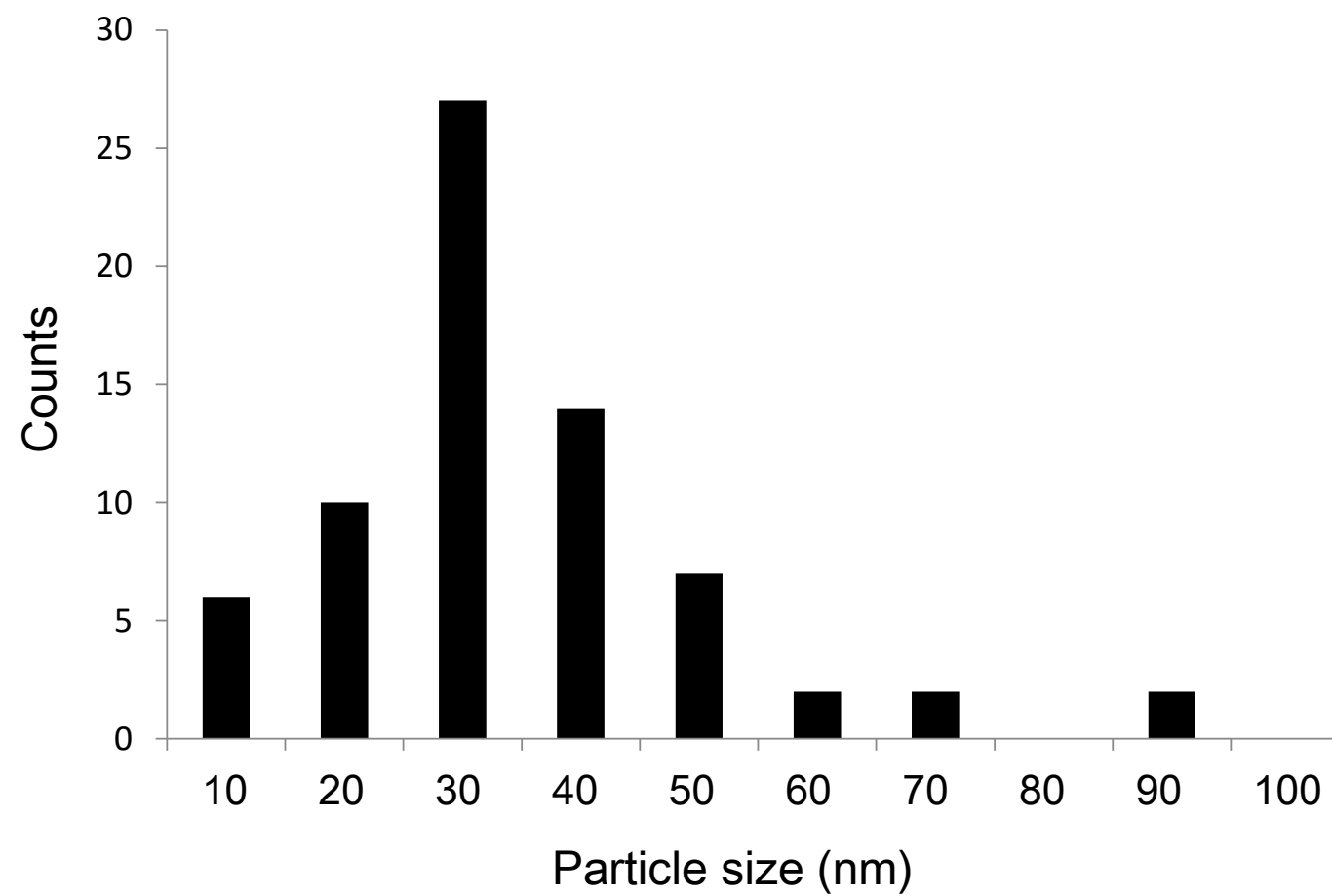


Fig. S3

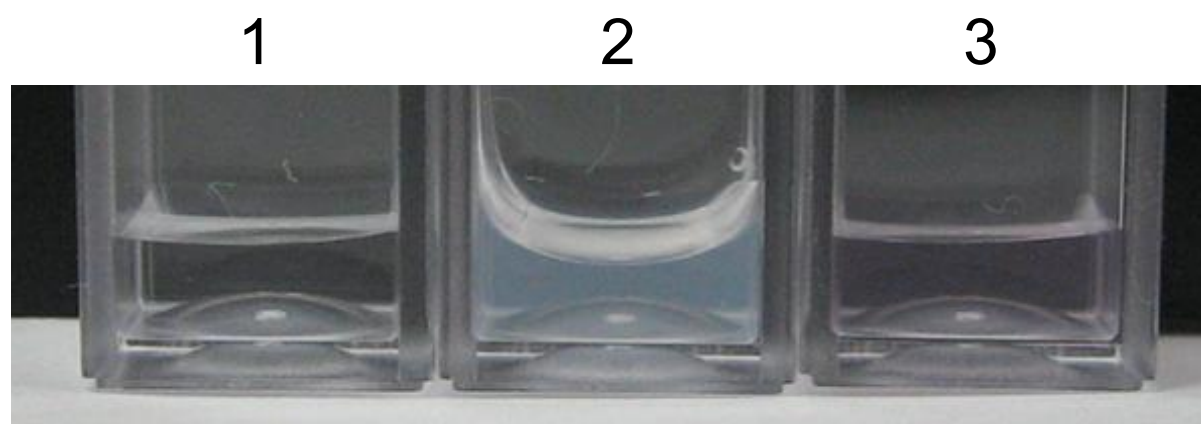


