Supplementary Information

Self-Assembled Surfactant Cyclic Peptide Nanostructures as Stabilizing Agents

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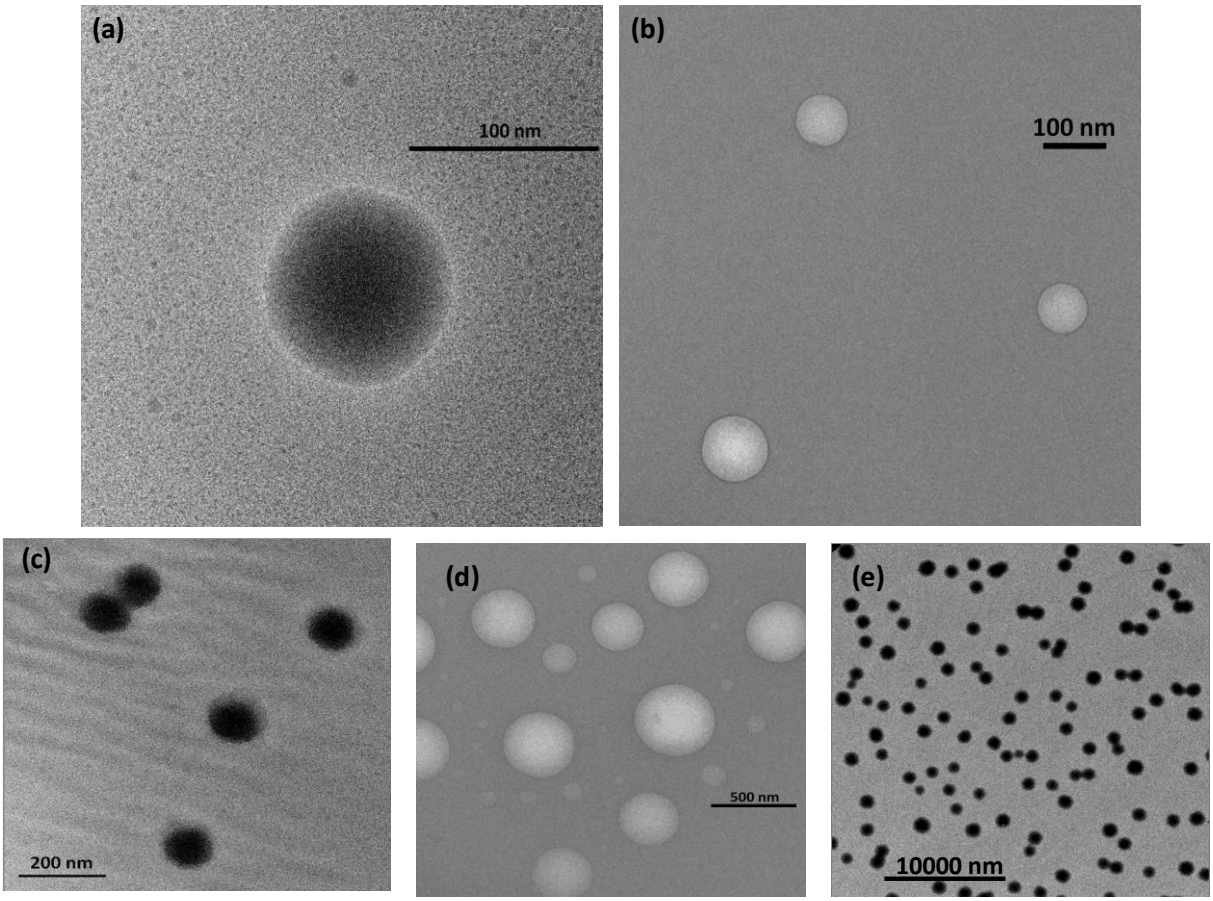

Fig. S1. (a) and (b) Conventional TEM image of nanostructure formation from $[WR]_4$ (4 days aged peptide solution, size 70-85 nm) (without negative staining); (c) TEM images of self-assembled structures of $[WR]_3$ in water after 2 weeks (without negative staining); (d) TEM images of self-assembled structures of $[WR]_4$ in water after 2 weeks (without negative staining); (e) TEM images of self-assembled structures of $[WR]_5$ in water after 2 weeks (without negative staining).

