Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Protein fibril assisted chiral assembly of gold nanorods

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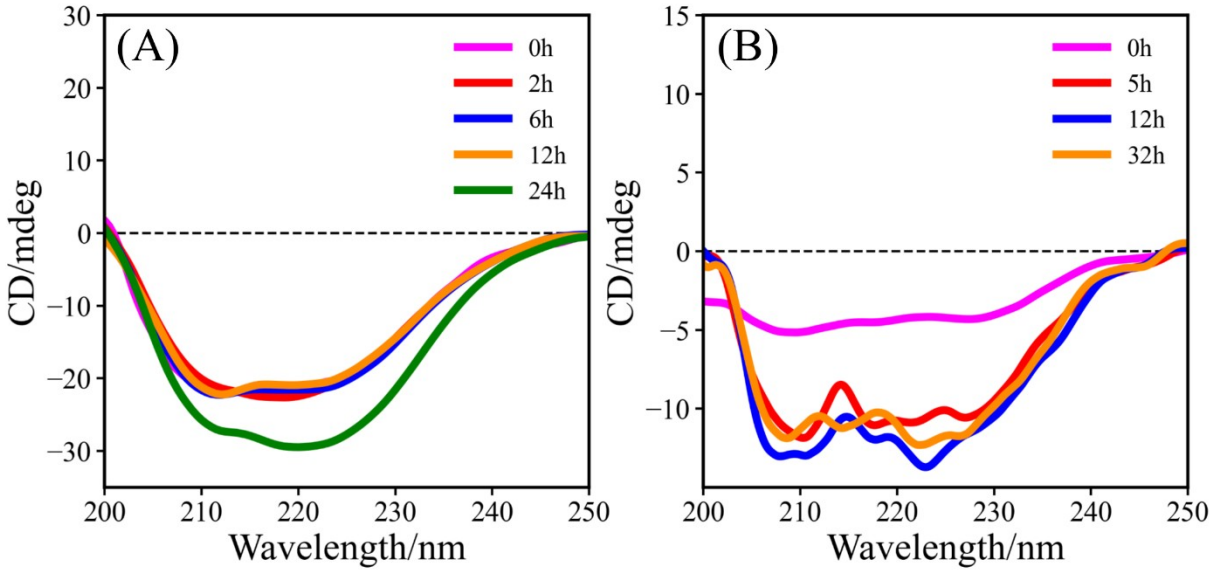
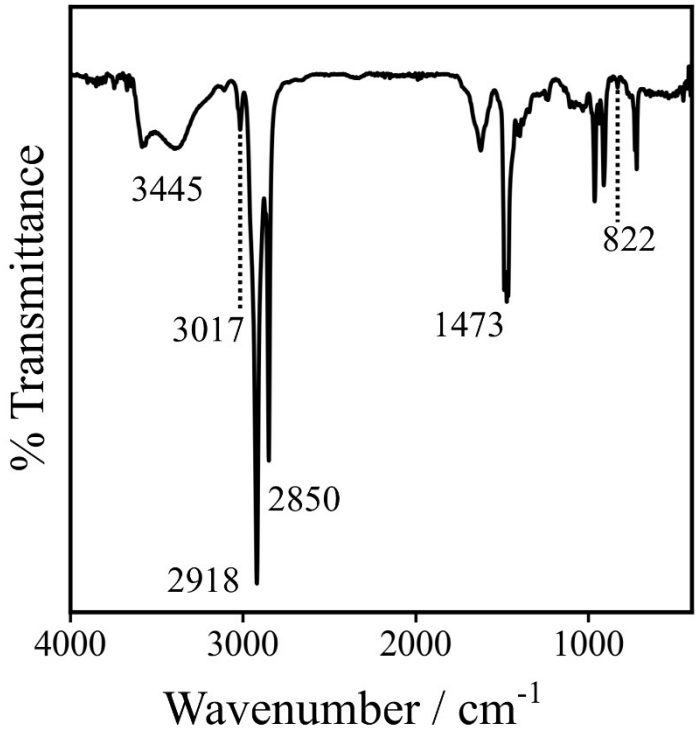
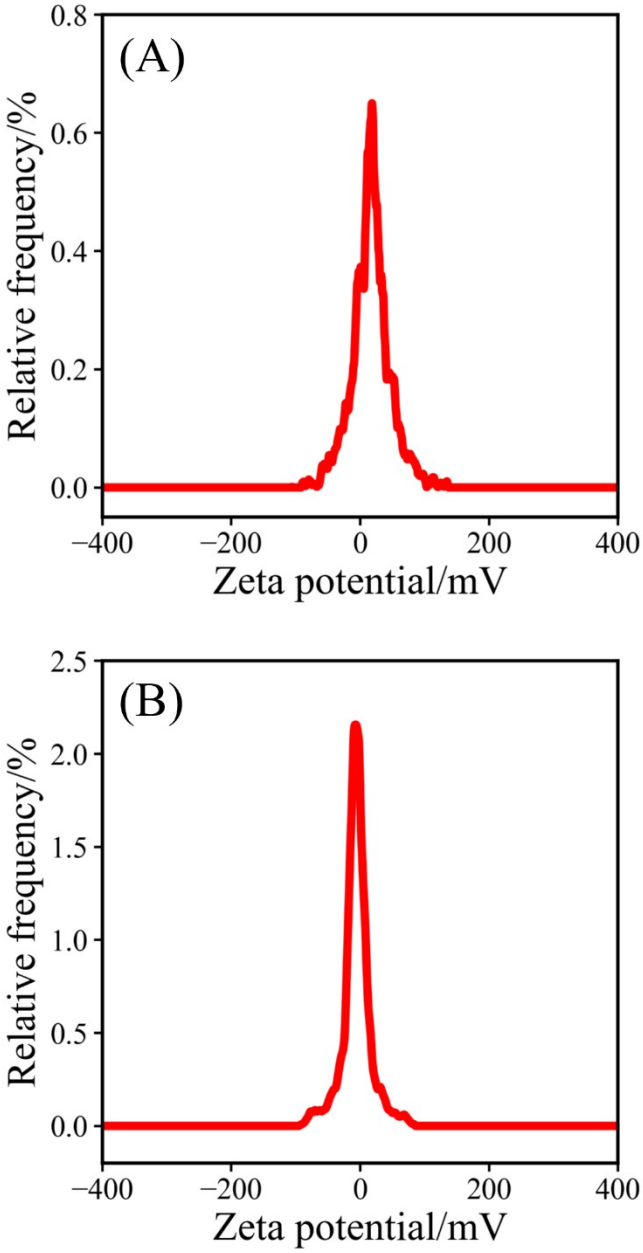