Fig. S4

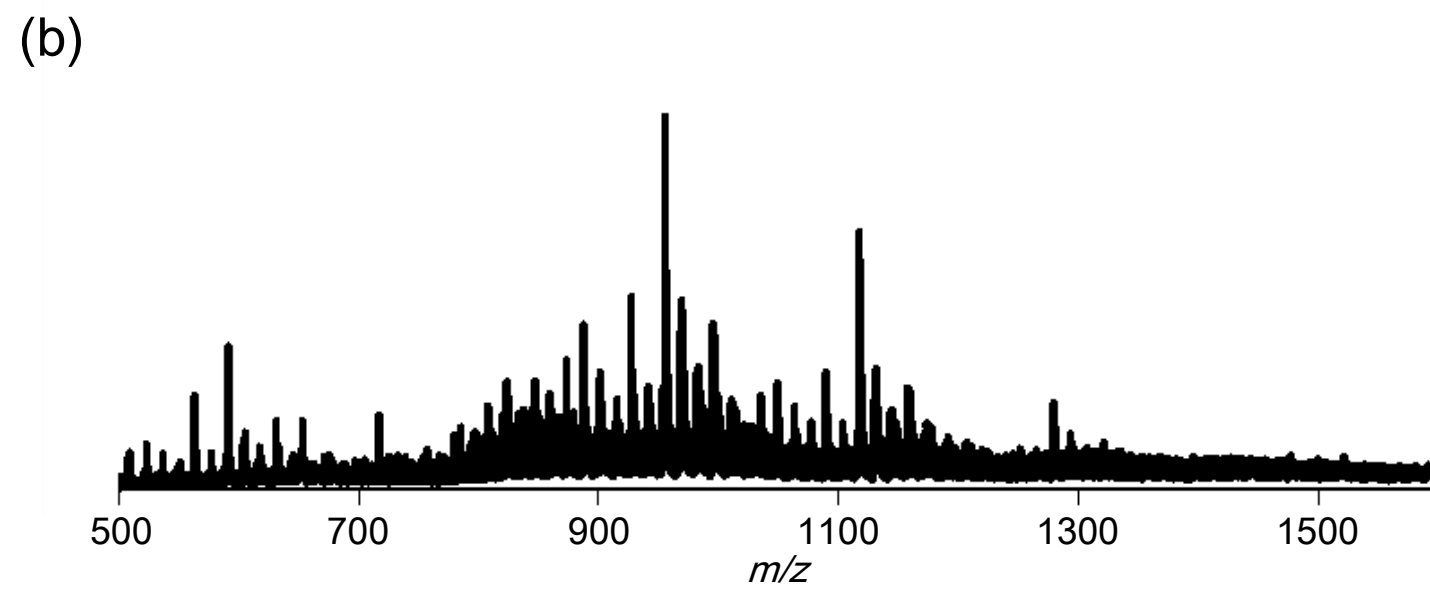
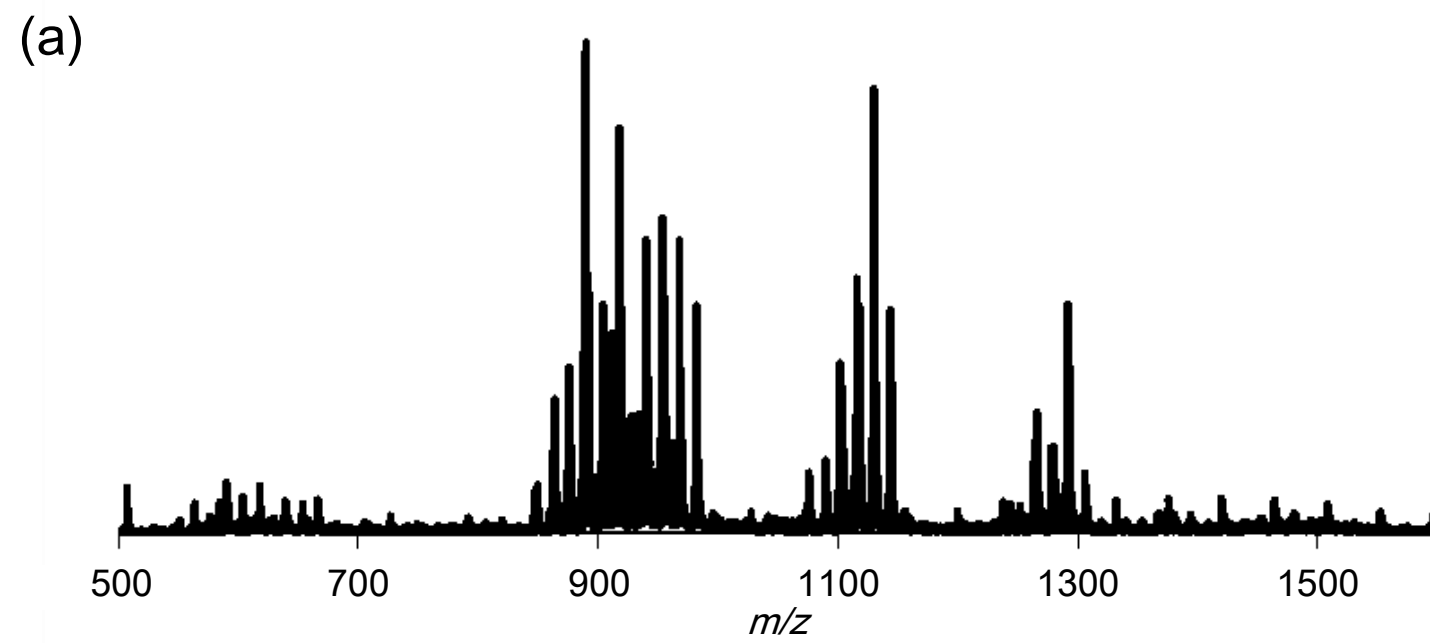