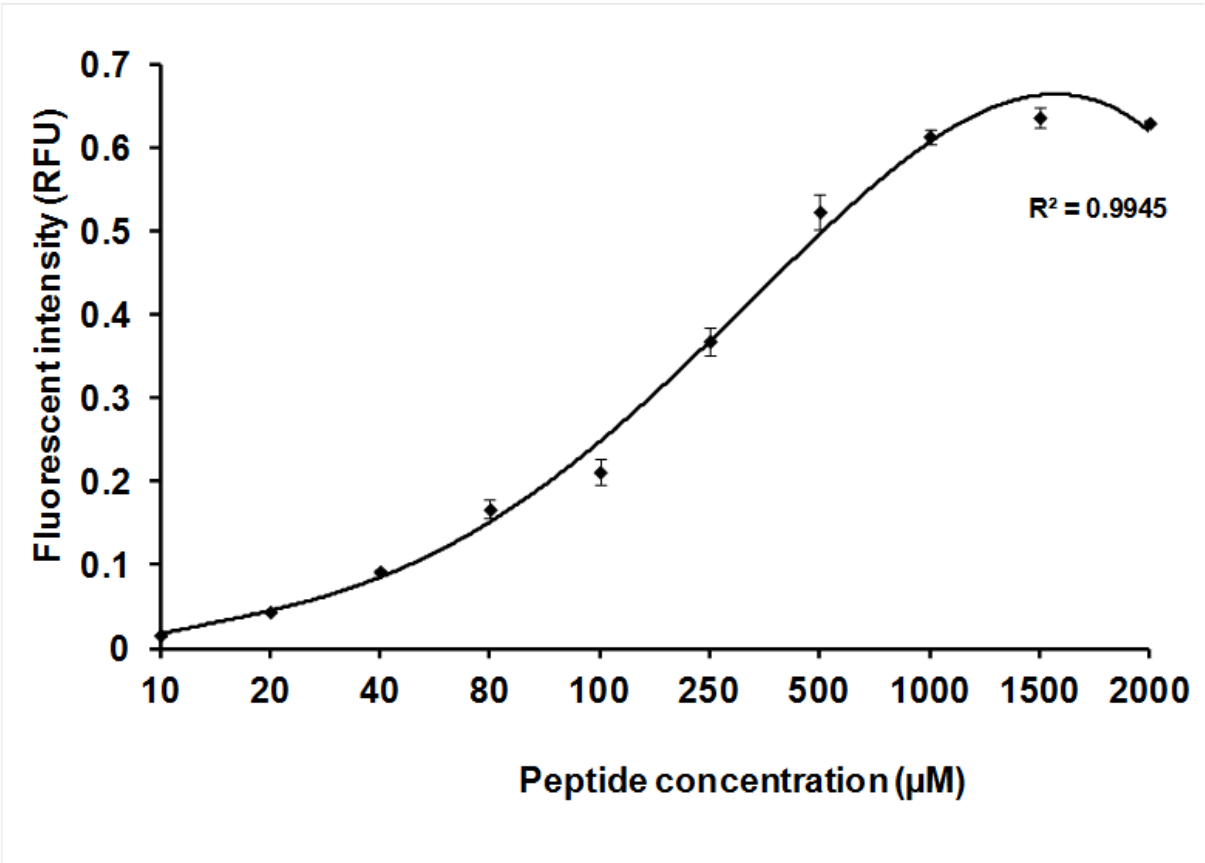

Fig. S2. Concentration-dependent fluorescence of $[WR]_4$.

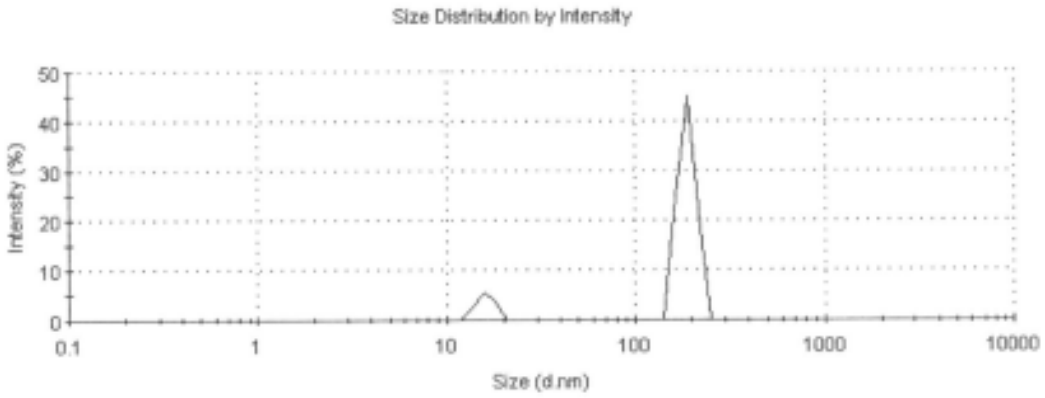

Fig. S3. DLS size distribution of nanostructures formed by $[WR]_5$ (100 μM aqueous solution).

