Supporting information for

# Size- and time-dependent Alteration in Metabolic Activities of Human Hepatic Cytochrome P450 Isozymes by Gold Nanoparticles via Microsomal Conincubations

Ling Tang,[†] Meiling Ye,[†] Mengjun Luo,[‡] Bin Guo,*[,†] Jing Zhou,[†] Yangyuan Liu,[†] Bo Chen[†]

[†] *Key Laboratory of Chemical Biology and Traditional Chinese Medicine Research (Ministry of Education of China), Key Laboratory of Phytochemical R&D of Hunan Province, Hunan Normal University, Changsha 410081, China*

[‡] *Yiyang Medical College, Yiyang 413000, China*

* *To whom correspondence should be addressed. Tel.: +86 731 85627818; fax: +86 731 85627818. E-mail address: binnguo@126.com (B. Guo)*

**Figure S1.**

Size-dependent optical properties of tannic acid-coated AuNPs at mass concentration of 1 mg/mL and 25 µg/mL (top); a comparison of the UV/Vis spectra of gold colloid in 6 months of storage (bottom). The UV-Vis absorption spectra with the centered bands were consistent with well-dispersed, spherical AuNPs in aqueous media.

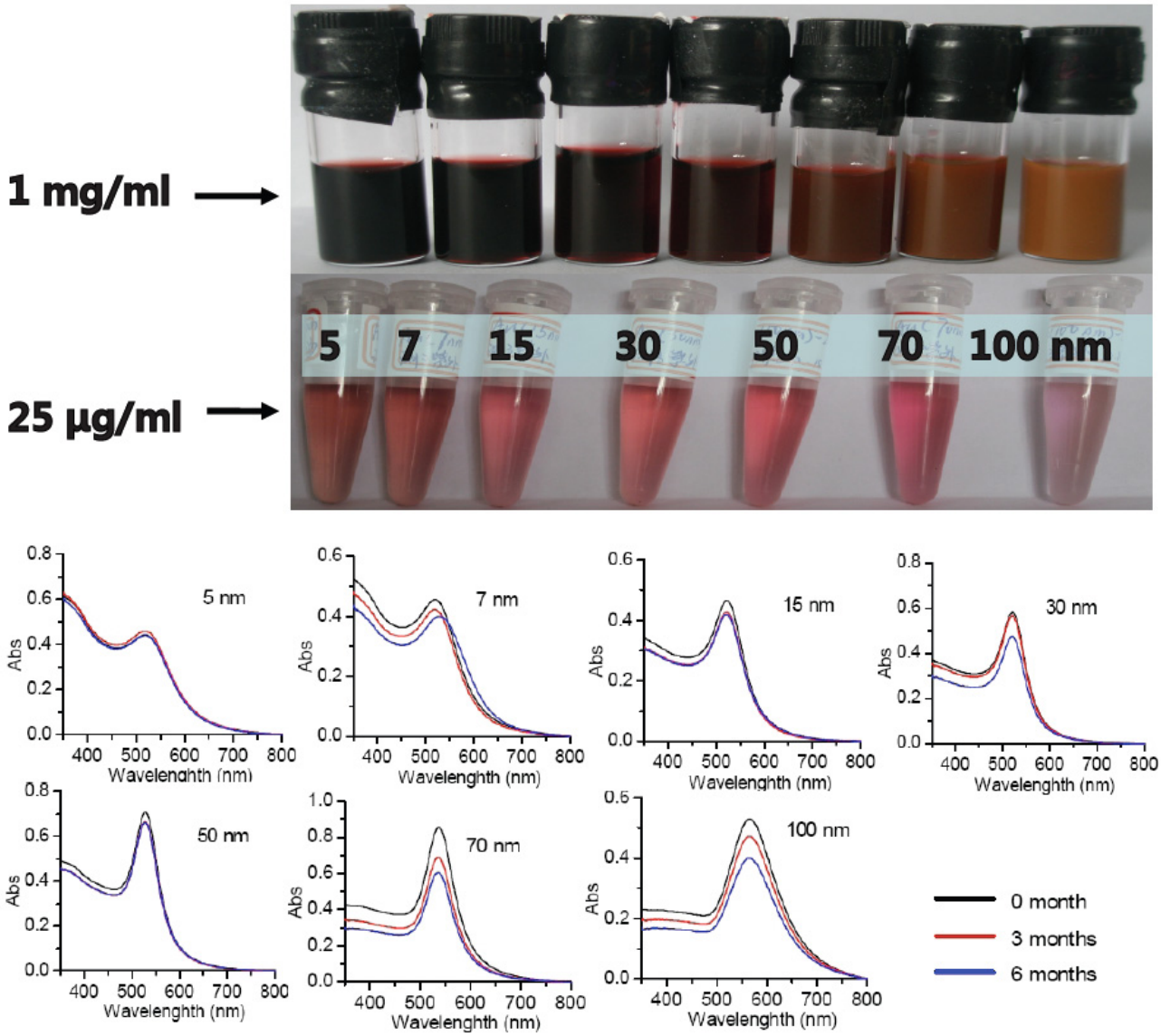
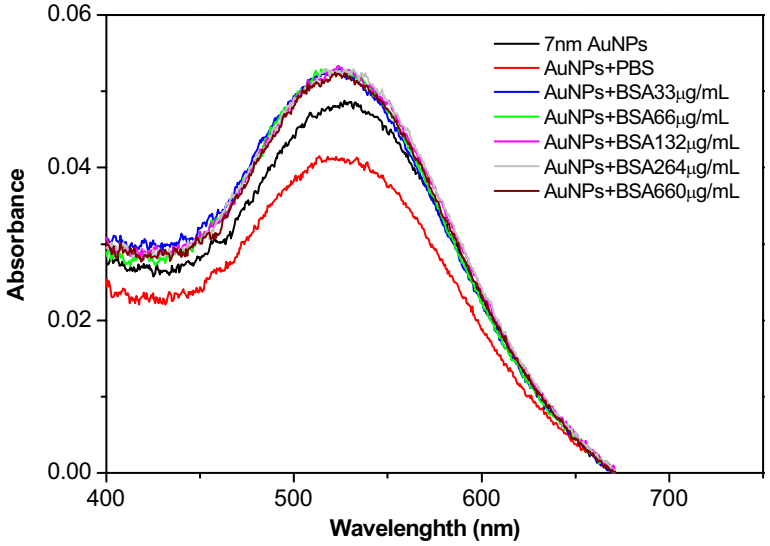


