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Supporting Information

The Dynamics of Complex Formation between Amylose Brushes on Gold and Fatty Acids by QCM-D

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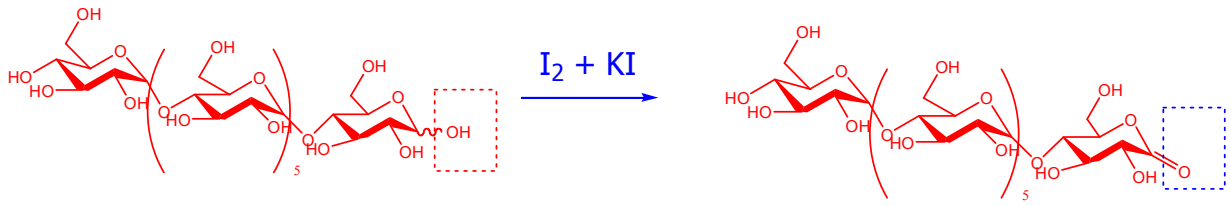
Synthesis and Characterization of Maltoheptaonolactone

The monodisperse oligosaccharide-matoheptaose was synthesized by the acid catalysized hydrolysis of β-cyclodextrin. Scheme S1 showed the formation ofs the maltoheptaonolactone via oxidation of the terminal reducing group of the maltoheptaose with I_2 and KI. Maltopentaose (2 g) was dissolved in a small amount of distilled water. Then 9.33 ml of I_2 (9.28 g) solution in methanol (70 ml) was added to the solution, and then 4% potassium hydroxide in methanol solution (32 mL) was added dropwise at 40 °C for 15 min. The mixture was poured into ice-water. Precipitated product was filtered and dissolved into distilled water (30 mL); the solution was treated with activated carbon and filtered; the filtrate was freeze-dried. The product was dissolved in distilled water, treated with Amberlite IR-120 (H+), concentrated in a rotary evaporator, and then freeze-dried.



Scheme S1 The formation of the maltoheptaonolactone via oxidation of the terminal reducing group of the maltoheptaose with I_2 and KI.

The two primers were further characterized by FT-IR spectrometer, and the spectra of the maltoheptaose and maltoheptaonolactone were shown in Figure S1. Comapred with the maltaoheptaose, maltaoheptaonolactone shows a new peak at 1742 cm^{-1} in the Figure S1, which is corresponding the characteristic vibration of the carbonyl (C=O) group in the lactone.

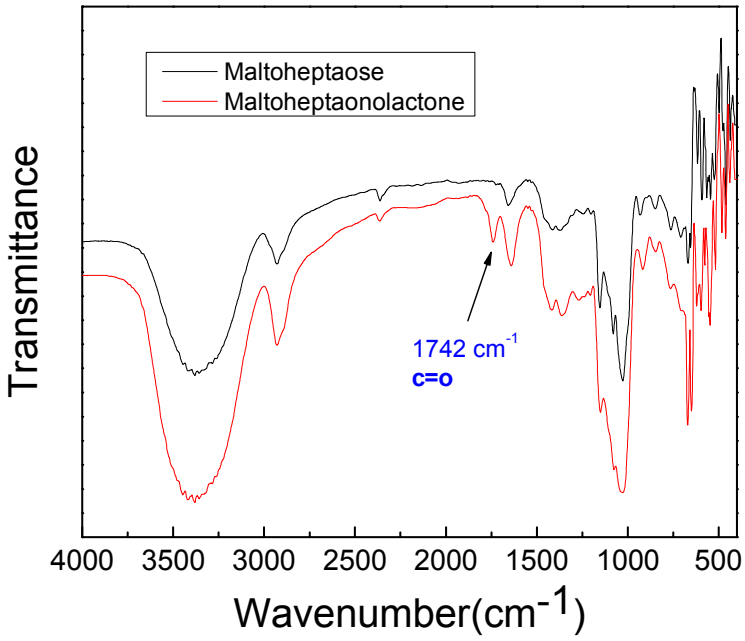


Figure S1 FT-IR spectra of the primers maltoheptaose and maltoheptaonolactone.

Figure S2 shows the ^{13}C NMR spectra of maltaoheptaose and maltaoheptaonolactone. The ^{13}C spectrum of maltoheptaose shows one characteristic signal at about 96 ppm because of the terminal reducing group C-OH. After the oxidation reaction, the peak of maltoheptaose at about 96 ppm disappreared. However, the ^{13}C spectrum of maltoheptonolactone shows a new peak at 176 ppm, which is assigned to the signal of the terminal group C=O.

Both FT-IR measurements and ^{13}C NMR spectra confirmed the maltoheptaonolacone has been successfully synthesized, which can be further attached to the amino functionalized surfaces.

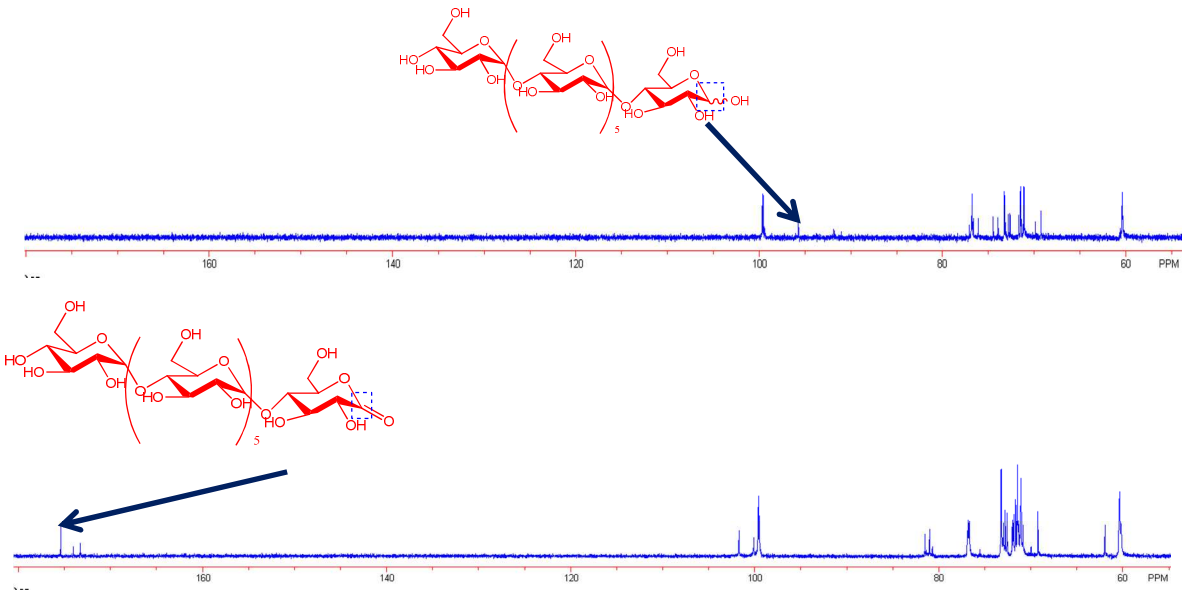


Figure S2 ^{13} C NMR spectra of Maltoheptaonolactone and Maltoheptaose (measured in D_2O).