Fig. S5

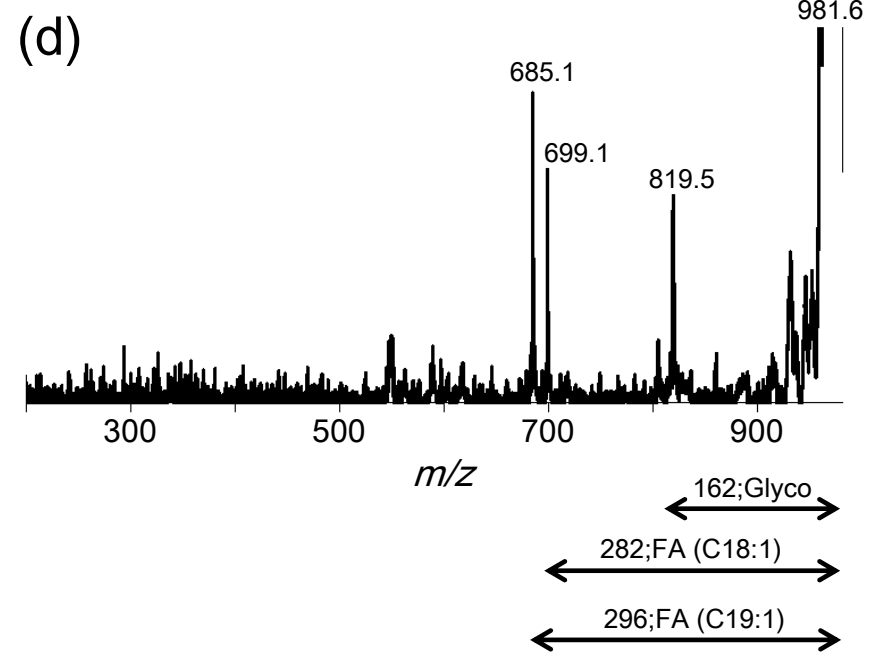
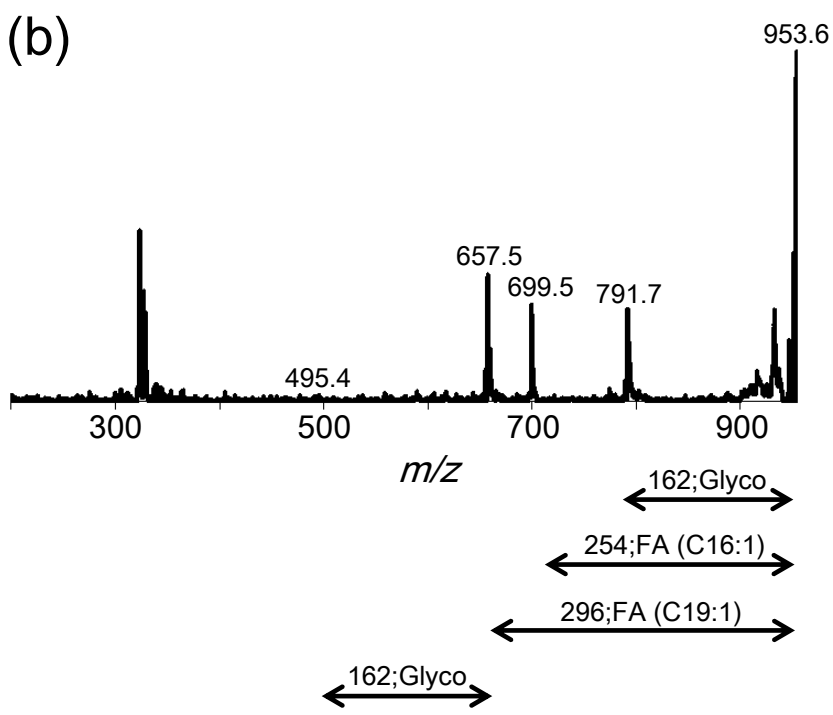
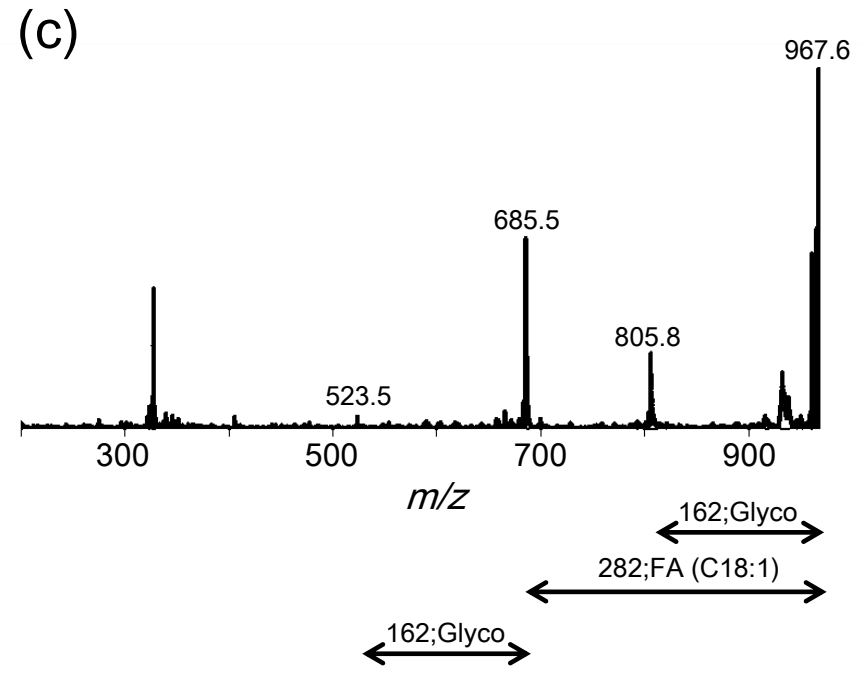
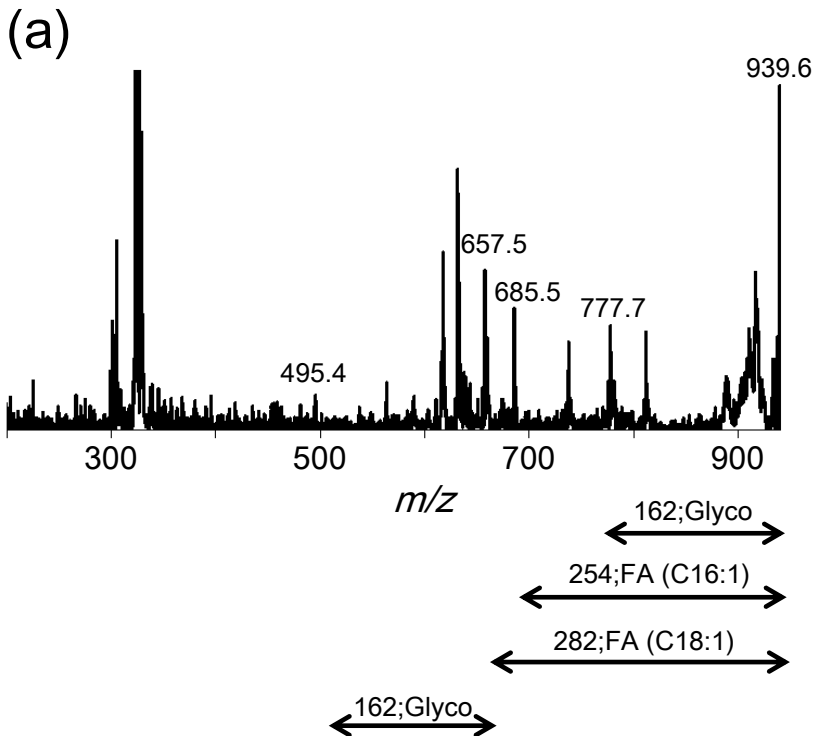


Fig. S5

(e)

