Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information

Au^{3+}-induced gel network formation of proteins

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S1 Au^{3+} reduction by HDL

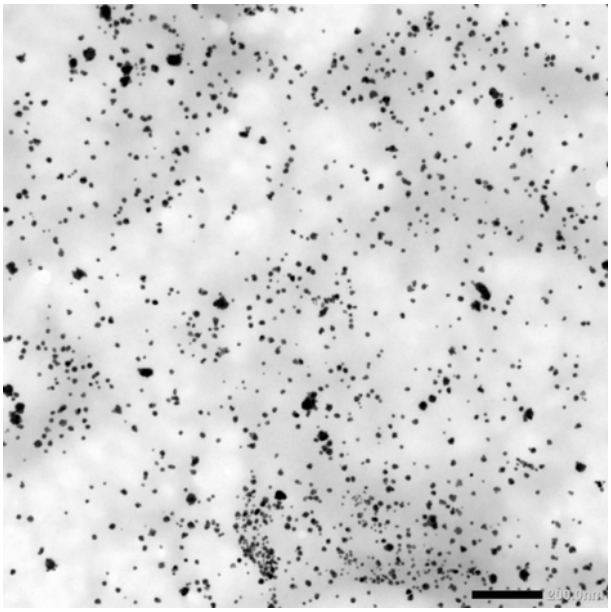

Fig. S1 TEM image of Au-HDL mixture (0.1% (w/v)) after 3 days of preparation. Scale bar is 200 nm.

