

Supporting Information for

**Effect of Tryptophan Residues on Gold Mineralization
by a Gold Reducing Peptide**

Makoto Ozaki, Shuhei Yoshida, Maho Oura, Takaaki Tsuruoka, and Kenji Usui*

[*] Dr. Kenji Usui, Mr. Makoto Ozaki, Mr. Shuhei Yoshida, Ms. Maho Oura, Dr. Takaaki Tsuruoka
Faculty of Frontiers of Innovative Research in Science and Technology (FIRST),
Konan University, 6500047, Kobe (Japan)
E-mail: kusui@konan-u.ac.jp (K. Usui)

CONTENTS:

Page S2:	Fig. S1 for CD spectra of AuBP1, 2W-AuBP1, and 3W-AuBP1.
Page S3:	Fig. S2 for growth of absorbance derived from SPR at 540 nm over time of each peptide
Page S4:	Fig. S3 for TEM images of the sample after gold mineralization using 100 μ M peptides
Page S5:	Fig. S4 for kinetic analysis of reduction of Au^{3+} to Au^0 using 100 μ M 3W-AuBP1
Page S6:	Fig. S5 for UV-VIS data of the sample after gold mineralization using various concentration peptides
Page S7:	Fig. S6 for TEM images of the sample after gold mineralization using peptides of various concentrations
Page S8:	Fig. S7 for TEM image and particle histogram of the commercial gold nanoparticle
Page S9:	Fig. S8 for catalytic activity data of reduction reaction of 4-nitrophenol with/without gold nanoparticles
Page S10:	Fig. S9 for Arrhenius plots of the sample using mineralized gold nanoparticles
Page S11:	Fig. S10 for TEM images of mineralized gold nanospheres using 100 μ M peptides after reduction reaction of 4-nitrophenol
Page S12:	Fig. S11 for HPLC and MS for purified AuBP1, 2W-AuBP1, and 3W-AuBP1

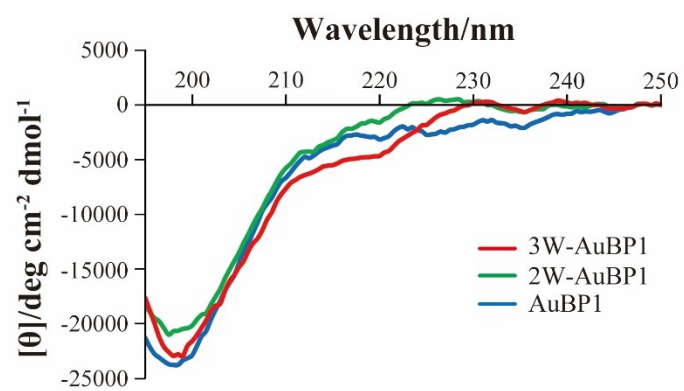


Fig. S1 CD spectra of 10 μM AuBP1, 2W-AuBP1, and 3W-AuBP1.

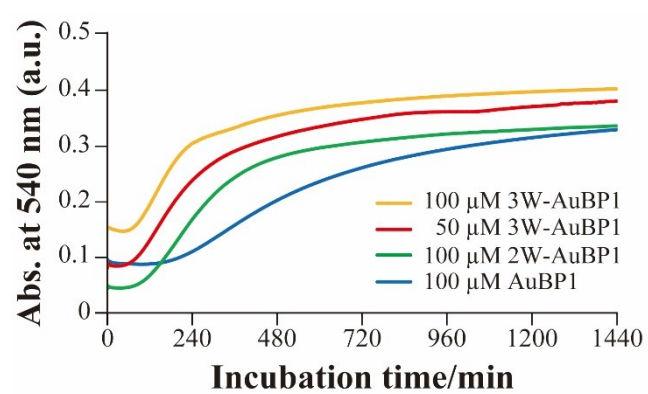


Fig. S2 Growth of absorbance derived from SPR at 540 nm over time of each peptide.