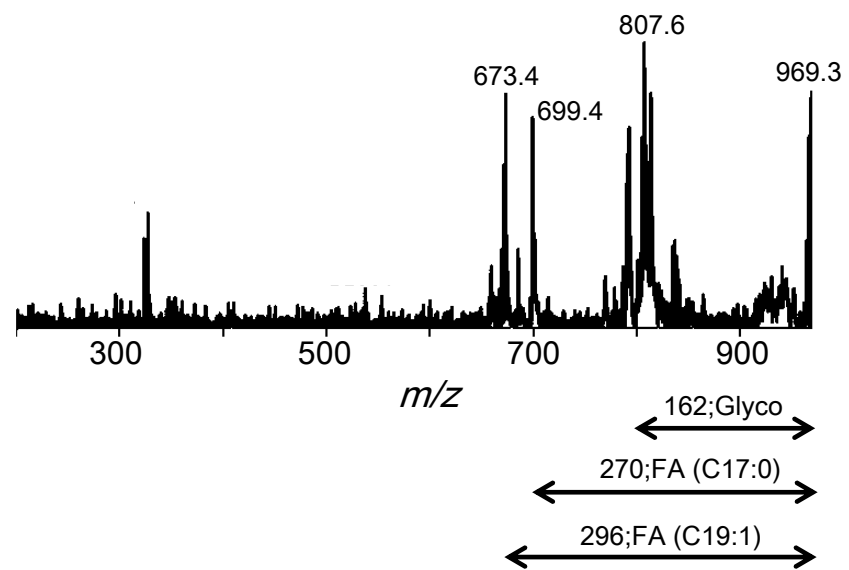


Fig. S6

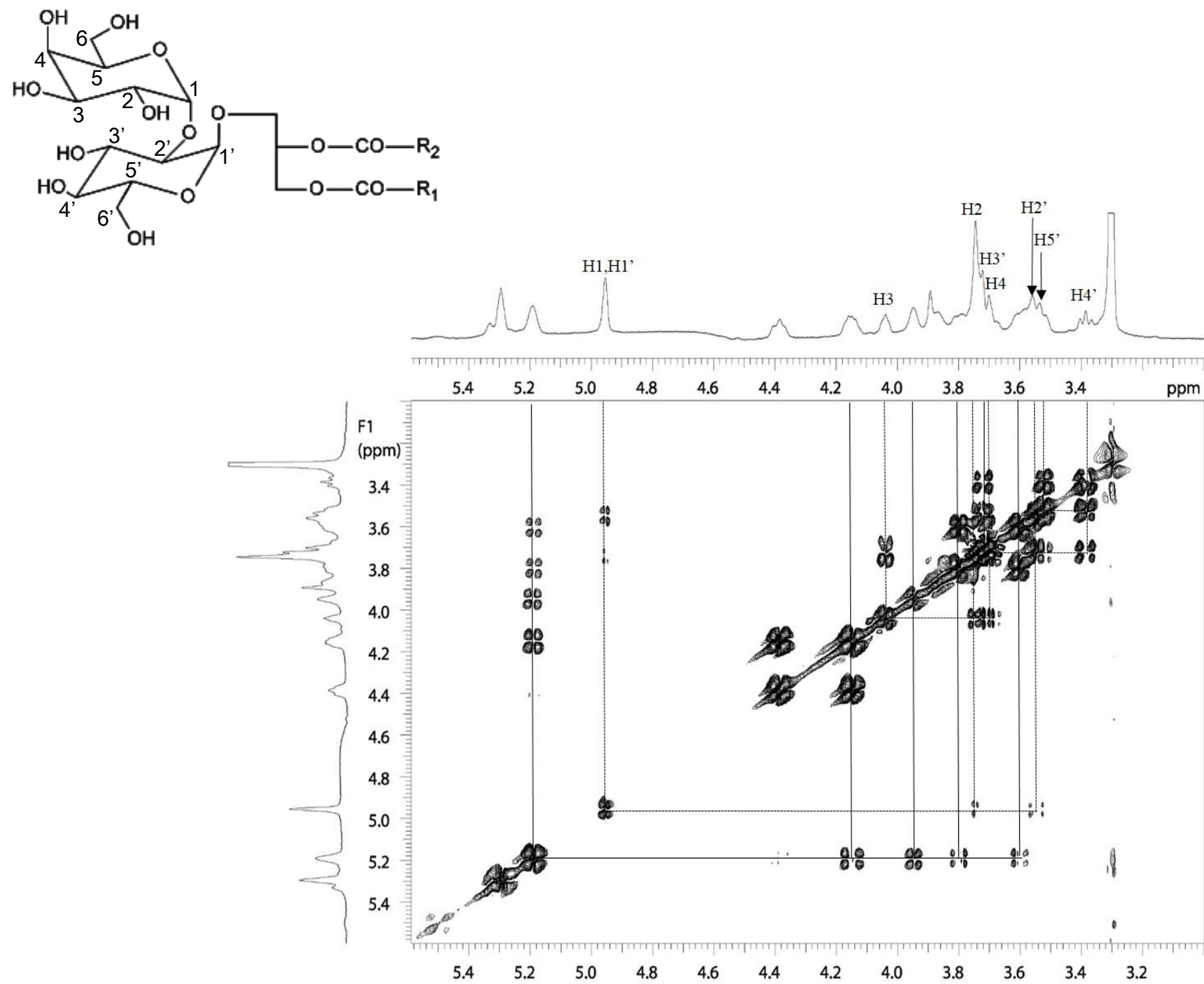


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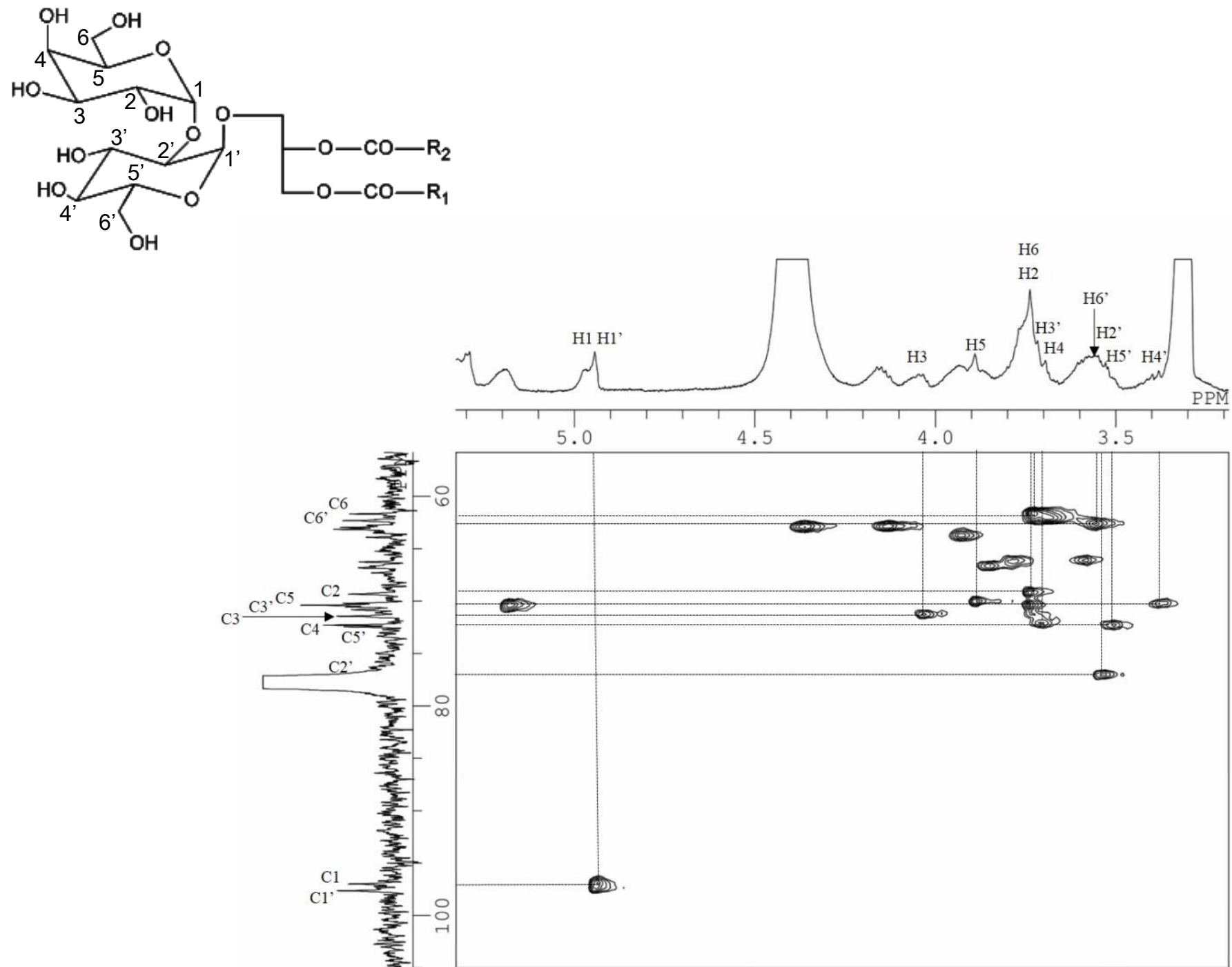


