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Green Nanotechnology from Tea: Phytochemicals in Tea as Building Blocks for production of Biocompatible Gold Nanoparticles

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Tea extract (>80% theaflavins) Initiated/ Stabilized Gold Nanoparticles (T-AuNP-5)

To a 20 mL vial was added 3.5 mg of Tea extract (> 80% theaflavins; Sigma), 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~540 nm indicated the formation of gold nanoparticles.

Epicatechin gallate Initiated/Stabilized Gold Nanoparticles (T-AuNP-6)

To a 20 mL vial was added 2.2 mg of Epicatechin gallate, 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles.

Catechin Initiated/ Stabilized Gold Nanoparticles (T-AuNP-7)

To a 20 mL vial was added 2.2 mg of Catechin, 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles. TEM measurements confirmed the size distribution of gold nanoparticles.

Catechin gallate Initiated/ Stabilized Gold Nanoparticles (T-AuNP-8)

To a 20 mL vial was added 2.2 mg of Catechin gallate, 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles.

Epicatechin Initiated/ Stabilized Gold Nanoparticles (T-AuNP-9)

To a 20 mL vial was added 2.2 mg of Epicatechin, 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles.

Epigallocatechin Initiated/Stabilized Gold Nanoparticles (T-AuNP-10)

To a 20 mL vial was added 2.2 mg of Epigallocatechin, 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles.

Epigallocatechin gallate (EGCG) Initiated/ Stabilized Gold Nanoparticles (T-AuNP-11)

To a 20 mL vial was added 2.2 mg of Epigallocatechin gallate , 6 mL of doubly ionized water (DI). The reaction mixture was stirred continuously at 25 °C for 3 min. To the stirring mixture was added 100 µL of 0.1 M NaAuCl₄ solution (in DI water). The color of the mixture turned purple-red from pale yellow within 5 minutes indicating the formation of gold nanoparticles. The reaction mixture was stirred for an additional 15 minutes at 25 °C. The gold nanoparticles thus obtained were characterized by UV-Vis absorption spectroscopy and TEM. Plasmon resonance band at ~535 nm indicated the formation of gold nanoparticles. TEM measurements confirmed the size distribution of gold nanoparticles.

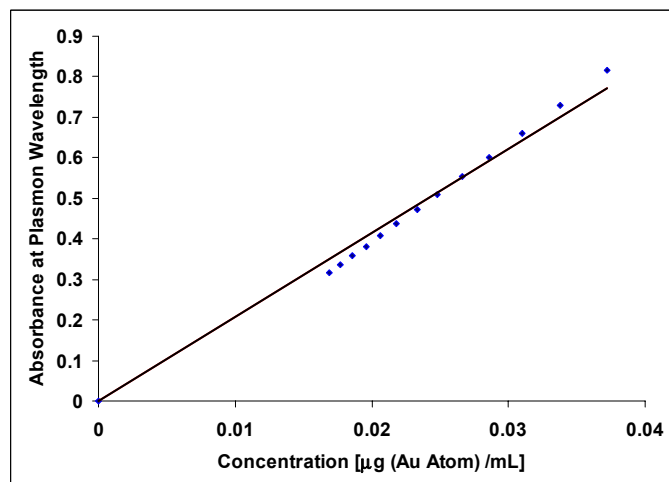


Fig. S1. Change in plasmon absorption maximum (λ_{max}) of T-AuNP-1 under various dilution conditions.