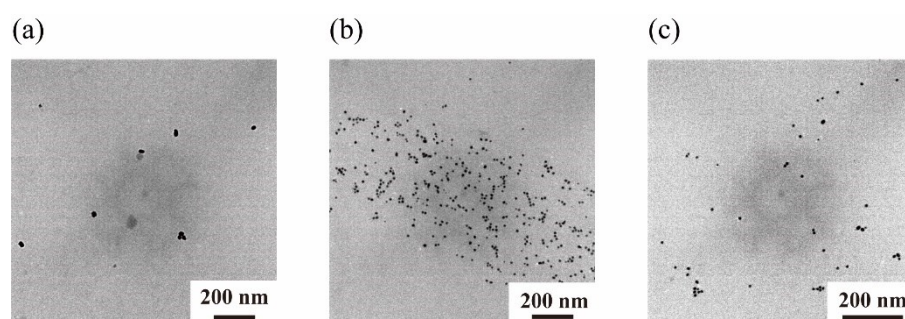


Fig. S3 TEM images of the sample after gold mineralization using (a) 100 μ M AuBP1, (b) 100 μ M 2W-AuBP1, and (c) 100 μ M 3W-AuBP1.

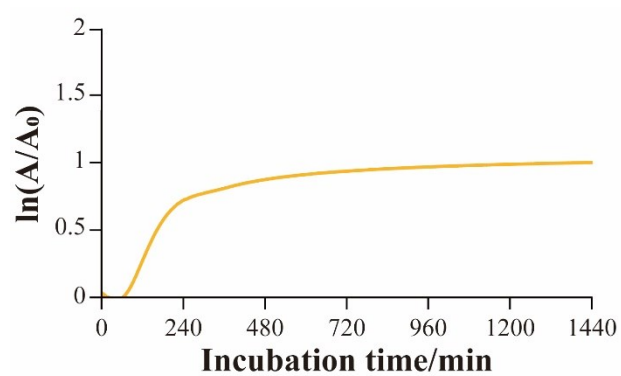


Fig. S4 Pseudo-first-order kinetic analysis of the reduction of Au³⁺ to Au⁰ using 100 μ M 3W-AuBP1.

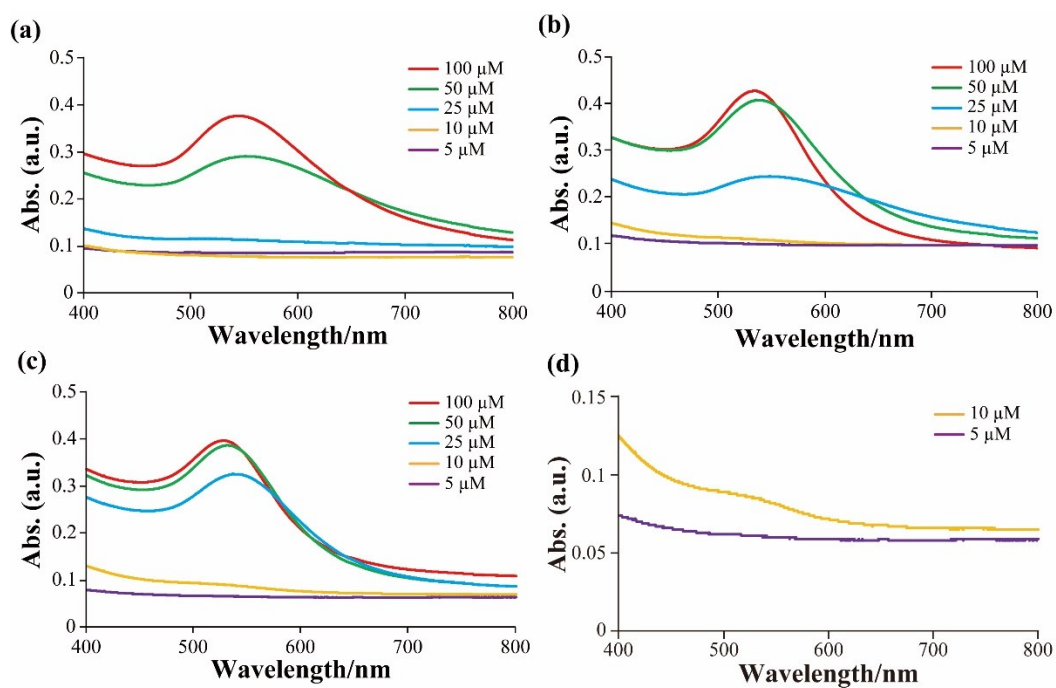


Fig. S5 UV-VIS spectra of the sample after gold mineralization using (a) AuBP1, (b) 2W-AuBP1, and (c), (d) 3W-AuBP1.