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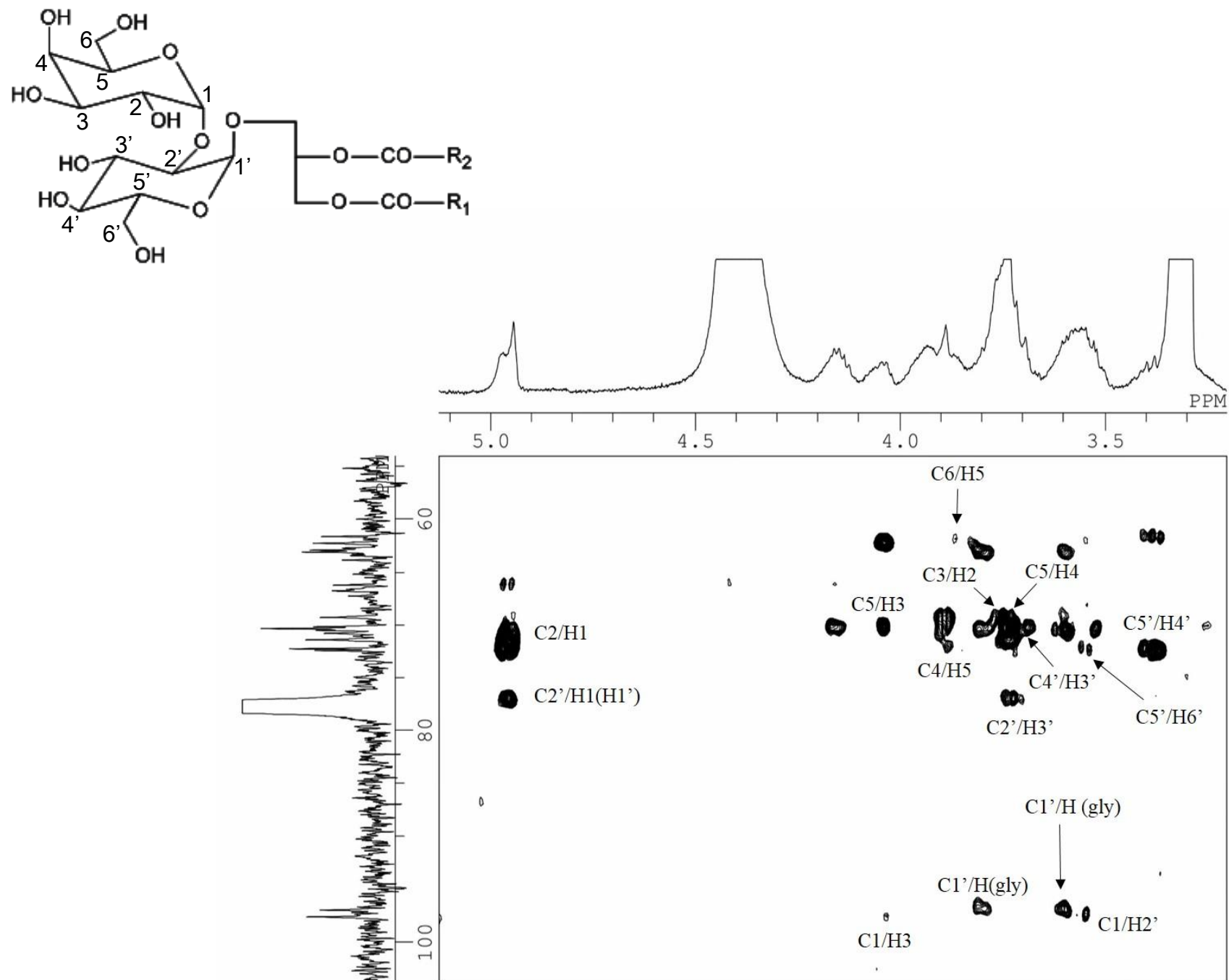