S2 Influence of temperature

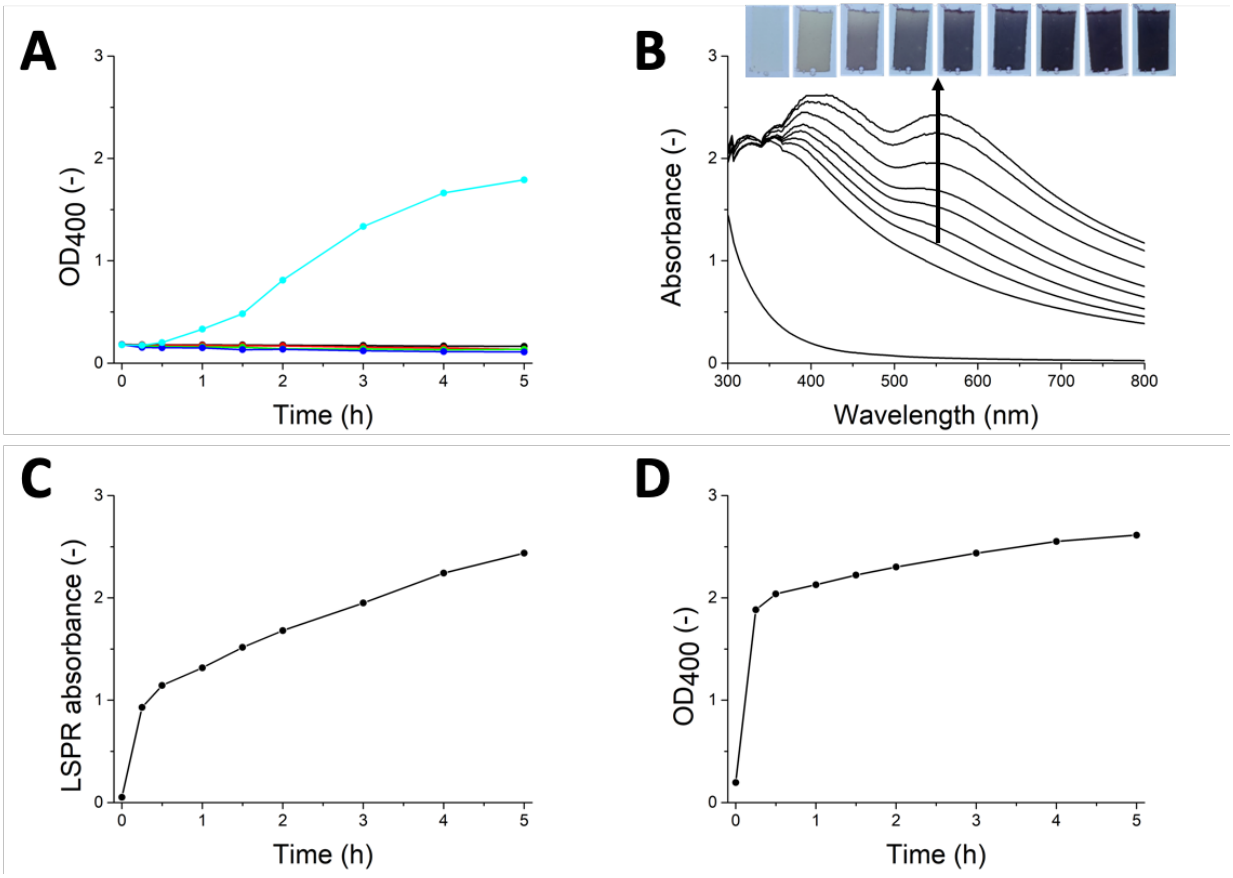

Fig. S2 (A) Time-dependent OD_{400} plots of 3.0% (w/v) HDL solutions in 1.71 M NaCl incubated at T = 4 °C (black dotted line), 20 °C (red dotted line), 40 °C (green dotted line), 60 °C (blue dotted line) and 80 °C (cyan dotted line). (B) Solid UV-Vis absorbance and derived (C) LSPR absorbance (at λ = 555 nm) and (D) OD_{400} spectra of Au-HDL mixture incubated at T = 80 °C followed for 5 h (insets) optical photographs showing gradual color change of the Au-HDL mixture at different time intervals.

S3 FTIR study of Au-HDL interactions

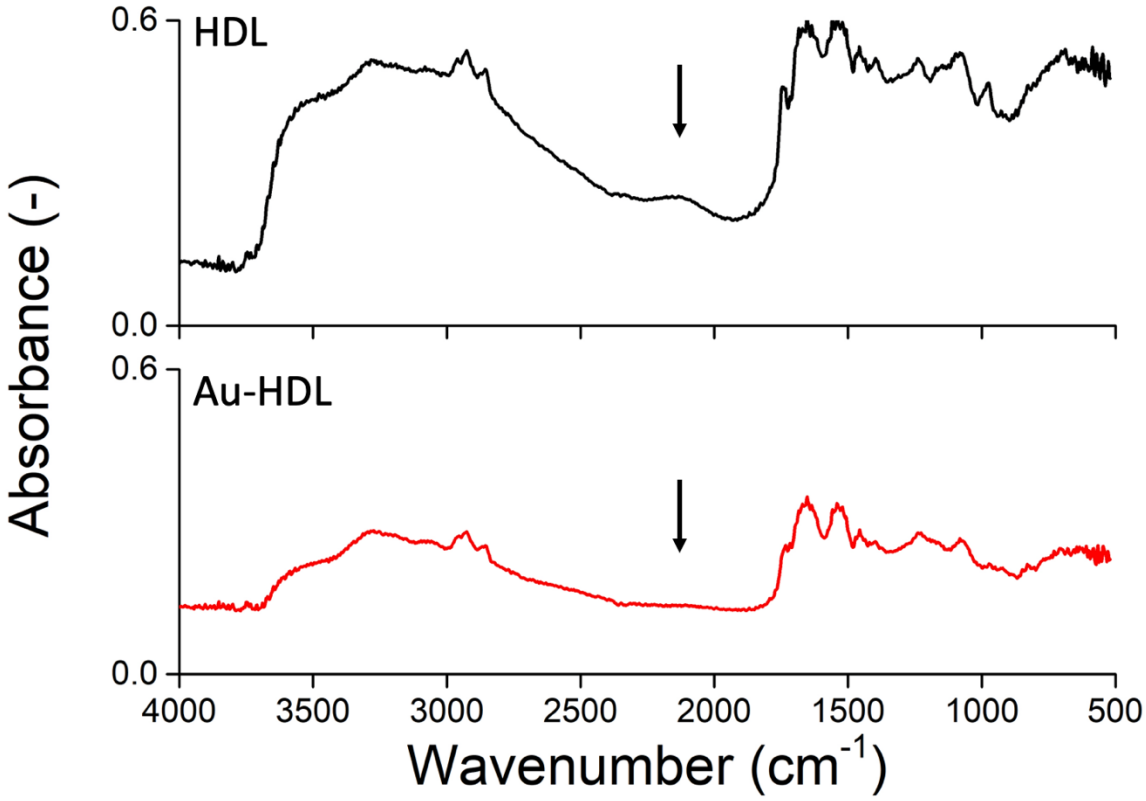

Fig. S3 FTIR spectra of HDL (top, black graph) and Au-HDL network (bottom, red graph) in the 4000-500 cm^{-1} frequency region at ambient conditions. The arrows are pointing at the SH stretching vibrations.

