Supporting Information

Unveiling the interaction of protein fibrils with gold nanoparticles by plasmon enhanced nano-spectroscopy

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S1. Atomic Force Microscopy characterisation of lysozyme fibrillation.

Lysozyme fibrillation was investigated using AFM topographic imaging at selected times, *i.e.* after 2.5 h (A), 8 h (B), 24 h (C) and 48 h (D) of thermal treatment. Representative images are presented in Fig. S1. After 2.5 h, it is possible to recognise the first stage of the fibrillation process which is the formation of globular protein aggregates (Fig. S1A). The average size of such prefibrillar oligomers was extrapolated by height profiles. The obtained average value of 24 nm is consistent with those reported in the literature about lysozyme fibrillation[1]. As the fibrillation continues, a hierarchical assembly of protein oligomers in protofibrils (Fig. S1B, C) and a subsequently assembly in mature fibrils (Fig. S1D) are observed.

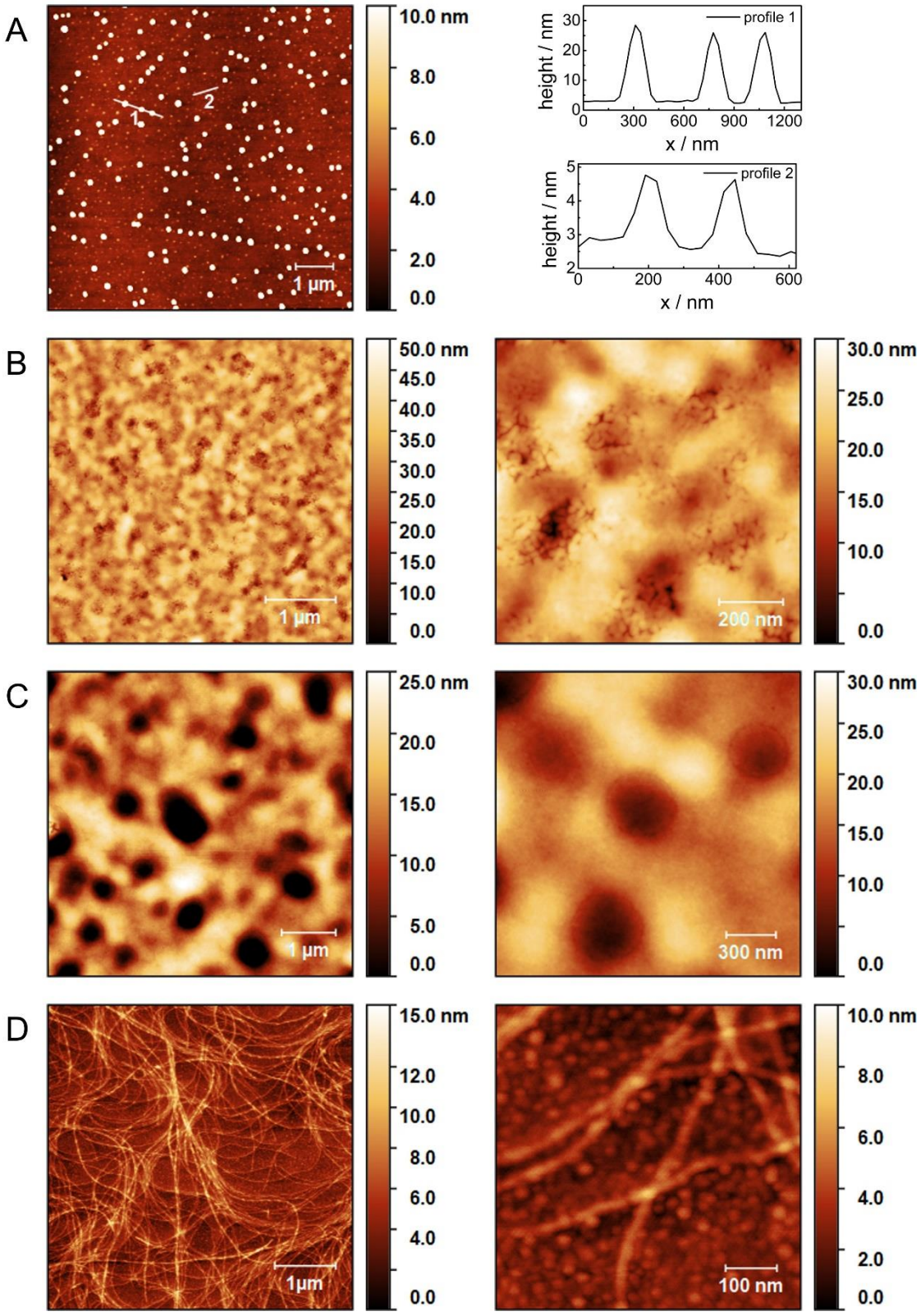

Figure S1. AFM topography images of the fibrillation kinetics of lysozyme. Images were acquired after 2.5 h (A), 8 h (B), 24 h (C) and 48 h (D) of thermal treatment. Right to A, the height profiles correspond to the sections marked by white lines in A.

S2. SERS spectrum of citrate-capped AuNPs.

The SERS spectrum of the citrate-capped 60 nm AuNPs is reported in Figure S2, where the principal bands of the molecule are assigned according to previous works[2,3].

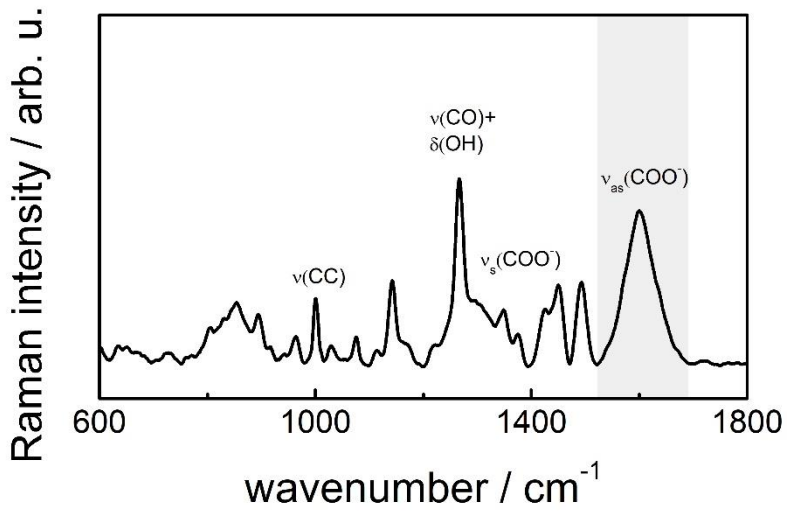

Figure S2. SERS spectrum acquired at 633 nm of dried citrate-capped 60 nm AuNPs deposited onto a glass slide.

References

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[3]E. Vinogradova, A. Tlahuice-Flores, J. J. Velazquez-Salazar, E. Larios-Rodriguez, M. Jose-Yacaman, Surface-enhanced Raman scattering of N-acetylneuraminic acid on silver nanoparticle surface. *Journal of Raman Spectroscopy*, 2014, **45** (9), 730-735.