Fig. S9

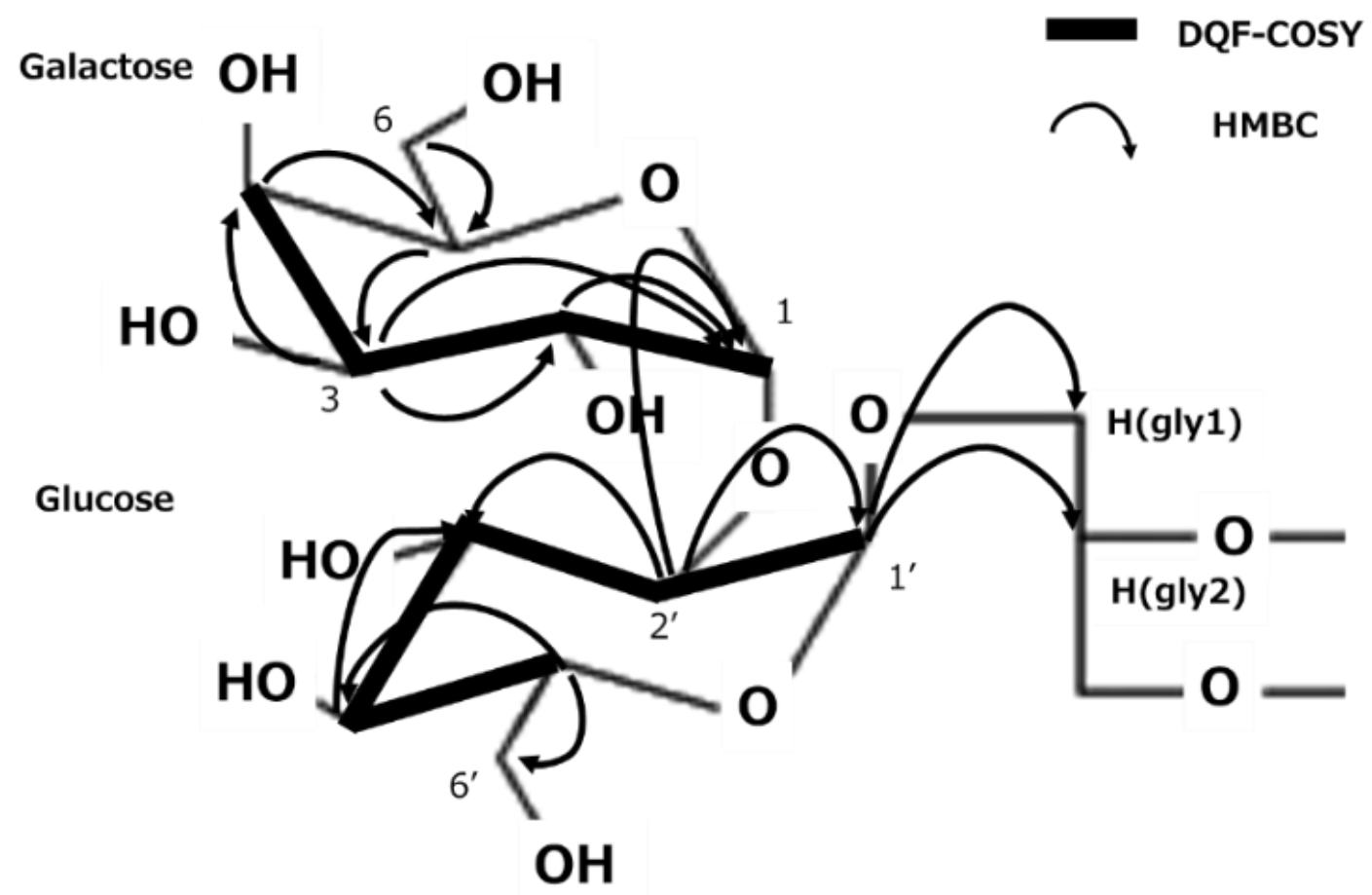


Fig. S10

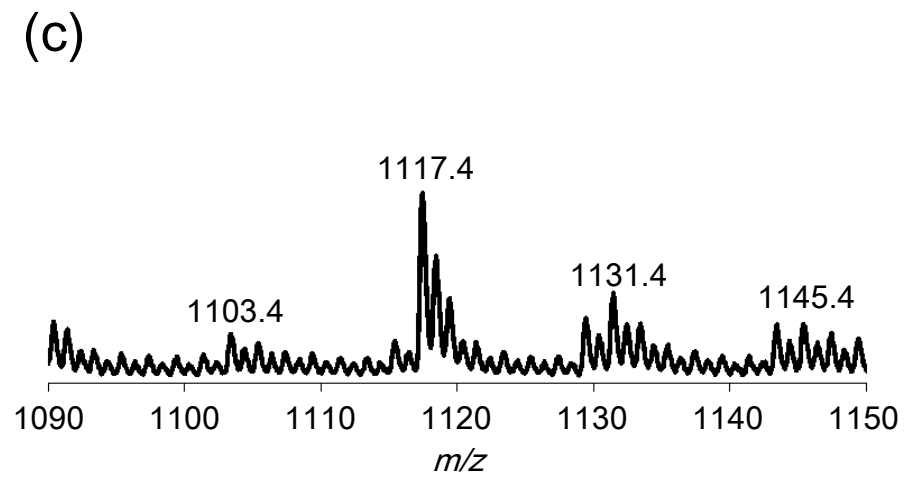
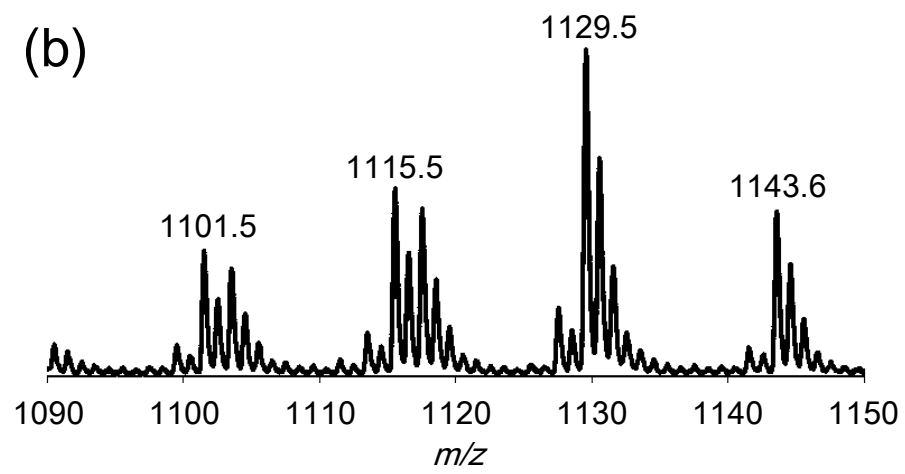
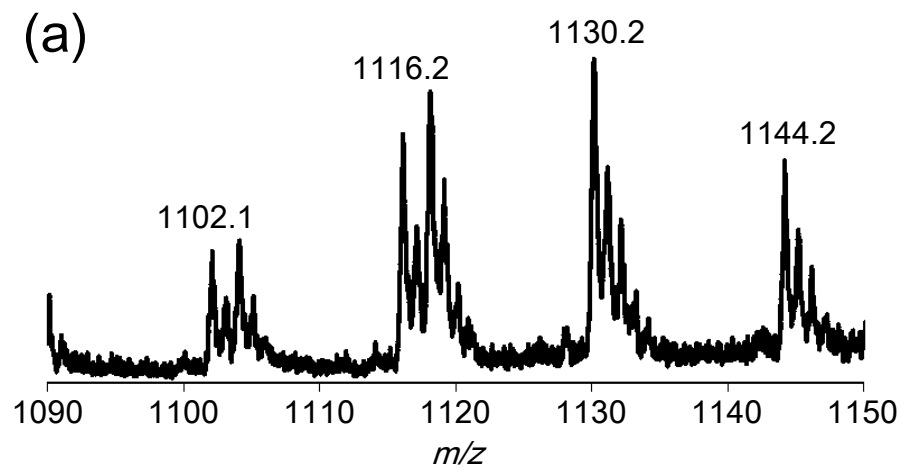