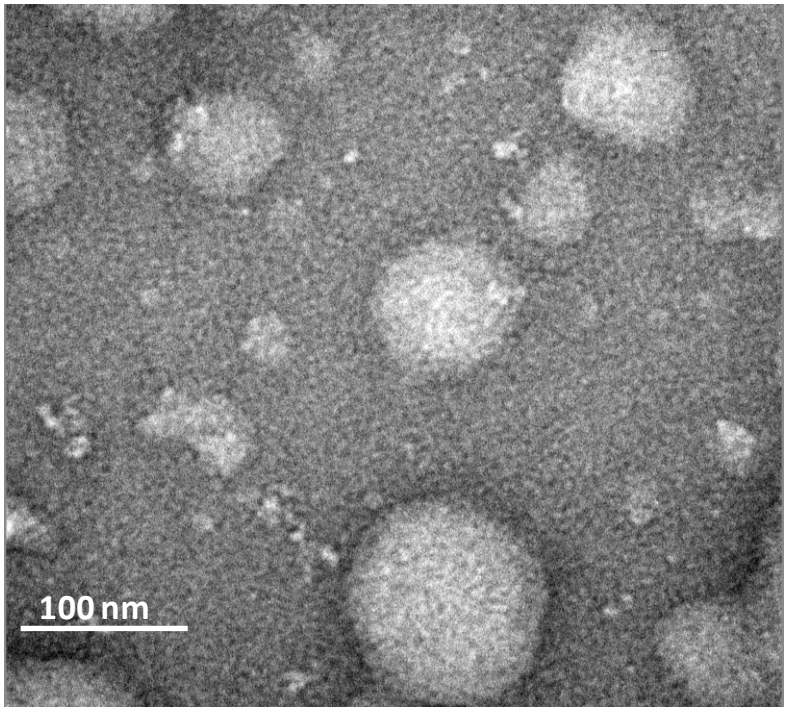

Fig. S4. TEM image of $[WR]_5$ in water (2 mM) after 12 days.

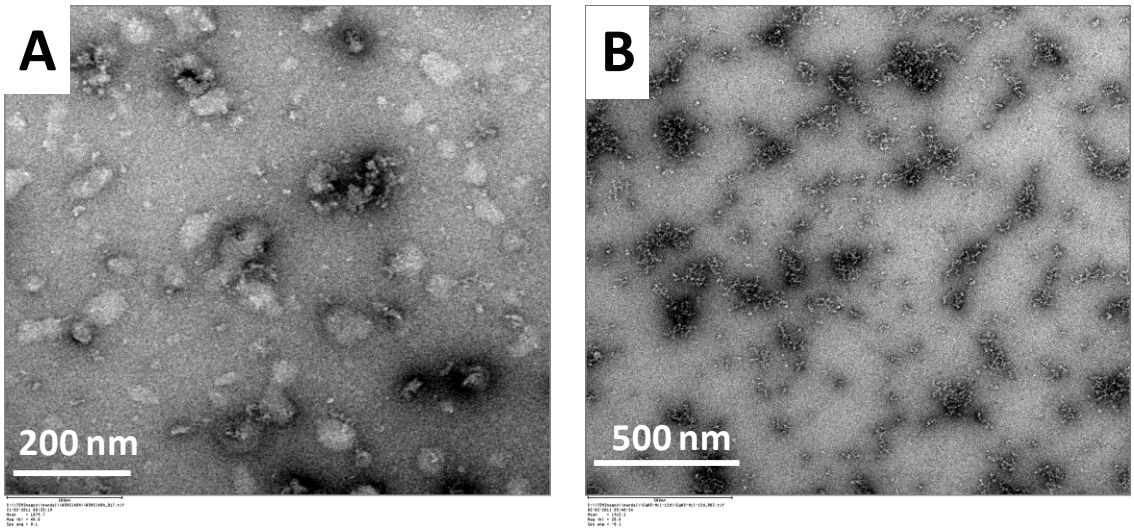

Fig. S5. Negatively stained TEM images of self-assembly of $[WR]_5$ (2 mM) in 0.02 N HCl after 48 h (A) and 12 days (B).

