Supporting Information

Insights for realizing ultrasensitive colorimetric detection of glucose based on carbon/silver core/shell nanodots

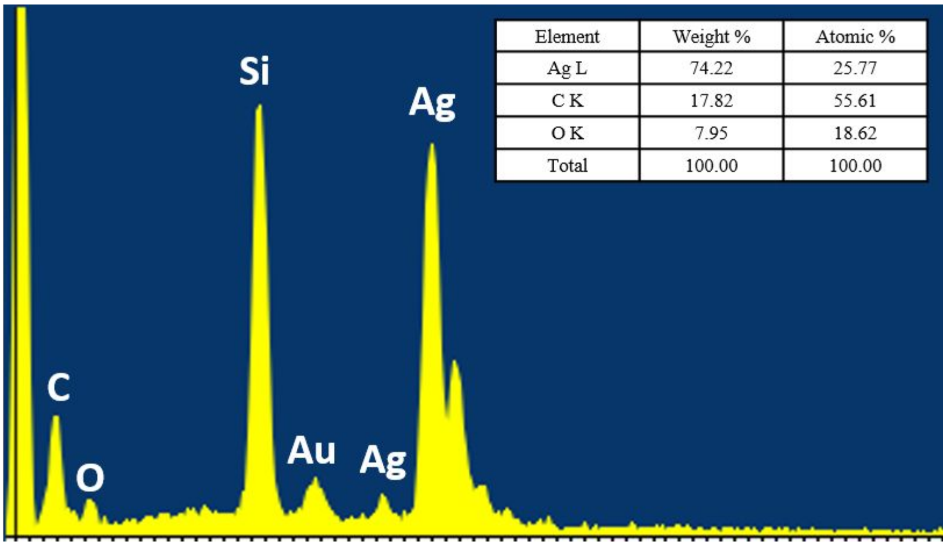
Po-Hsuan Hsiao,[1] Chia-Yun Chen[1,2]*

[1] Department of Materials Science and Engineering, National Cheng Kung University, Tainan 70101, Taiwan

[2] Hierarchical Green-Energy Materials (Hi-GEM) Research Center, National Cheng Kung University, Tainan 70101, Taiwan

*E-mail: timcychen@mail.ncku.edu.tw

S-1 Elemental composition analysis of core/shell nanodots



Element	Weight %	Atomic %
Ag L	74.22	25.77
C K	17.82	55.61
O K	7.95	18.62
Total	100.00	100.00

Figure S1. EDS analysis of C/Ag core/shell nanodots. The quantitative analysis was shown in the inserted figure.

S-2 Sensing process based on the designed core/shell nanostructures.

