Electronic Supplementary Information for

Controllable synthesis of monodisperse gold nanorod with a small diameter of around 10 nm and a largest plasmon wavelength of 1200 nm

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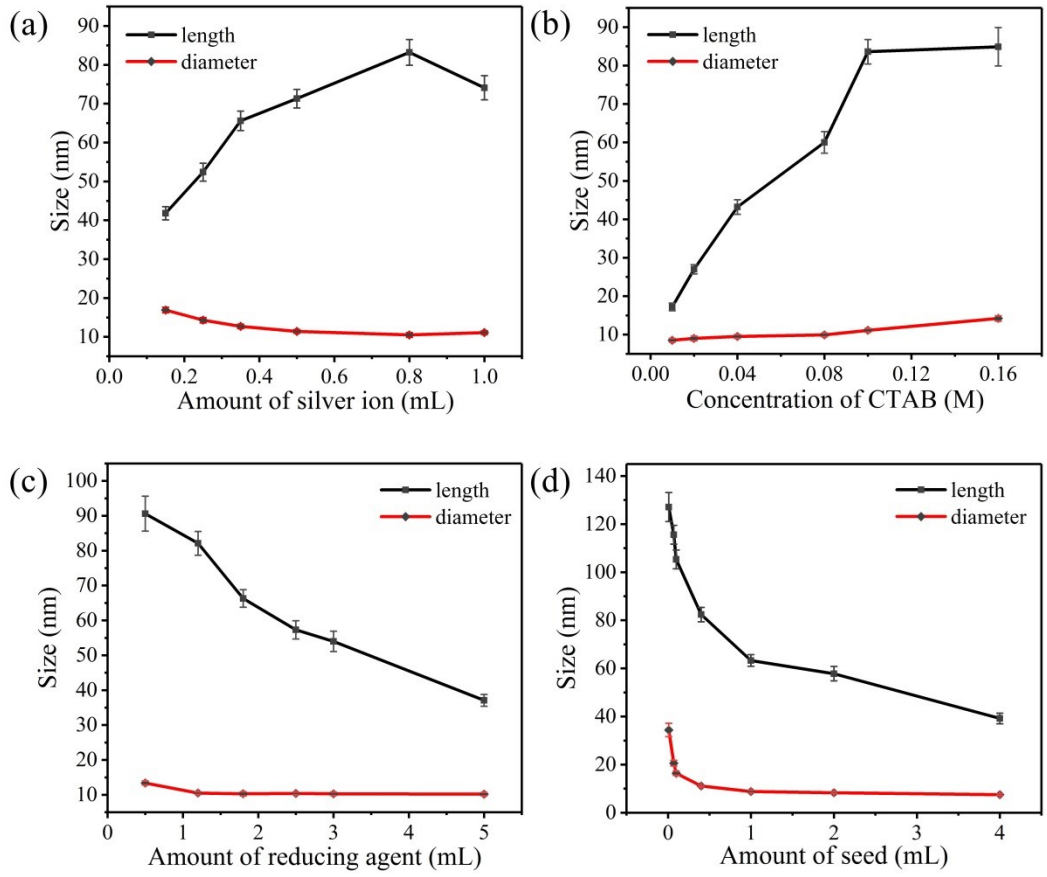

Fig. S1 Variations of size of AuNR as a function of different amount of (a) silver ion, (b) CTAB, (c) reducing agent, and (d) gold seed.

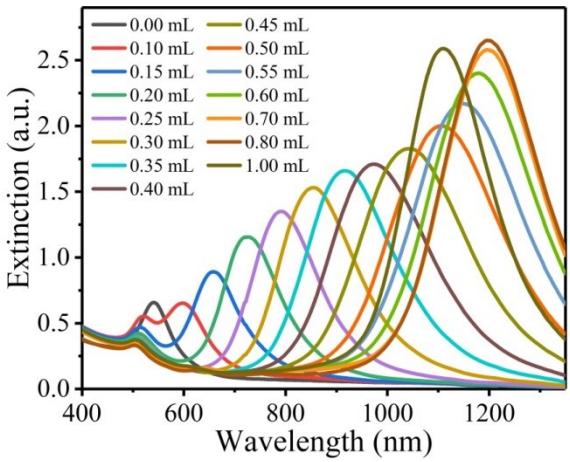

Fig. S2 Extinction spectra of AuNR prepared by increasing silver ion from 0.0 mL to 1.0 mL.