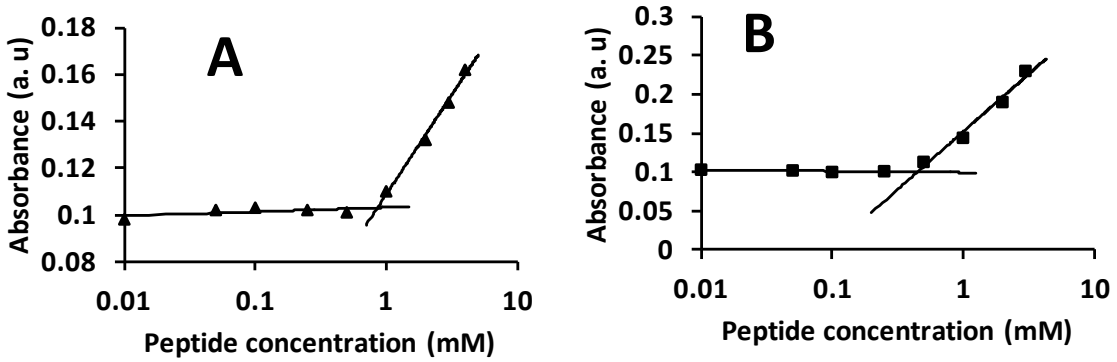

Fig. S6. Turbidity measurements of $[WR]_5$ in water (A) and in PBS (B).

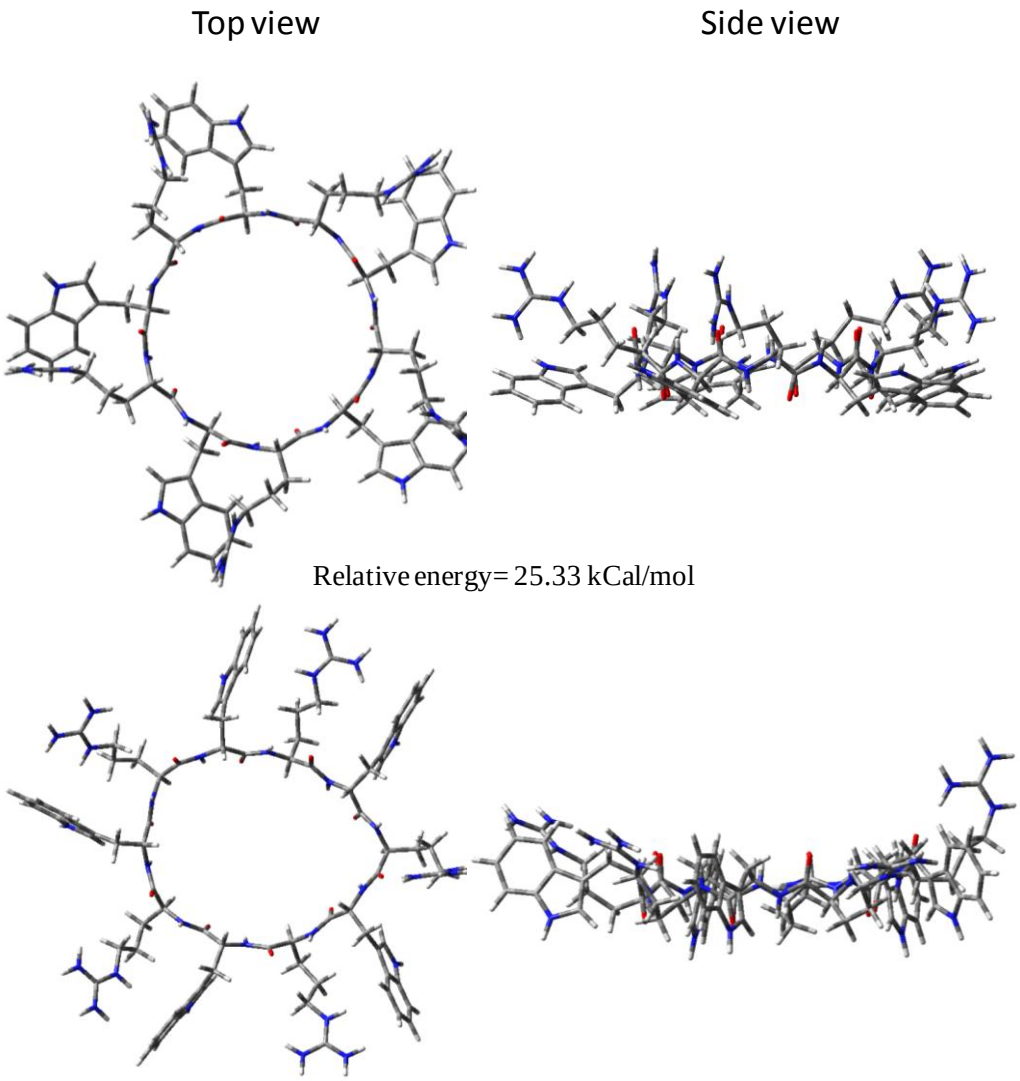

Fig. S7. Two different conformers of $[WR]_5$.