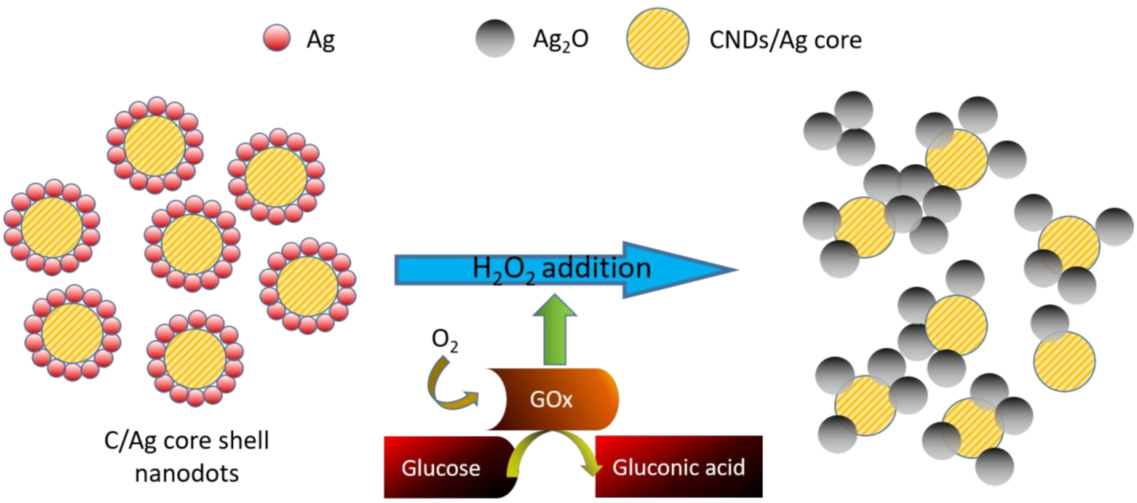


Figure S2. Illustration of sensing glucose based on colorimetric detection using C/Ag core/shell nanodots.

S-3 Possible reaction of H_2O_2 generation with GO_x mediation

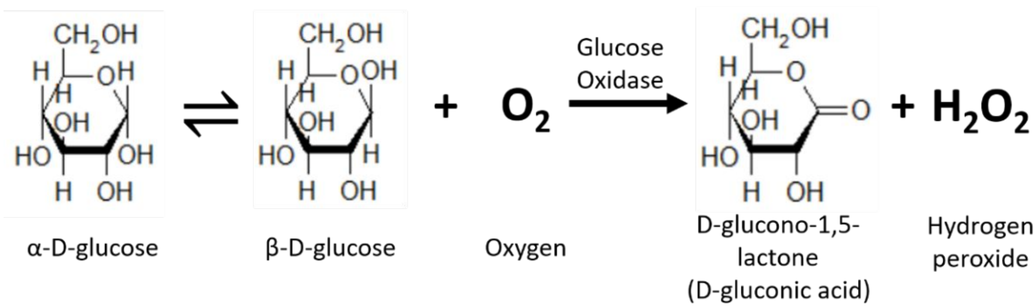


Figure S3. Possible instant reaction of glucose catalyzed with the glucose oxidase. Accordingly, H_2O_2 molecules were generated and initiated the color change of C/Ag core/shell indicators.

S-4 Reliability examination of glucose sensors based on core/shell nanodots

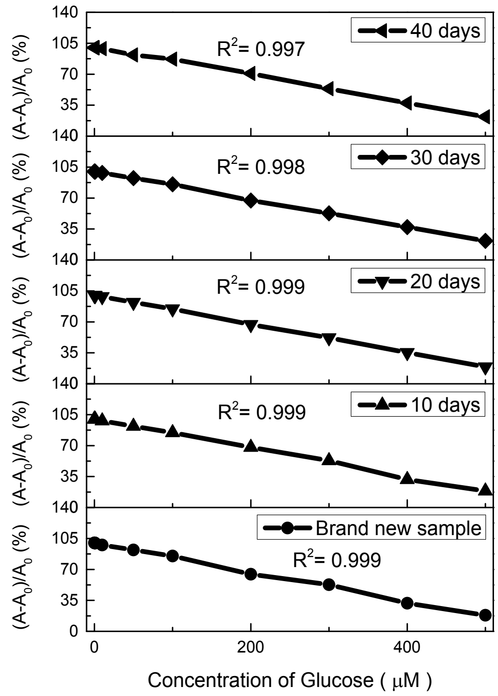


Figure S4. The duration test (0-40 days) of C/Ag core/shell nanodots under various concentrations of glucose.