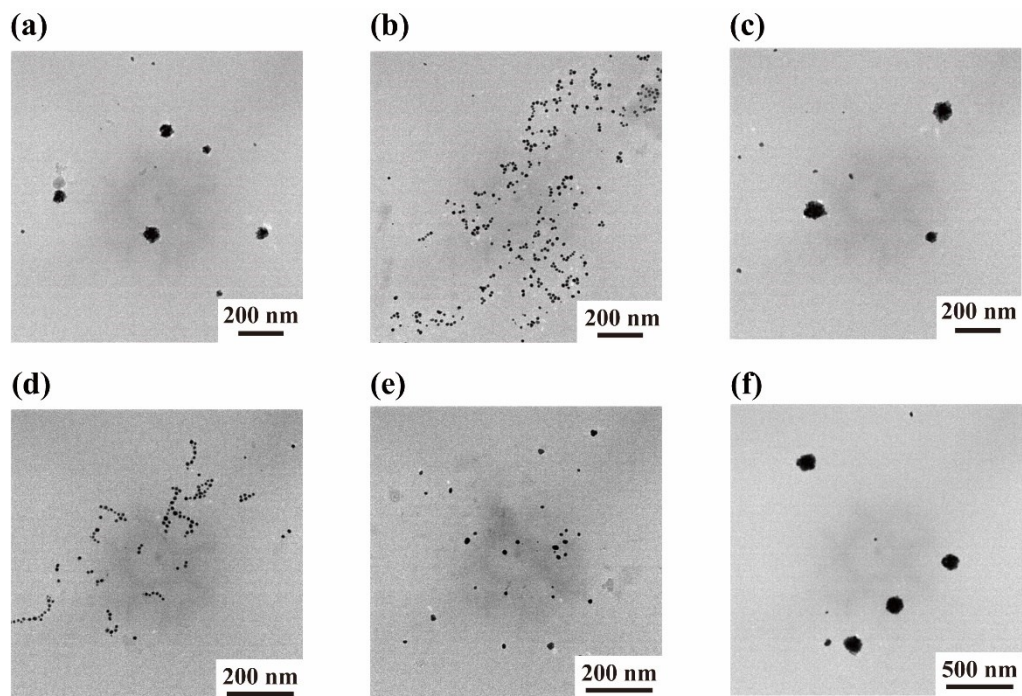


Fig. S6 TEM images of the sample after gold mineralization using (a) 50 μM AuBP1, (b) 50 μM 2W-AuBP1, (c) 25 μM 2W-AuBP1, (d) 50 μM 3W-AuBP1, (e) 25 μM 3W-AuBP1, and (f) 10 μM 3W-AuBP1.

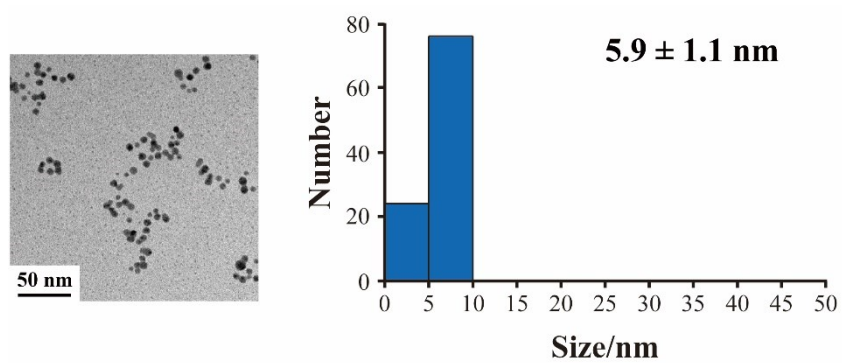


Fig. S7 TEM image and particle histogram of the commercial gold nanoparticle (Sigma-Aldrich, 741949).