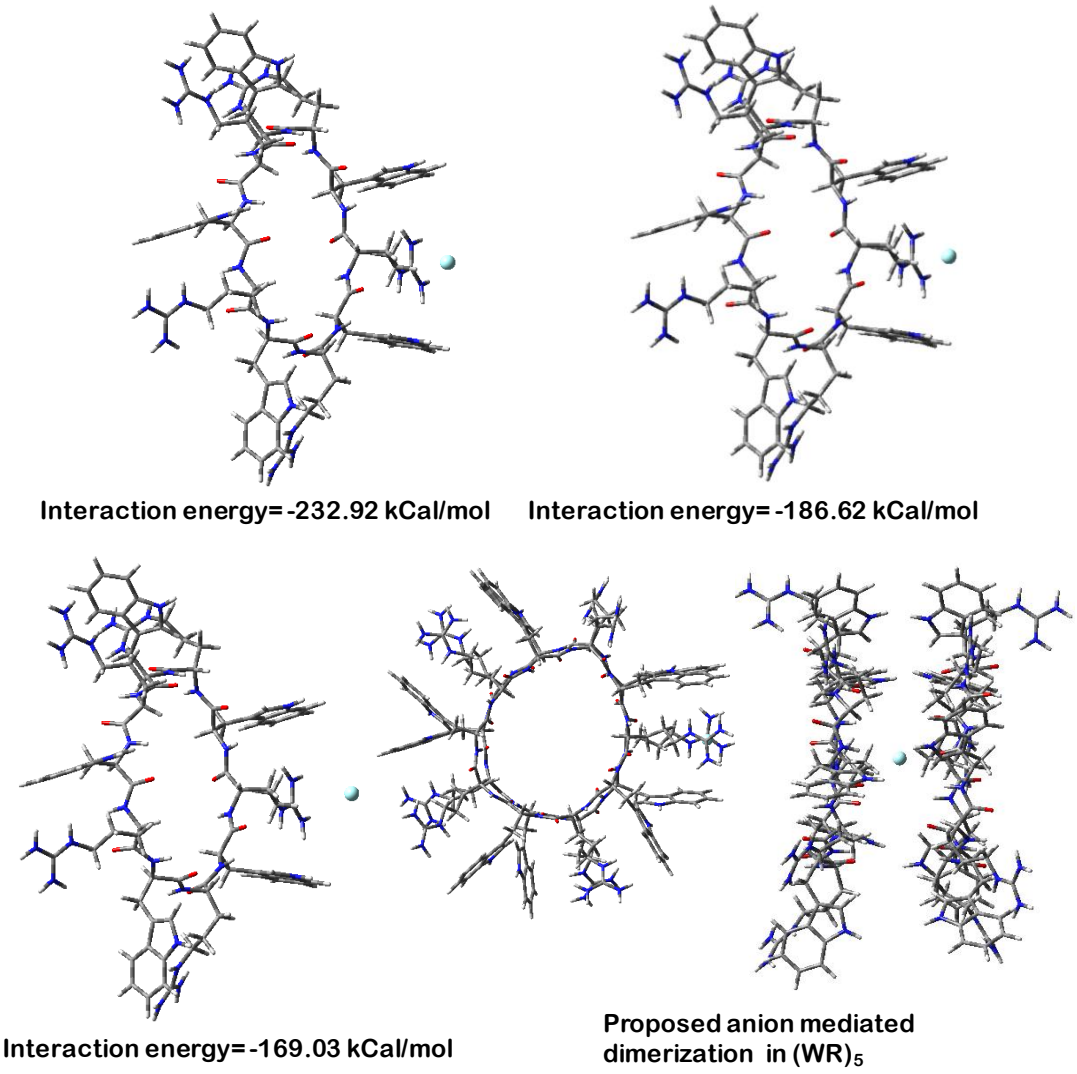

Fig. S8. Fluoride counterion-assisted dimerization of $[WR]_5$.