S-5 Analysis of particle size

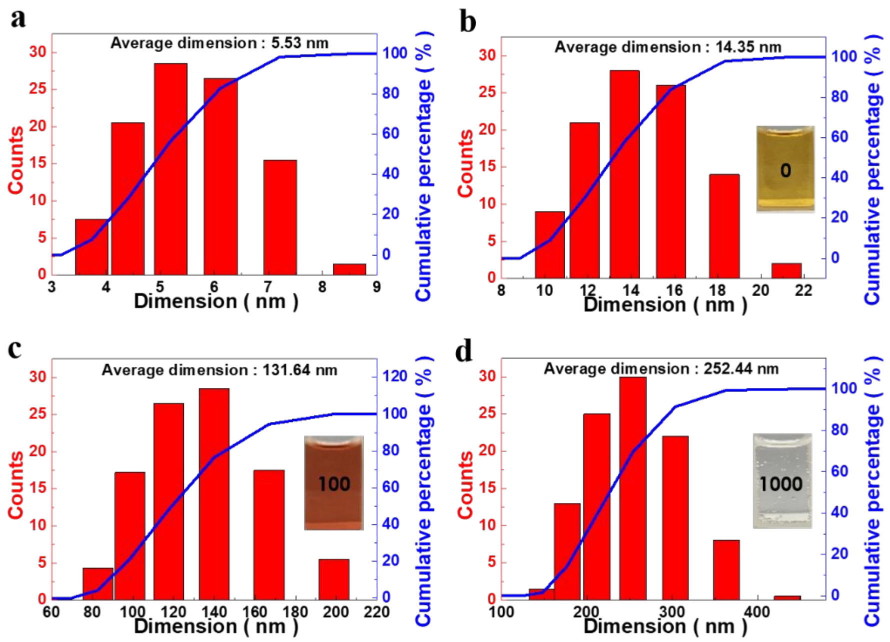


Figure S5. DLS measured results of (a) CNDs, (b) C/Ag core/shell nanodots without and with (c)100 μM and (d)1000 μM of H_2O_2 addition.

S-6 TEM investigations of C/Ag core/shell nanodots with H_2O_2 addition

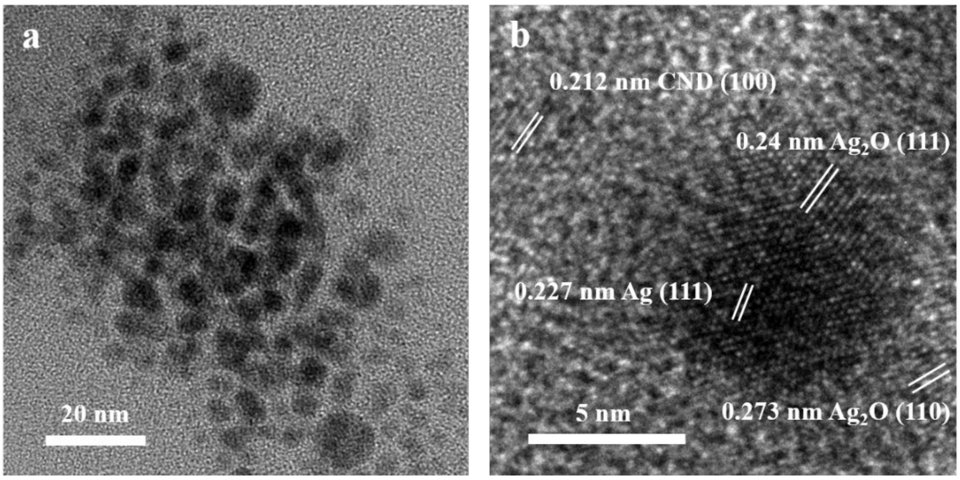


Figure S6. (a) Representative TEM and (b) HRTEM images of C/Ag core/shell nanodots with 1000 μM of H_2O_2 addition.

S-7 Crystallographic characterizations of samples with and without H_2O_2 additions