S4 SDS gel electropherogram of Au-HDL mixtures followed in time

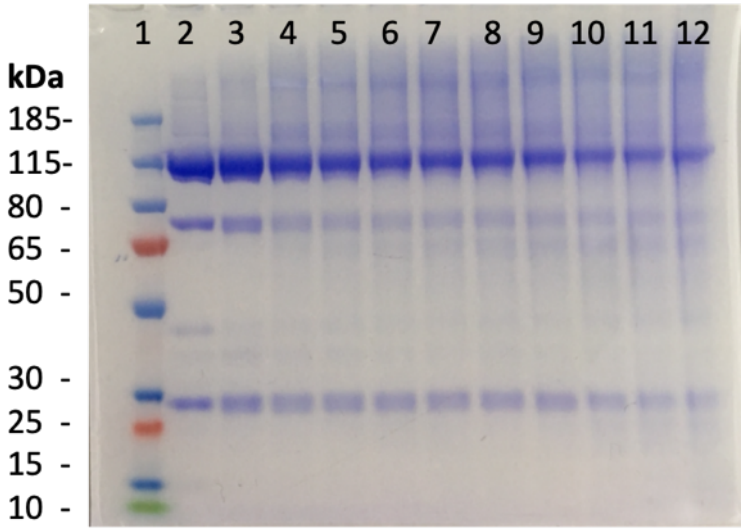

Fig. S4 SDS gel electropherogram of the protein marker (lane 1), native HDL (lane 2) and Au-HDL mixtures at different time spots (lane 3-12: 0, 10, 20, 30, 40, 50 60, 120, 180 and 240 mins).

S5 Additional UV-Vis absorbance and fluorescence spectra

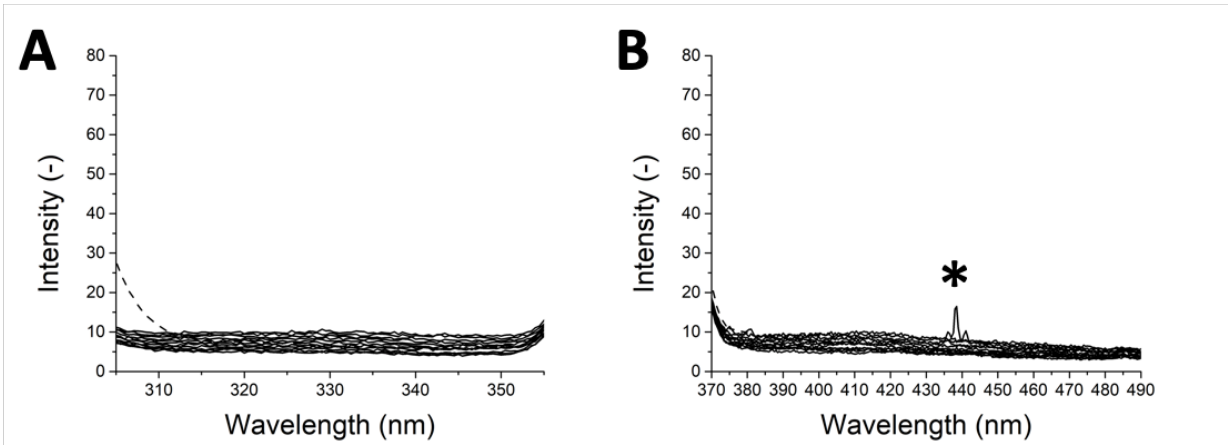

Fig. S5 Fluorescence (A) excitation (λ_{em} = 410 nm) and (B) emission spectra (λ_{ex} = 325 nm) of 0.01 %. (w/v) HDL (dashed line) and Au-HDL mixture (solid line) in 1.71 M NaCl at different time intervals (0-5 h, every 30 min). The peak marked * arised from an artefact during measurement.