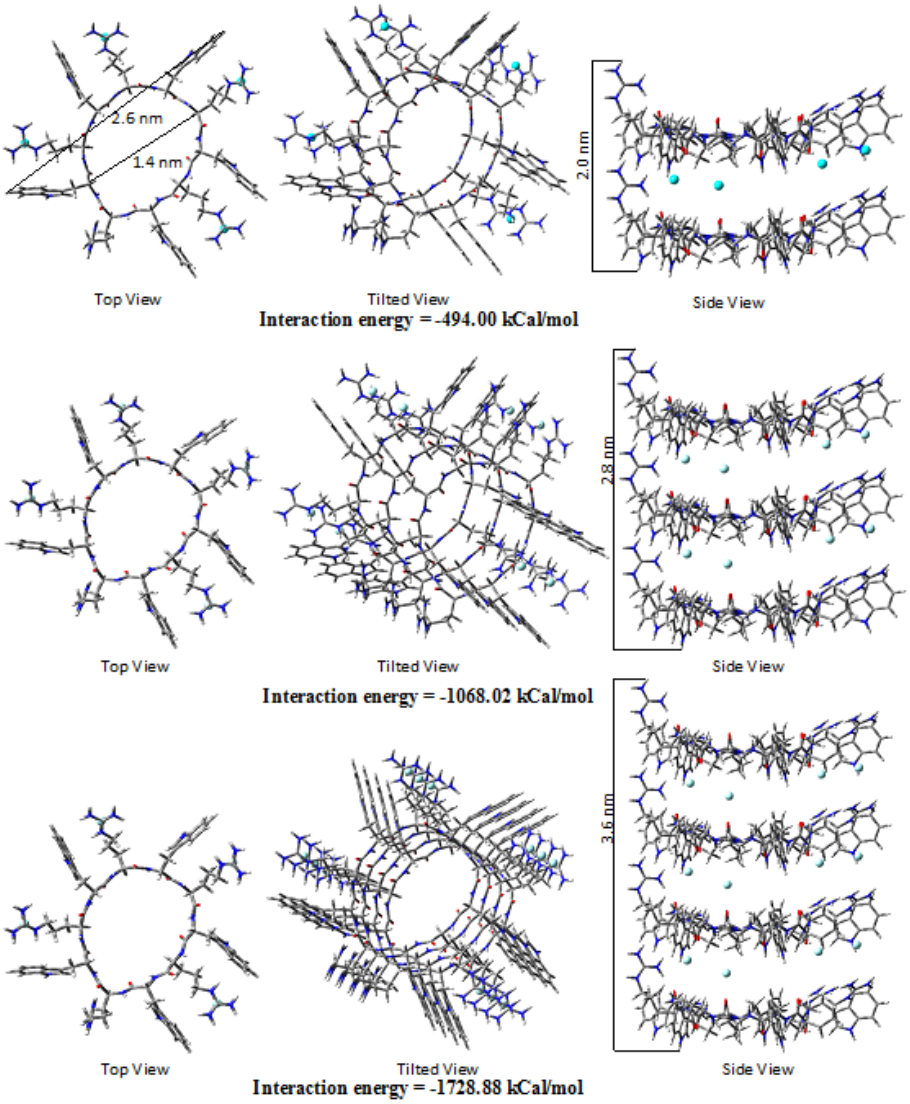

Fig. S9. Fluoride counterions-assisted self-assembly of $[WR]_5$ system.

