Supporting Information

Multidentate Zwitterionic Chitosan Oligosaccharide Modified Gold Nanoparticles: Stability, Biocompatibility and Cell Interactions

Xiangsheng Liu, Haoyuan Huang, Gongyan Liu, Wenbo Zhou, Yangjun Chen, Qiao Jin and Jian Ji*

Fig. S1 $^1$H-NMR spectrum of LA-CSO-PC.

Fig. S2 FT-IR spectrum of AuNP-LA-CSO-PC.
**Synthesis of 16 nm Citrate-capped AuNPs**

Citrate-capped AuNPs in diameter of ca. 16 nm was prepared following a standard route.1 Briefly, in a 100 mL round-bottom flask equipped with a condenser, 45 mL Milli-Q water with HAuCl4 (1 mM) was heated to boil under stirring. After boiling, rapid addition of sodium citrate (38.8 mM, 5.8 mL) to the boiling solution with vigorous stirring resulted in a color change from pale yellow to burgundy. Boiling was continued for 10 min; the heating mantle was then removed, and stirring was continued for additional 15 min.

**Synthesis of CTAB-capped AuNRs**

The synthesis of AuNRs was referred to the methods by Murphy et al.2 and El-Sayed3. Firstly, the gold seeds were prepared by adding 0.6 mL ice solution of 10 mM NaBH4 into 10 mL solution of 100 mM CTAB and 0.25 mM HAuCl4, which resulted in the formation of a brownish yellow solution. Vigorous stirring of the seed solution was continued for 2 min. After the solution was stirred, it was kept at 27 °C for 2-6 h before used for AuNR growth. The growth solution was prepared by added 0.35 mL 78.8 mM Ascorbic acid (AA) to 50 mL solution of 100 mM CTAB, 0.5 mM HAuCl4 and 0.1 mM AgNO3, which resulted in a colorless solution. Then 1.5 ml of the aged seeds solution was added to the growth solution. The mixed solution was shaken for 4-6 min, and then kept still overnight at 27 °C to finally generate CTAB capped AuNRs.