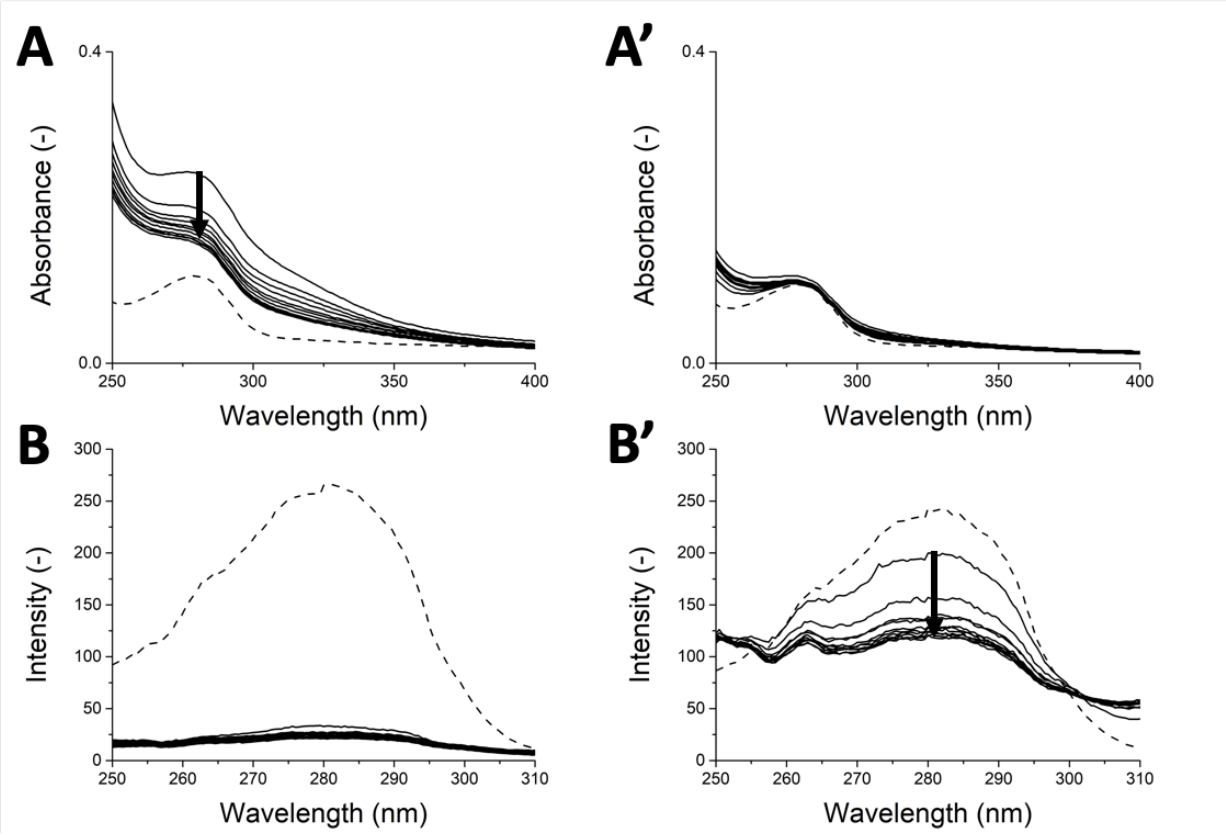

Fig. S6 (A) UV-Vis absorbance and (B) fluorescence excitation (λ_{em} = 410 nm) spectra of 0.01% (w/v) HDL (dashed line) and Au-HDL mixture (solid line) in 1.71 M NaCl before and (A', B') after KCN treatment at different time intervals (0-5 h, every 30 min, indicated by the black arrow).

S6 Au^{3+}-induced gel network and AuNPs formation of BSA and WPI

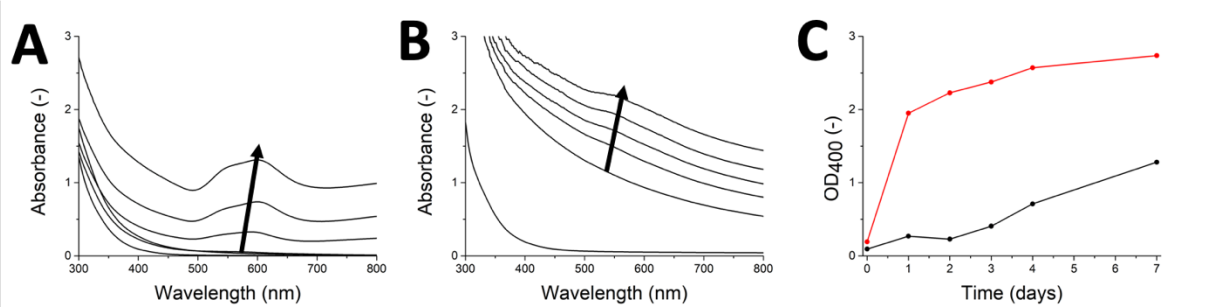

Fig. S7 Solid UV-Vis absorbance spectra of (A) Au-BSA and (B) Au-WPI mixtures incubated at 20 °C followed in time from 0-7 days. The characteristic LSPR peaks of AuNPs increased in time, indicated by the arrows. (C) Derived OD_{400} spectra of BSA (black dotted-line) and WPI (red dotted-line) against time.