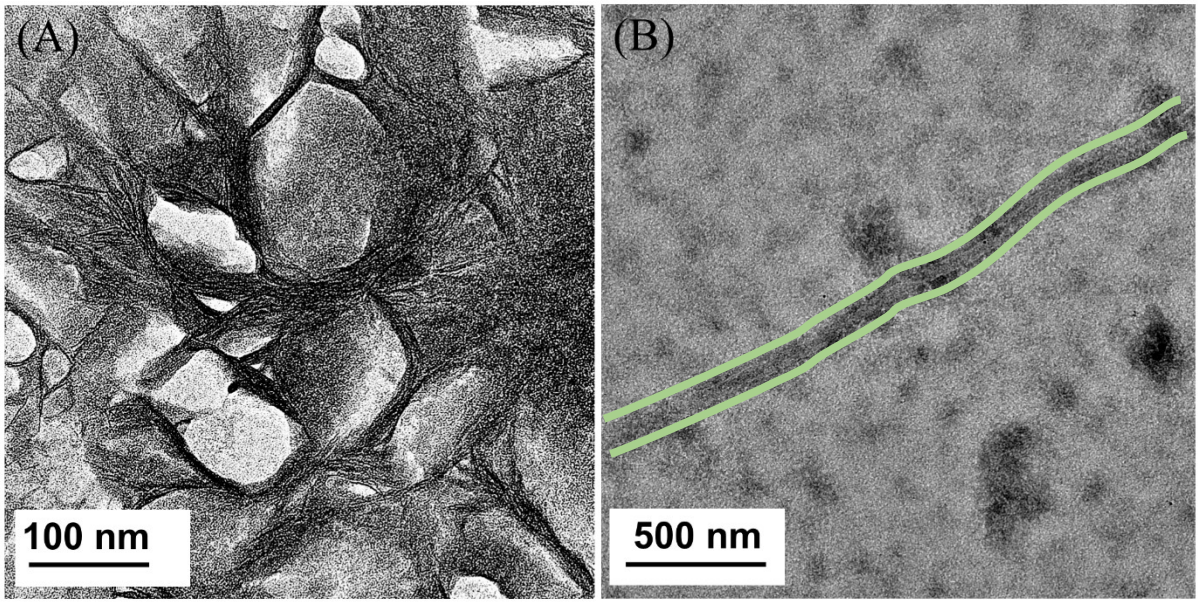
Supplementary figure 1: *Time dependent fibrillation of 0.2 mg/mL* (A) *BSA and (B) Lysozyme fibrils monitored by CD spectroscopy.*