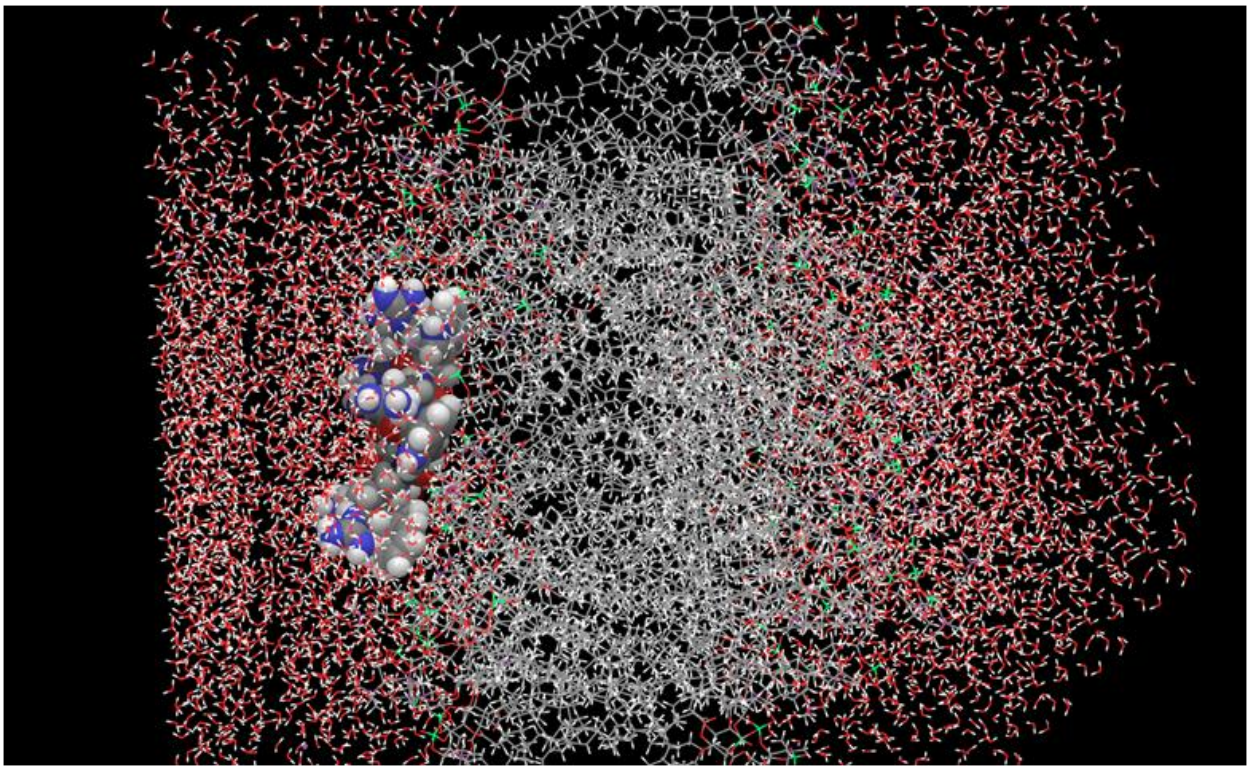

Fig. S10. Interaction of the peptide dimer with 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC) membrane bilayer.

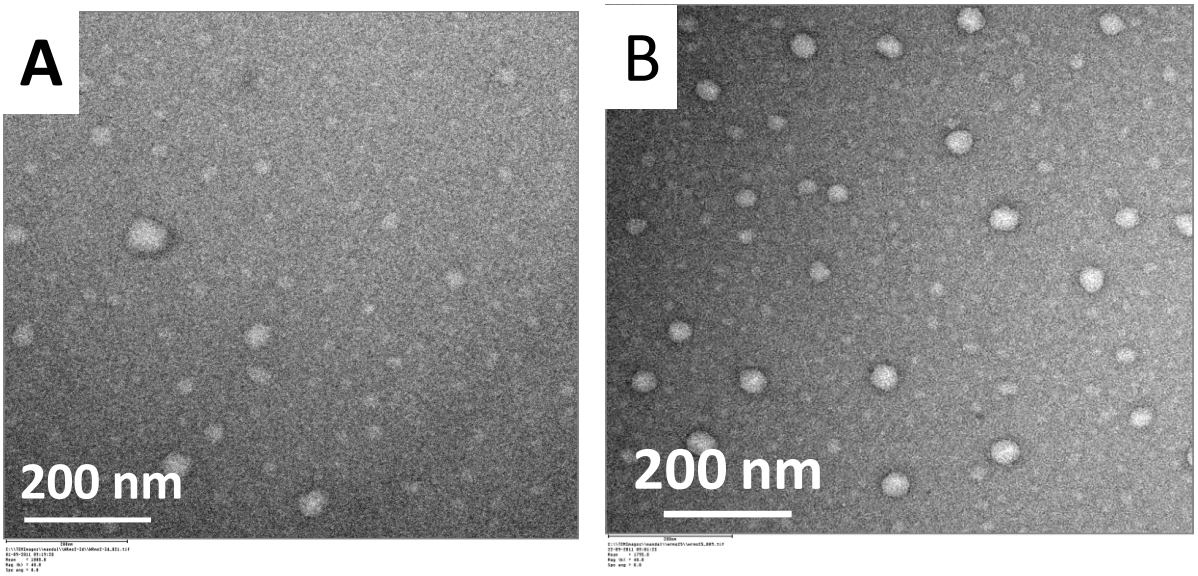

Fig. S11. Self-assembly of $[WR_{(Me)_2}]_5$ (1 mM, water) after 72 h (A) and after 20 days (B).