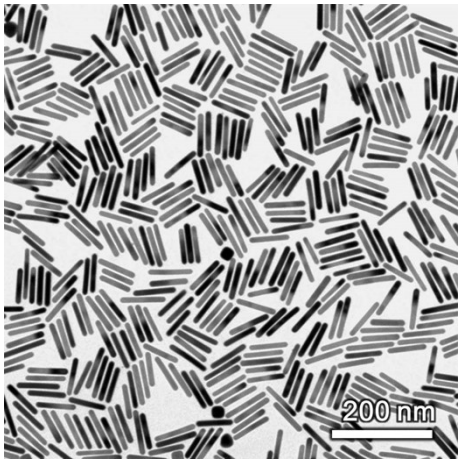

Fig. S3 TEM image of AuNR prepared by 0.8 mL of silver ion.

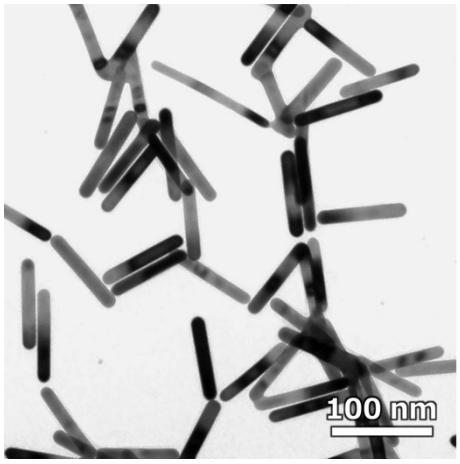

Fig. S4 TEM image of AuNR prepared by 1.0 mL silver ion.

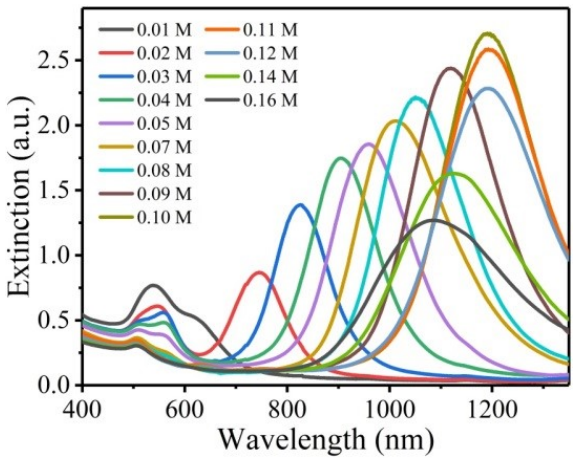

Fig. S5 Extinction spectra of AuNR prepared by increasing CTAB from 0.01 M to 0.16 M.

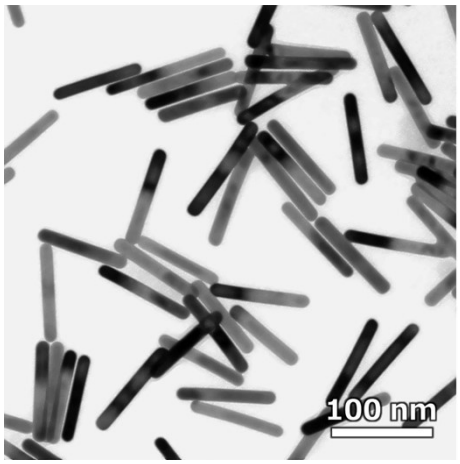

Fig. S6 TEM image of AuNR prepared by 0.10 M CTAB.