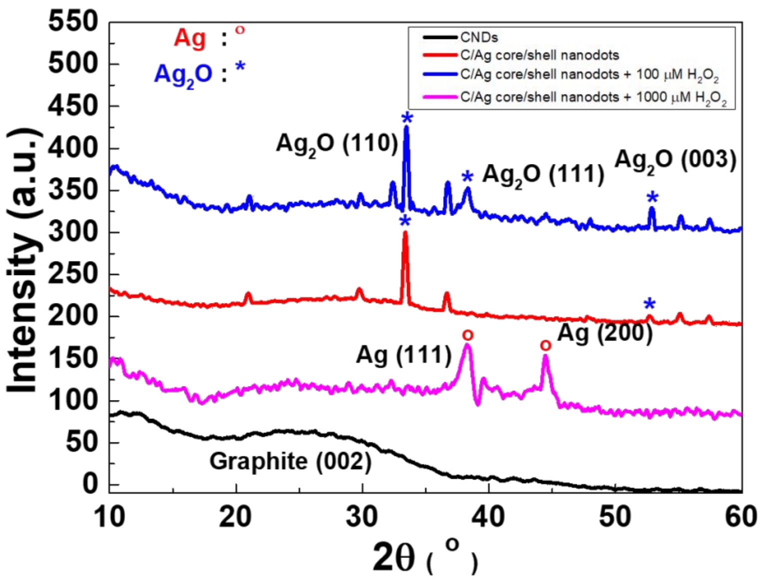


Figure S7. XRD patterns of CNDs, C/Ag core/shell nanodots without and with 100 and 1000 μM of H_2O_2 addition.

S-8 Examinations of optimal condition for preparing C/Ag core/shell nanostructures

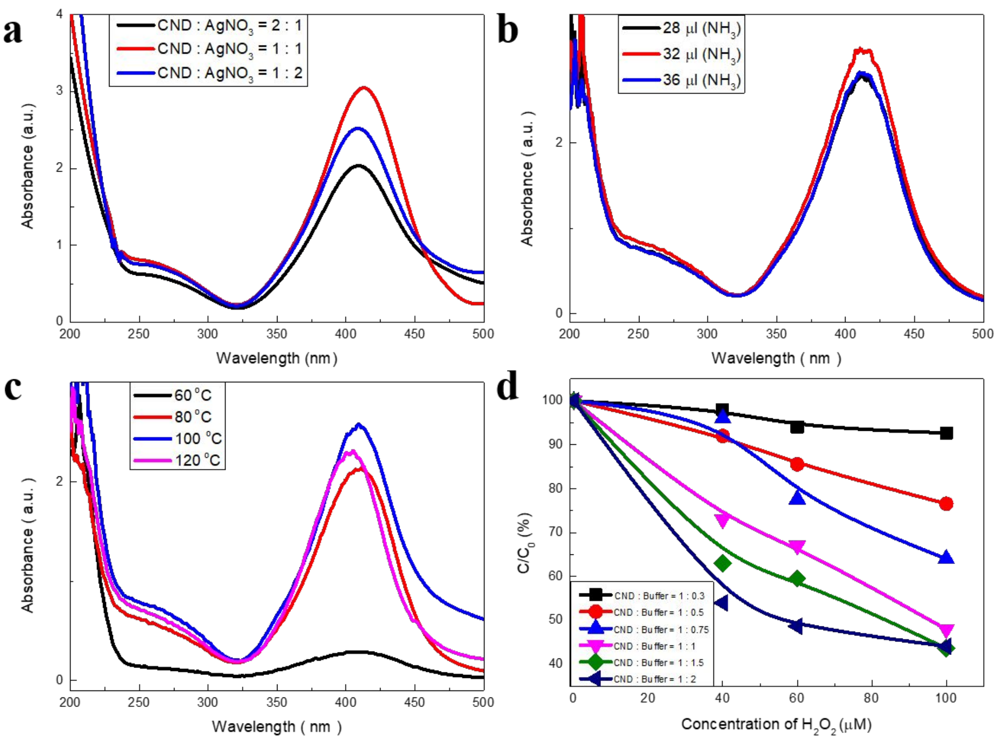


Figure S8. Examinations of optimal condition for the preparation of C/Ag core/shell nanostructures. (a)The ratio of CND to $AgNO_3$ reagents, (b) the amount of the NH_3 used in preparation, (c) the temperature of thermal treatment and (d) the addition of BF buffer solutions. The results displayed that the optimal condition for preparing C/Ag core-shell nanodots were, CND:$AgNO_3$ = 1:1, 32 μL of NH_3 and 100^0C for thermal treatment. The ratio of C/Ag core-shell nanodots : BF buffer solution = 1:1 was found to be optimal due to the straight correlation line. (R_2 = 0.997).