Supplementary figure 2: *FTIR spectra of synthesized gold nanorods*



Supplementary figure 3: *Zeta potential measurements of (A) gold nanorods and (B) BSA fibrils*



Supplementary Figure 4: *TEM images of BSA fibrils*

Supplementary Methods 5: Calculation of the extinction cross section of the AuNRs

The Mie-Gans theory was used to calculate the extinction coefficient of the synthesized AuNR [1]. For simplicity, a pair of particles are considered at first, and hence we utilise a simple quasistatic limit approach to calculate the extinction spectra of two these two interacting particles. In the quasistatic limit, the dimensions of the particles are assumed to be very small relative to the wavelength of the incident radiation. According to the Classius-Mossoti relation, the particle polarizability α can be expressed as

$$\alpha = \frac{4\pi\epsilon_0 ab^2(\epsilon_m - \epsilon_h)}{3L_x(\epsilon_m + \kappa\epsilon_h)} \quad (1)$$

where ϵ_m and ϵ_h are the complex dielectric constants of the metal particle (Au in this case) and its host medium, respectively , ϵ_0 is the vacuum. an ellipsoid of revolution is a reasonable representation for a rodlike particle; the relevant dimensions are thus its semimajor axis a and its semiminor axis b

The screening factor, κ is dependent upon the particle shape and is related to the depolarization factor, L_x is the depolarization factor via $\kappa_x = L_x^{-1} - 1$ where x denotes the semiaxis parallel to the incident field.

$$L_a = \frac{1-e^2}{e^2}\left(\frac{1}{2e}\ ln\left(\frac{1+e}{1-e}\right) - 1\right) \quad (2)$$

$$e = \left(1 - \frac{b^2}{a^2}\right)^{\frac{1}{2}} \quad (3)$$

The depolarization factor for an external field parallel to b can be derived from L_a via

$$L_b = (1 - L_a)/2 \quad (4)$$

The extinction cross section, (C_{ext}), is easily calculated as the sum of the absorption (C_{abs}),and scattering cross sections (C_{sca}) via

$$C_{ext} = C_{abs} + C_{sca} \quad (5)$$

$$C_{abs} = k\ ln\ \alpha \quad (6)$$

$$C_{sca} = \frac{k^4}{6\pi}|\alpha|^2 \qquad (7)$$

In the calculations, the dielectric constant of water (medium) was taken as $\epsilon_m = 1.78$ and the ϵ_{Au} was taken from Ciesielski et al [2]. The length and diameter of the AuNRs were obtained from the measurement of the TEM images.

References

1. M. Gluodenis and Colby A. Foss *J. Phys. Chem. B* 2002, **37**, 9484–9489

2. A. Ciesielski, L. Skowronski, M. Trzcinski, E. Górecka, P. Trautman, T. Szoplik, *Surface Science*, 2018, **674**, 73-78.