**Supporting Information**

# Effect of Silica Nanoparticles on the Amyloid Fibrillation of Lysozyme

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**Methods:**

**X-ray diffraction studies:**

The physical state of the prepared SiNPs was determined through powder X-ray diffraction (XRD) studies, carried out on a Bruker AXS Diffractometer D8 powder XRD, Germany, using Cu-Kα radiation (λ = 1.5418 Å) at the applied voltage of 40 kV and at a scan rate of 3° $min^{-1}$ between the 2θ range of 2° - 50°.

**Field Emission Scanning Electron Microscopy (FESEM) and Transmission Electron Microscopy (TEM):**

FESEM and TEM images of SiNPs were obtained from a NOVANANOSEM 450 field emission electron microscope operating at 5 kV and TECNAI G2–20STWIN TEM microscope (operating voltage 80kV) respectively. For the imaging measurements using FESEM, SiNPs (5 μM) were placed on cleaned glass slide and air-dried followed by gold coating. The TEM imaging was performed with SiNPs solution (5 μM) placed on a carbon coated grid and dried before experiments.

**Results:**

**Characterization of the prepared SiNPs:**

SiNPs prepared in sol gel method were characterized by DLS, zeta potential, XRD, FTIR, FESEM and TEM imaging (Figure S1a-f). Experimental observation indicates the formation of spherical, mono-dispersed nanoparticles of diameter around 50 - 60 nm. However, a larger distribution is observed around 200 nm which is likely to appear because of some aggregate nanoparticles. The prepared SiNPs have high negative charges in buffer medium of pH 7.4, but exist as neutral particles at acidic pH (pH 2).

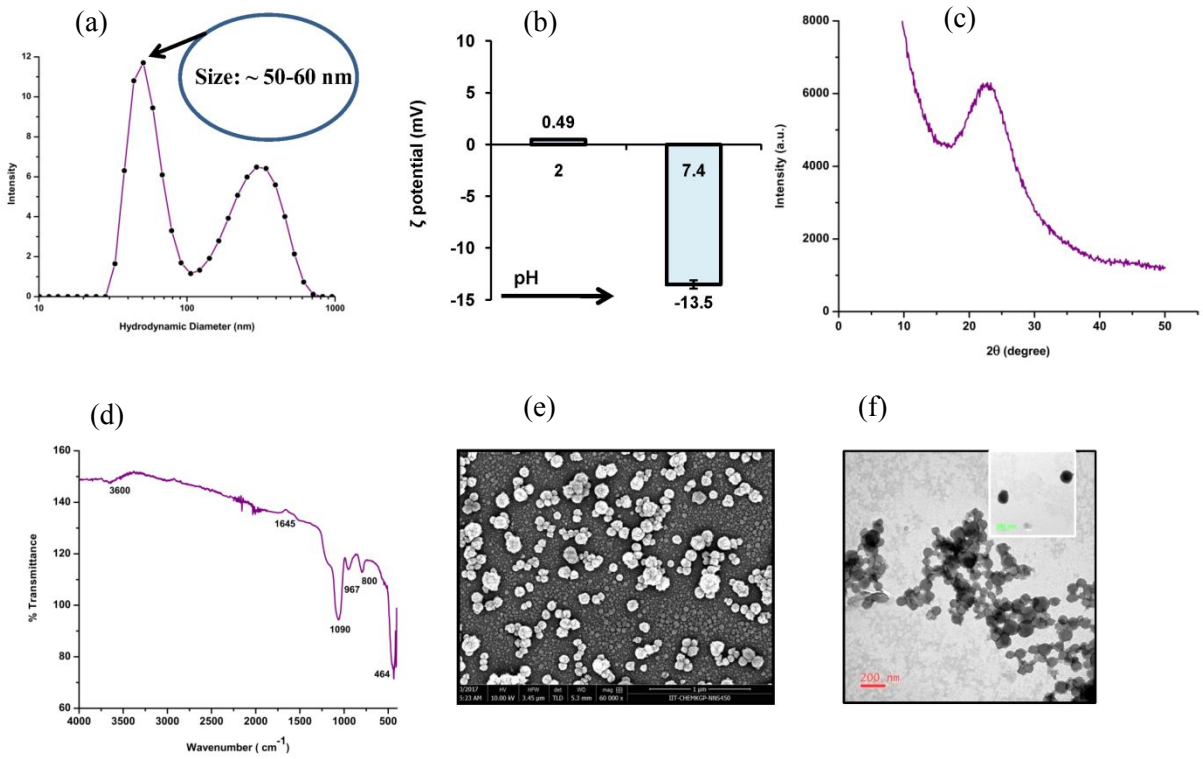


**Figure S1**: Characterization of SiNPs (a) size determination of SiNPs using DLS measurement, (b) zeta potential measurements of SiNPs at pH 2 and 7.4, (c) XRD plot of solid and dried SiNPs (d) shows the FTIR spectrum of solid SiNPs using diamond ATR and (e) and (f) represent the FESEM (scale bar 1 μm) and TEM images (scale bar 200 nm) of SiNPs

**Estimation of the amount of HEWL adsorbed on the SiNPs at pH 2:**

UV based spectrophotometric method has been employed to estimate the amount of adsorbed HEWL by SiNPs. For this study, a certain concentration of native HEWL (2.145 mg/mL) was added to an aqueous dispersion of 1 mg/mL of SiNPs. Then, absorbance spectra at 280 nm were recorded for native HEWL solutions with and without SiNPs (Figure S2). The spectrum for SiNPs treated HEWL was recorded after 1 h of the addition of native HEWL solution into 1 mg/mL of SiNPs solution. The adsorptive capacity was calculated by the following equation.

$$\eta = \frac{m_{HEWL}\,(A_{HEWL} - A_{SiNPs})}{m_{SiNPs} \times A_{HEWL}}$$

where, $\eta$ stands for the adsorbed amount of HEWL by 1 mg of SiNPs (mg $g^{-1}$ ), $m_{HEWL}$ refers to the total weight of HEWL (mg), $m_{SiNPs}$ is the dry weight of SiNPs (mg) taken for adsorption studies, $A_{HEWL}$ refers to the UV absorbance value at 280 nm for native HEWL solution without SiNPs, and $A_{SiNPs}$ is the absorbance value of supernatant (obtained after centrifugation) after adsorption in 1 mg of SiNPs. The amount of HEWL adsorbed by 1 mg/ml of SiNPs is estimated to be 0. 05 mg.

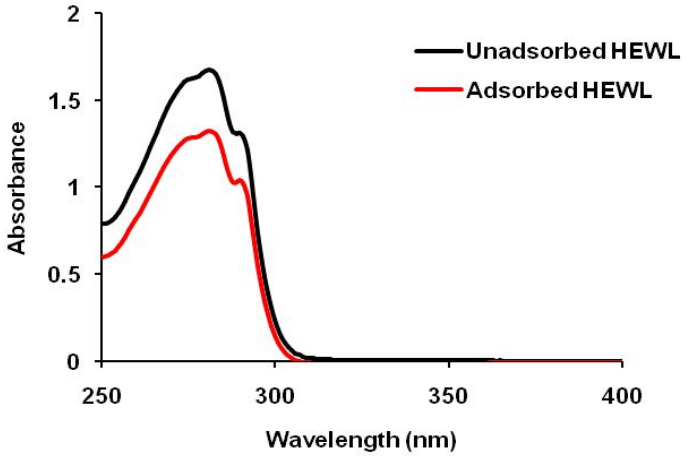


**Figure S2**: UV absorption spectra for the native and HEWL treated with SiNPs