**Figure S2.**

BSA-induced alteration in UV-vis extinction spectra of AuNPs and absorbance value at $\lambda_{max}$ when initial incubating (at 0 min) with different BSA concentrations.



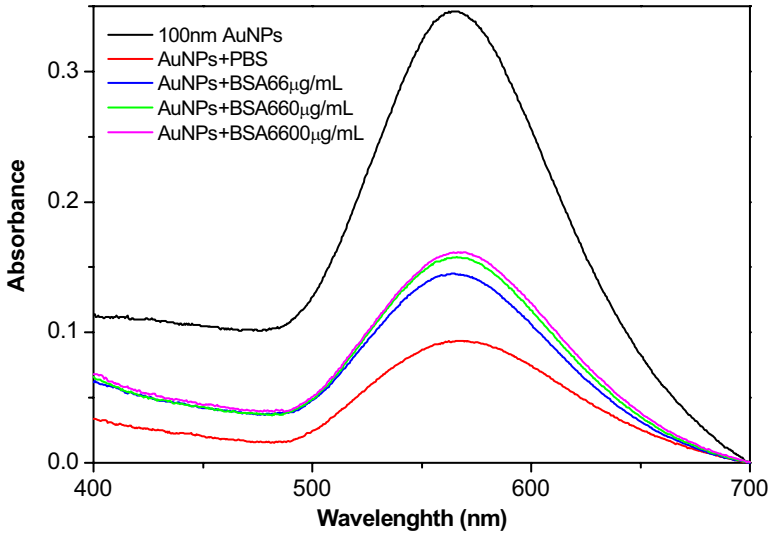



**Table S1.** Technical data sheet of physicochemical characteristics of PELCO tannic BioPure™ gold nanoparticles investigated