Fig. S11

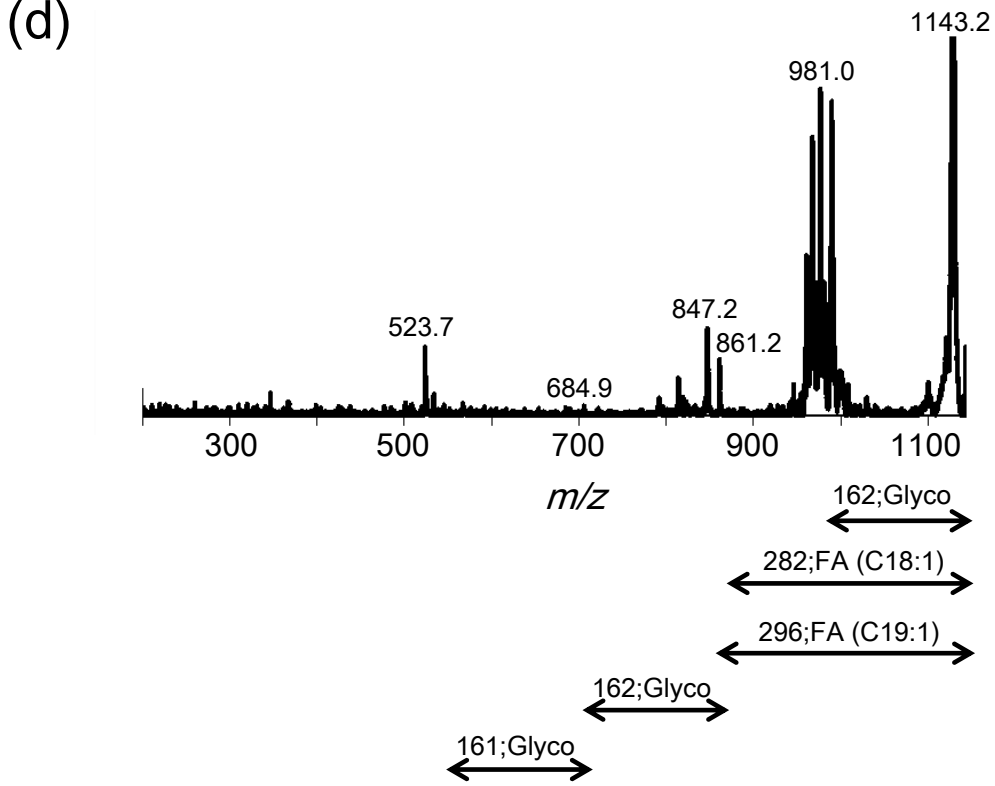
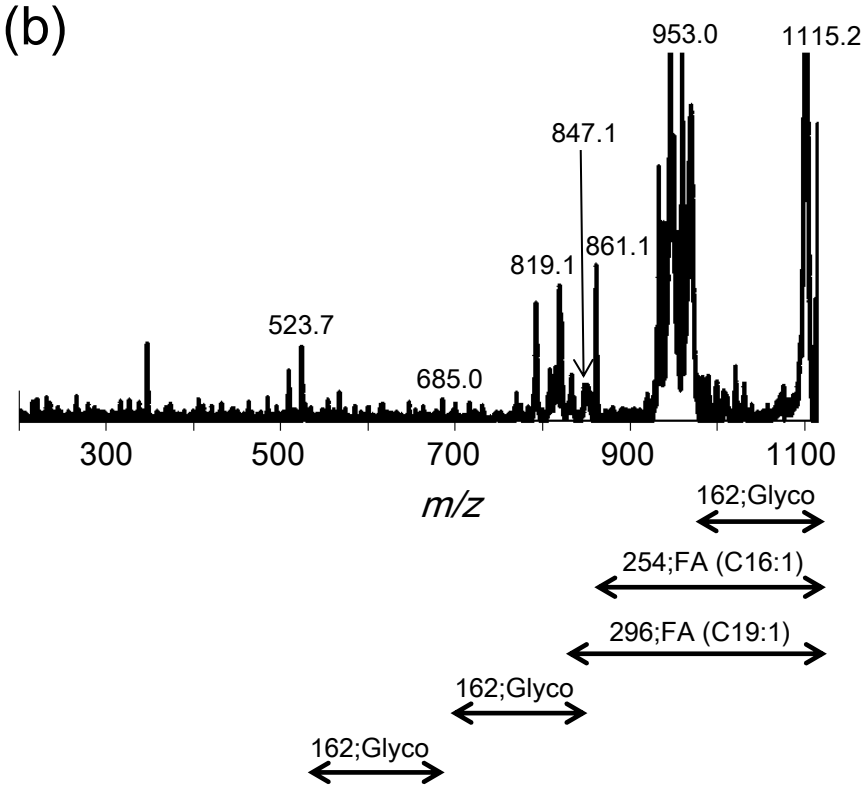
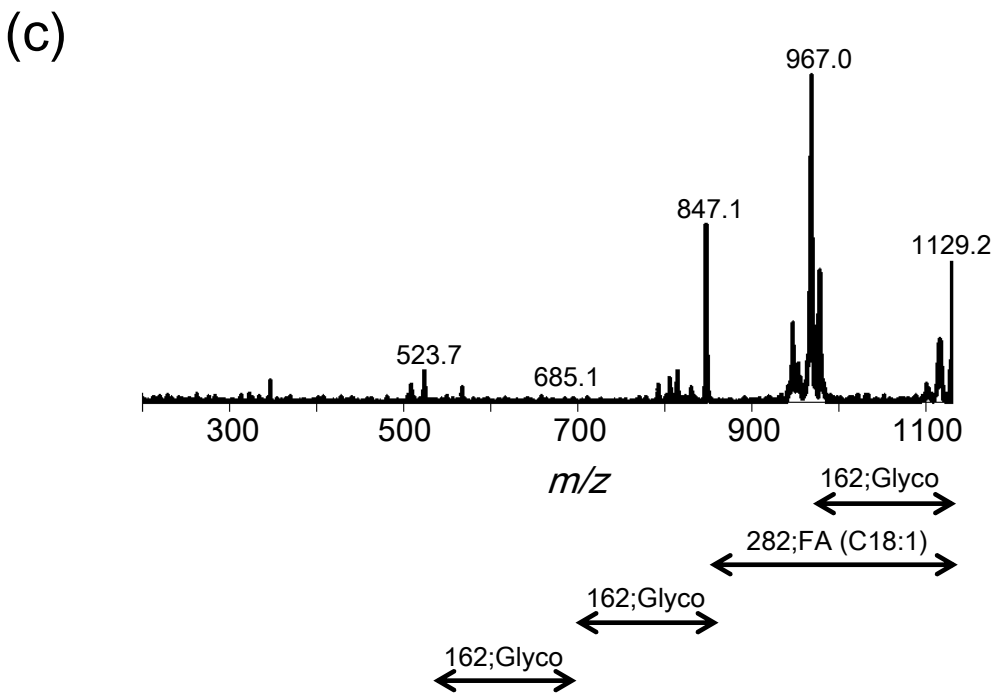
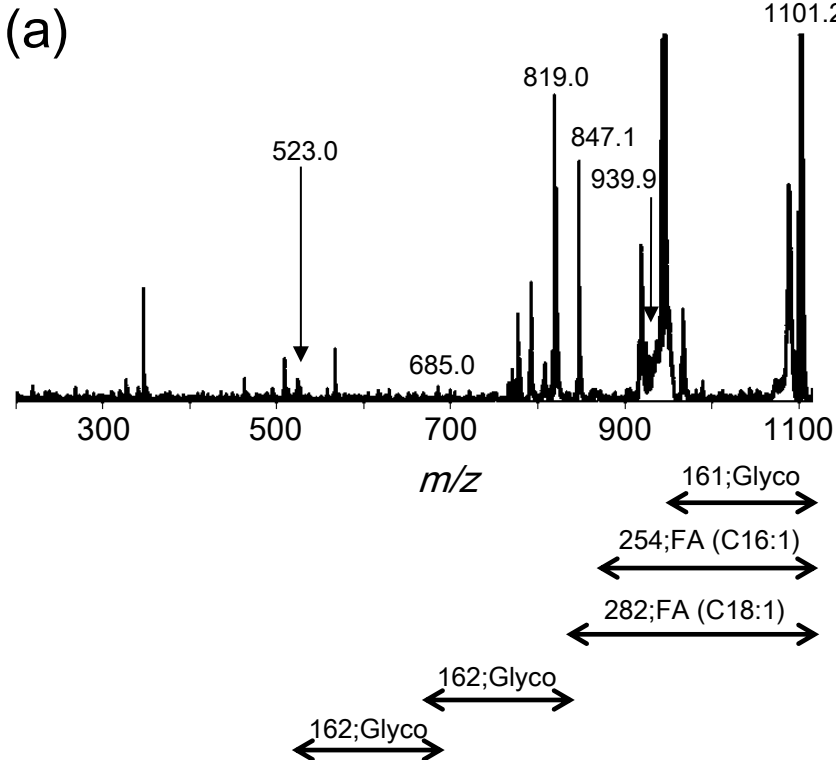
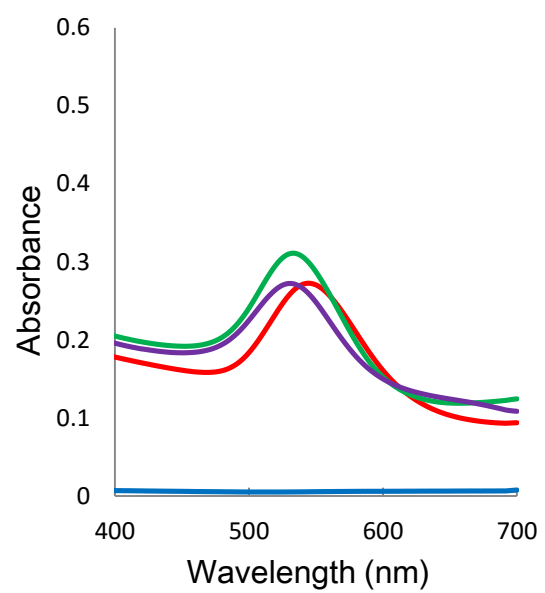
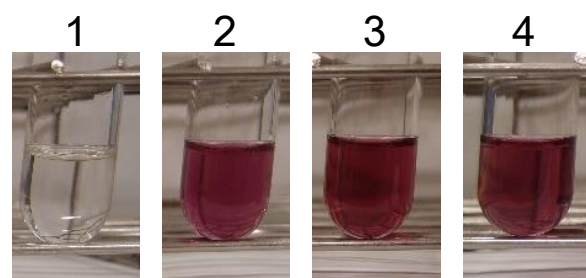


Fig. S12

(a)



(b)