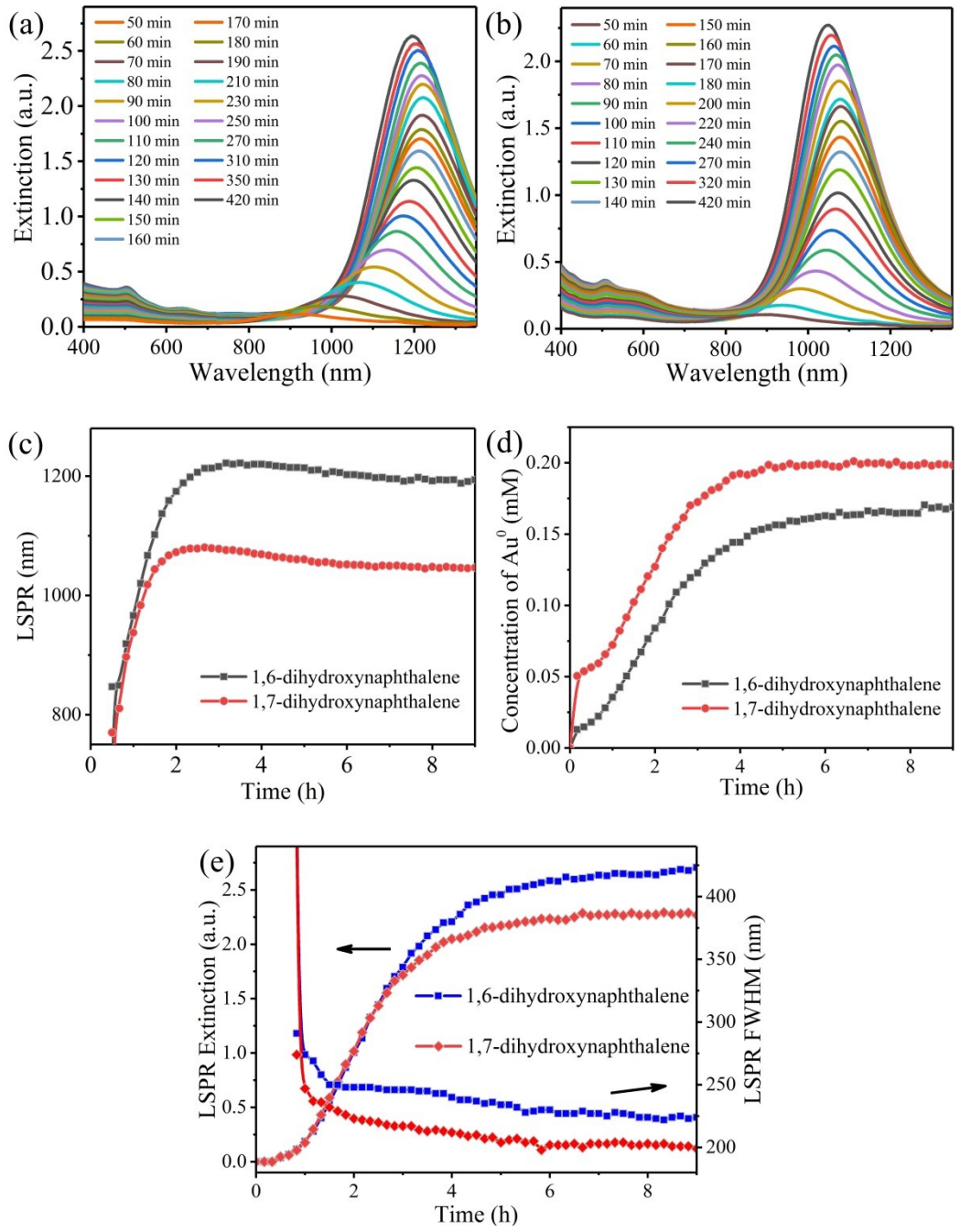

Fig. S7 Kinetic UV−vis-NIR monitoring of AuNR synthesis by 1,6-dihydroxynaphthalene and 1,7-dihydroxynaphthalene. (a) Kinetic UV−vis-NIR spectra of AuNR synthesis by 1,6-dihydroxynaphthalene taken at 10 min intervals. (b) Kinetic UV−vis spectra of AuNR synthesis by 1,7-dihydroxynaphthalene taken at 10 min intervals. (c) LSPR wavelength of AuNR as a function of time. (d) Variation of concentration of Au^0 calculated from $Abs_{400\ nm}$ as a function of growth time for two methods; (e) Measured extinction intensity and FWHM of the LSPR peak versus growth time for two methods.

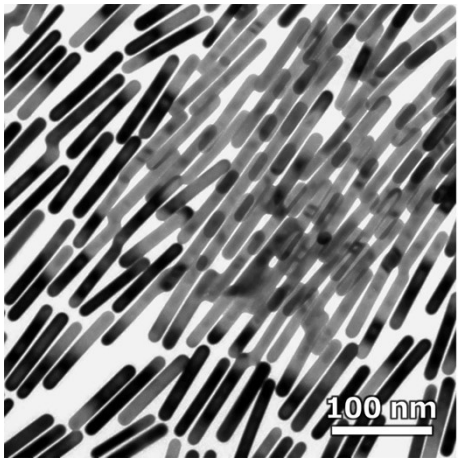

Fig. S8 TEM image of AuNR prepared by 1.2 mL reducing agent.

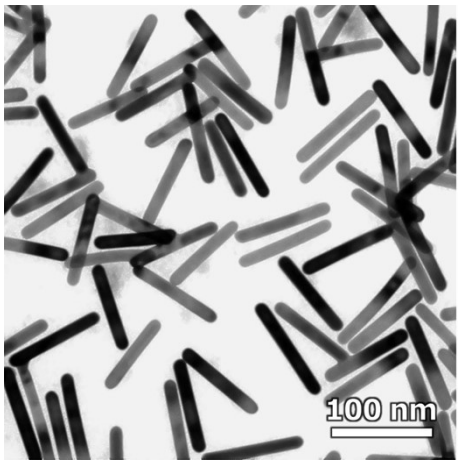

Fig. S9 TEM image of AuNR prepared by 0.4 mL gold seed.