| Nominal size | Lot number | Diameter (nm) | Concentration (particles/mL) | Maximum absorption peak ($\lambda_{max}$, nm) | Zeta potential (mV) | Hydrodynamic diameter (nm) | Solution pH |
|---|---|---|---|---|---|---|---|
| 5 nm | DAG1519 | 4.7 ± 0.7 | $1.1 \times 10^{15}$ | 516 | N/A | N/A | 4.8 |
| 7 nm | DAG1533 | 6.5 ± 0.9 | $3.9 \times 10^{14}$ | 519 | N/A | N/A | 4.6 |
| 15 nm | DAG1490 | 15.5 ± 1.4 | $2.9 \times 10^{13}$ | 520 | N/A | N/A | 4.5 |
| 30 nm | EAW1056 | 28.6 ± 3.2 | $4.3 \times 10^{12}$ | 521 | -22.4 | 34.6 | 6.4 |
| 50 nm | DAG1442 | 50.1 ± 5.1 | $7.9 \times 10^{11}$ | 530 | -54.9 | 74.6 | 7.2 |
| 70 nm | DAG1286 | 67.5 ± 6.2 | $3.2 \times 10^{11}$ | 538 | -43.1 | 78.2 | 5.5 |
| 100 nm | JMW1048 | 97.7 ± 9.5 | $1.1 \times 10^{11}$ | 568 | -46.3 | 109.6 | 6.2 |

**Table S2.** Preparation of stock and working solution of substrates, Incubation conditions and analytical parameters for assays

| | Phenacetin *O*-Deethylase (CYP1A2) | Tolbutamide Methylhydroxylase (CYP2C9) | (*S*)-Mephenytoin 4'-Hydroxylase (CYP2C19) | Dextromethorphan *O*-Demethylase (CYP2D6) | Testosterone 6*β*-Hydroxylase (CYP3A4) | Felodipine Dehydrogenase (CYP3A4) |
|---|---|---|---|---|---|---|
| Preparation of solutions of substrate | | | | | | |
| Stock solution (mM) (vehicle) | 50.78 (ACN/$H_2O$=1:1) | 60.29 (ACN) | 38.95 (ACN/$H_2O$=1:1) | 9.95 (ACN/$H_2O$=1:1) | 21.15 (ACN) | 10.41 (ACN) |
| Working solution (mM) (vehicle) | 1.02 (PBS) | 2.41 (PBS) | 1.61 (PBS) | 0.20 (PBS) | 1.59 (ACN/$H_2O$=1:5) | 0.10 ($H_2O$) |
| Incubation conditions | | | | | | |
| Protein concentration (mg/ml) | 0.05 | 0.1 | 0.15 | 0.05 | 0.05 | 0.05 |
| Subtrates concentration (μM) | 5.08 | 120.58 | 80.5 | 9.95 | 79.67 | 5.2 |
| Incubation time (min) | 10 | 20 | 30 | 10 | 10 | 10 |
| Analyte | Acetaminophen | Hydroxy Tolbutamide | 4-Hydroxy-mephenytoin | Dextrorphan | 6*β*-Hydroxy-testosterone | Dehydro Felodipine |
| Mass spectrometer conditions | | | | | | |
| Declustering potential (V) | 78 | 72 | 96 | 96 | 98 | 110 |
| Collision energy (V) | 24 | 18 | 15 | 36 | 20 | 34 |
| Analyte m/z transition | 152.1→110.1 | 287.2→188.2 | 235.1→141.3 | 258.3→199.0 | 305.3→287.3 | 383.2→354.1 |
| Retention time (min) | 8.04 | 7.73 | 7.13 | 6.23 | 7.84 | 11.89 |
| Analytical parameters of IS | m/z transition: 303.5→ 97.3; retention time: 10.50 min; Declustering potential: 106 eV; Collision energy: 37 eV. | | | | | |