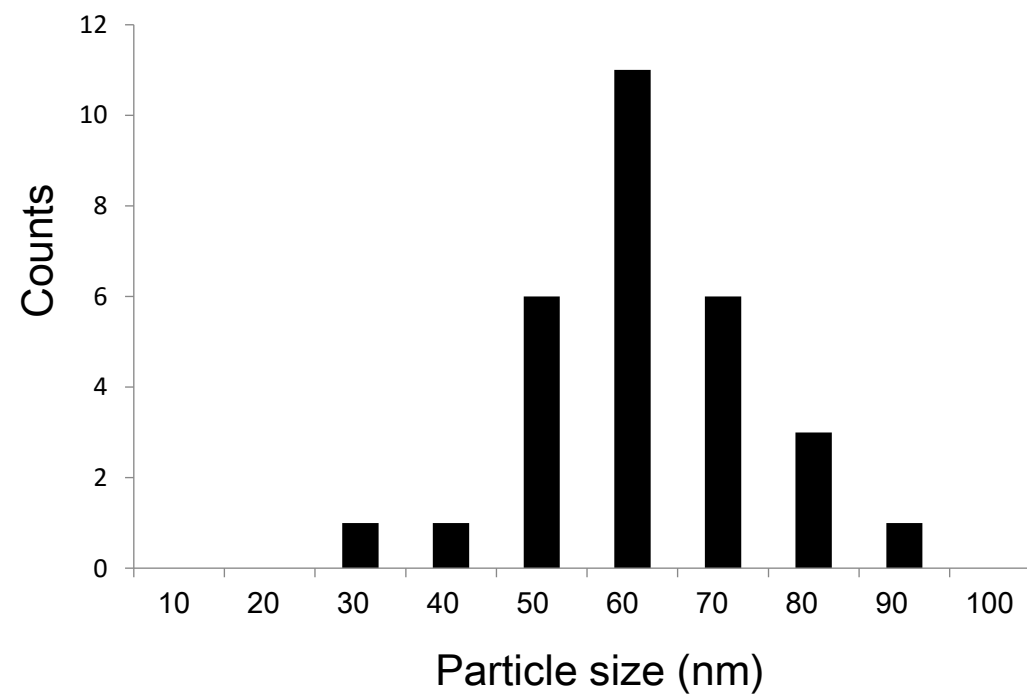
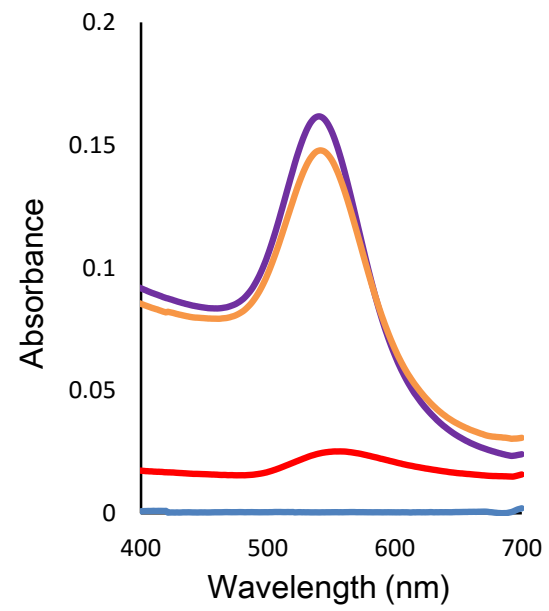
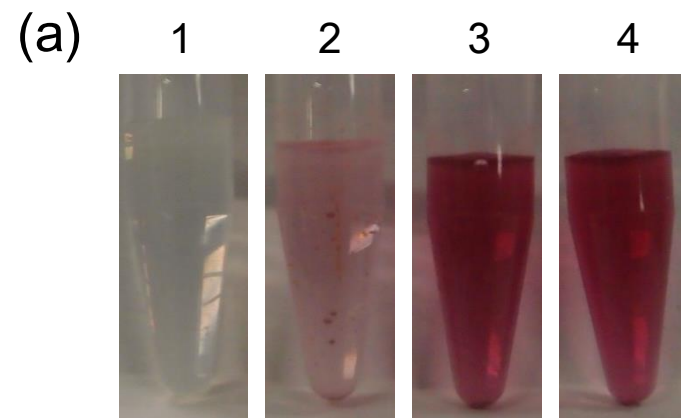
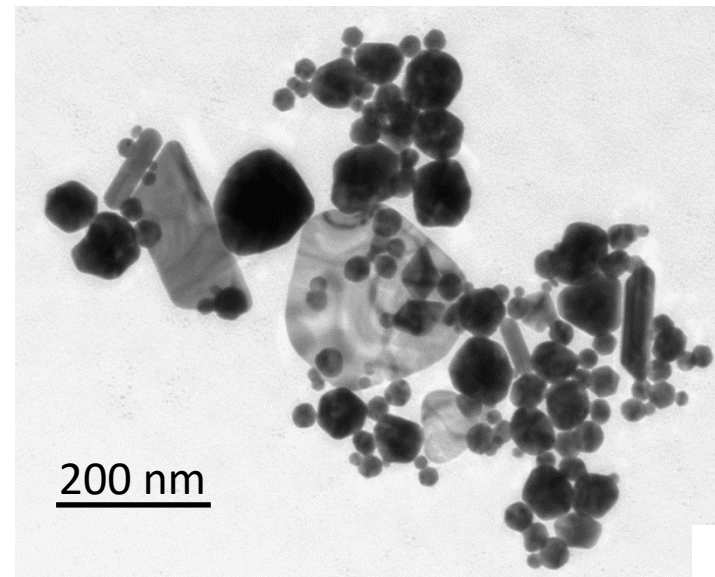


Fig. S13



(b)



(c)

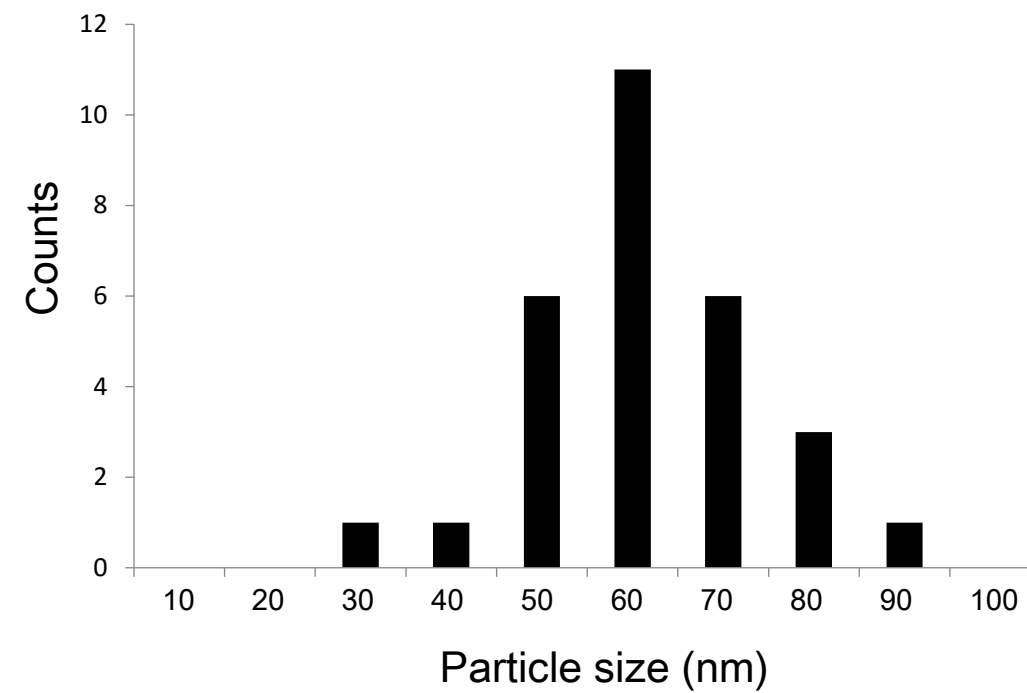


Fig. S15