Tab. S1 A summary of impacts of silver ion on LSPR wavelength, statistical results (length and diameter), and aspect ratio of AuNR. (Other conditions are: 0.1 M CTAB, 1.2 mL reducing agent, and 0.4 mL gold seed)

$AgNO_3$ (mL)	LSPR (nm)	Length (nm)	Diameter (nm)	Aspect ratio	Figure number
0.0	541	–	–	–	2a
0.1	597	–	–	–	–
0.15	657	41.8±1.7	16.9±0.7	2.5	2b
0.2	725.5	–	–	–	–
0.25	790	52.4±2.3	14.3±0.7	3.7	2c
0.3	854	–	–	–	–
0.35	915	65.6±2.5	12.7±0.6	4.9	2d
0.4	973	–	–	–	–
0.45	1043	–	–	–	–
0.5	1105	71.3±2.4	11.4±0.5	6.3	2e
0.55	1148.5	–	–	–	–
0.6	1180	–	–	–	–
0.7	1196.5	–	–	–	–
0.8	1200	83.2±3.3	10.5±0.6	7.9	2f
1.0	1107.5	74.1±3.1	11.1±0.5	6.7	S4

Tab. S2 A summary of impacts of CTAB on LSPR wavelength, statistical results (length and diameter), and aspect ratio of AuNR. (Other conditions are: 0.8 mL silver ion, 1.2 mL reducing agent, and 0.4 mL gold seed)

CTAB (M)	LSPR (nm)	Length (nm)	Diameter (nm)	Aspect ratio	Figure number
0.01	537.5	17.2±1.0	8.5±0.5	2.0	3a
0.02	745.5	27.0±1.2	9.0±0.6	3.0	3b
0.03	826.5	–	–	–	–
0.04	905	43.2±1.9	9.5±0.5	4.6	3c
0.05	959.5	–	–	–	–
0.07	1010.5	–	–	–	–
0.08	1050.5	60.0±2.8	9.9±0.5	6.1	3d
0.09	1119.5	–	–	–	–
0.10	1201.5	83.6±3.2	11.1±0.5	7.5	S6
0.11	1192.5	–	–	–	–
0.12	1190	–	–	–	–
0.14	1125.5	–	–	–	–
0.16	1085	84.9±5.0	14.2±0.7	6.0	3e

Tab. S3 A summary of impacts of reducing agent on LSPR wavelength, statistical results (length and diameter), and aspect ratio of AuNR. (Other conditions are: 0.1 M CTAB, 0.8 mL silver ion, and 0.4 mL gold seed)

Reducing agent (mL)	LSPR (nm)	Length (nm)	Diameter (nm)	Aspect ratio	Figure number
0.5	1103	90.6±5.0	13.4±0.6	6.8	6a
0.8	1168.5	–	–	–	–
1.0	1195	–	–	–	–
1.2	1191	82.1±3.4	10.5±0.4	7.8	S8
1.4	1169	–	–	–	–
1.6	1132.5	–	–	–	–
1.8	1095.5	66.3±2.5	10.3±0.6	6.5	6b
2.0	1049.5	–	–	–	–
2.3	1003.5	–	–	–	–
2.5	987.5	57.3±2.6	10.4±0.4	5.5	6c
3.0	935	54.0±2.9	10.3±0.5	5.3	6d
3.5	891	–	–	–	–
4.0	857.5	–	–	–	–
4.5	828	–	–	–	–
5.0	801.5	37.1±1.7	10.2±0.5	3.6	6e

Tab. S4 A summary of impacts of gold seed on LSPR wavelength, statistical results (length and diameter), and aspect ratio of AuNR. (Other conditions are: 0.1 M CTAB, 0.8 mL silver ion, and 1.2 mL reducing agent)

Seed (mL)	LSPR (nm)	Length (nm)	Diameter (nm)	Aspect ratio	Figure number
0.01	929	127.1±6.0	34.4±2.8	3.7	8a
0.02	950	–	–	–	–
0.03	968	–	–	–	–
0.04	985.5	–	–	–	–
0.05	1012	–	–	–	–
0.07	1046.5	115.6±3.9	20.6±1.2	5.6	8b
0.09	1077	–	–	–	–
0.1	1087	105.3±3.9	16.4±0.9	6.4	8c
0.2	1161.5	–	–	–	–
0.3	1186.5	–	–	–	–
0.4	1191.5	82.4±3.0	11.1±0.4	7.4	S9
0.5	1175.5	–	–	–	–
0.7	1155.5	–	–	–	–
0.9	1127	–	–	–	–
1.0	1112.5	63.3±2.4	8.8±0.6	7.2	8d
1.2	1090	–	–	–	–
1.4	1072	–	–	–	–
1.6	1051.5	–	–	–	–
2.0	1031.5	57.8±3.0	8.3±0.4	7.0	8e
2.5	1002	–	–	–	–
3.0	983	–	–	–	–
4.0	955.5	39.2±2.2	7.5±0.4	5.2	8f