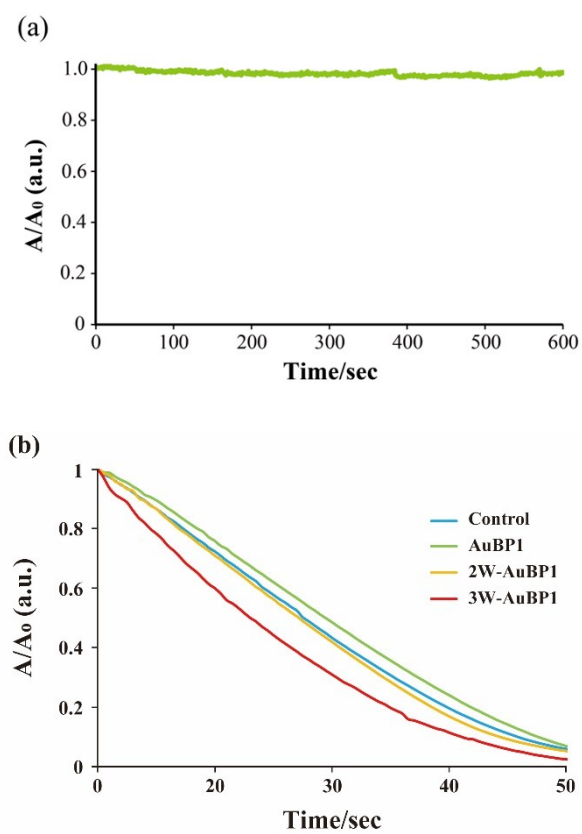


Fig. S8 (a) Time course of reduction reaction of 4-nitrophenol to 4-aminophenol without gold nanoparticles at 20°C. (b) Time course of reduction reaction of 4-nitrophenol to 4-aminophenol using gold nanoparticles at 30°C.

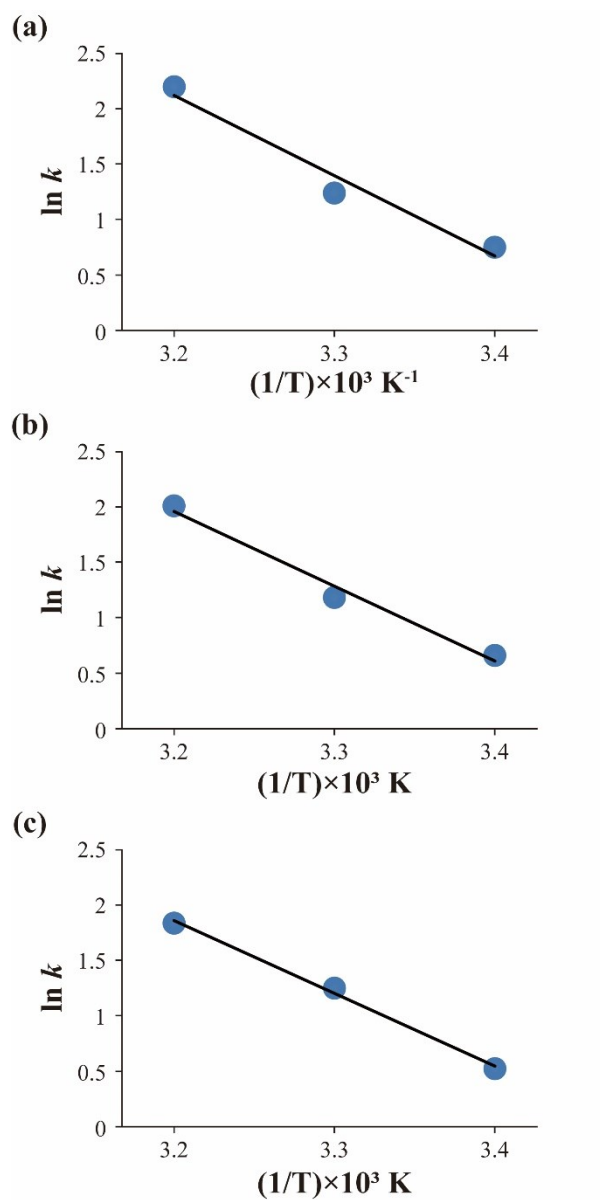


Fig. S9 Arrhenius plots of reduction reaction of 4-nitrophenol using (a) AuBP1, (b) 2W-AuBP1, and (c) 3W-AuBP1.

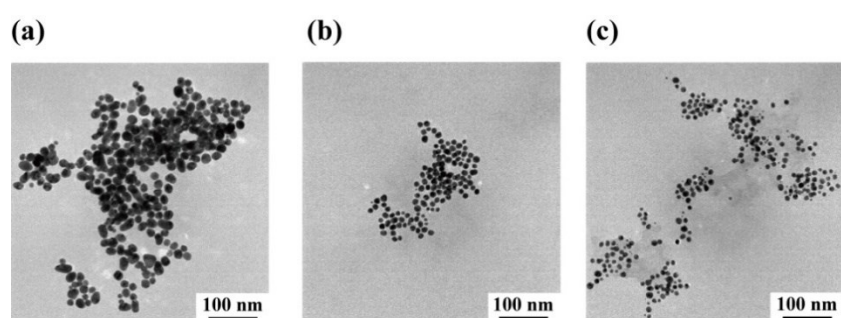


Fig. S10 TEM images of mineralized gold nanospheres with (a) 100 μM AuBP1, (b) 100 μM 2W-AuBP1, and (c) 100 μM 3W-AuBP1 after reduction reaction of 4-nitrophenol to 4-aminophenol is completed.

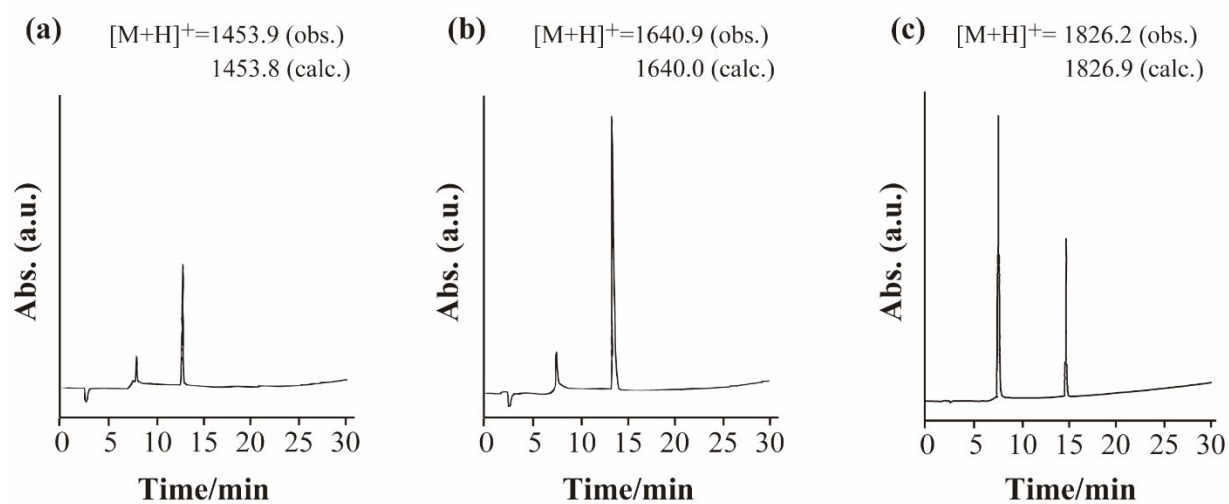


Fig. S11 HPLC for purified (a) AuBP1, (b) 2W-AuBP1, and (c) 3W-AuBP1 separated on an ODS column (150 × 4.6 mm, 5 mm) with MilliQ water (containing 0.1% TFA) using a gradient from 0% to 100% acetonitrile (containing 0.08% TFA) over 30 min, 1.0 mL/min; detection at 220 nm.