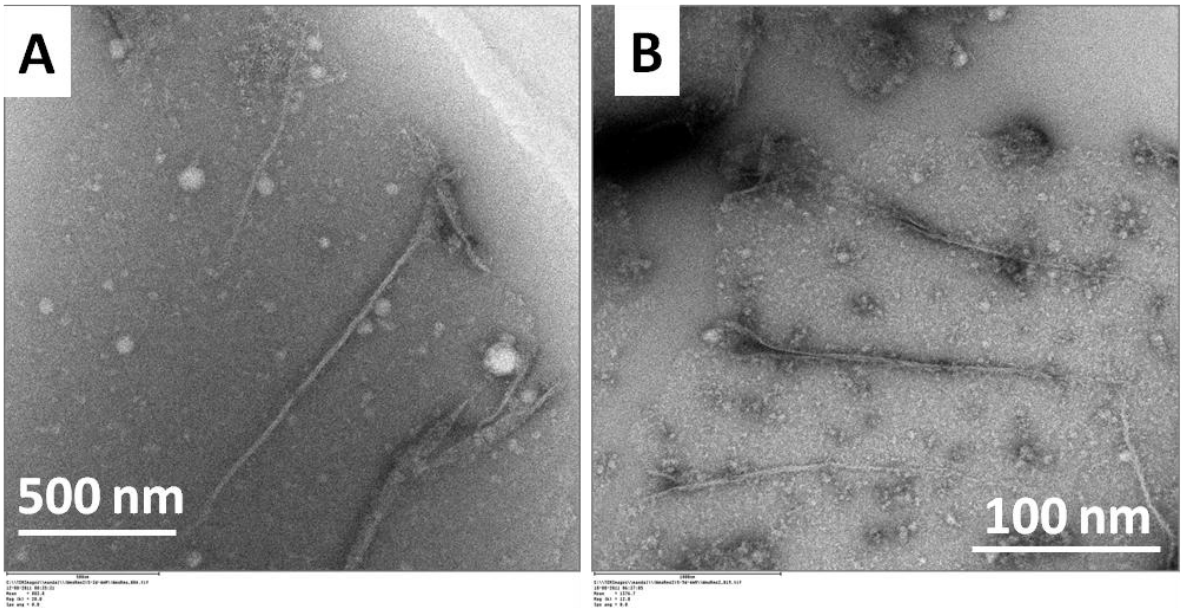

Fig. S12. TEM images of self-assembled structures of $[W_{Me}R(_{Me})_2]_5$ (4 mM, 5% DMSO in water) after 72 h (A) and after 9 days (B).

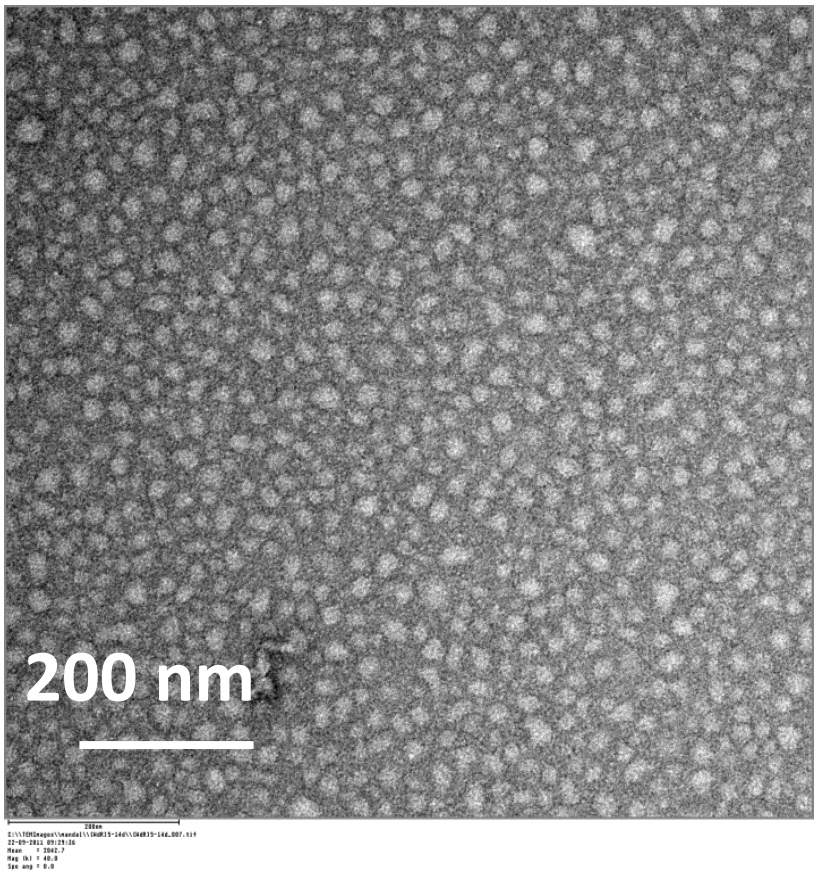

Fig. S13. TEM image of self-assembled structures of $[W\mathit{d}R]_5$ (2 mM, water) after 14 days.

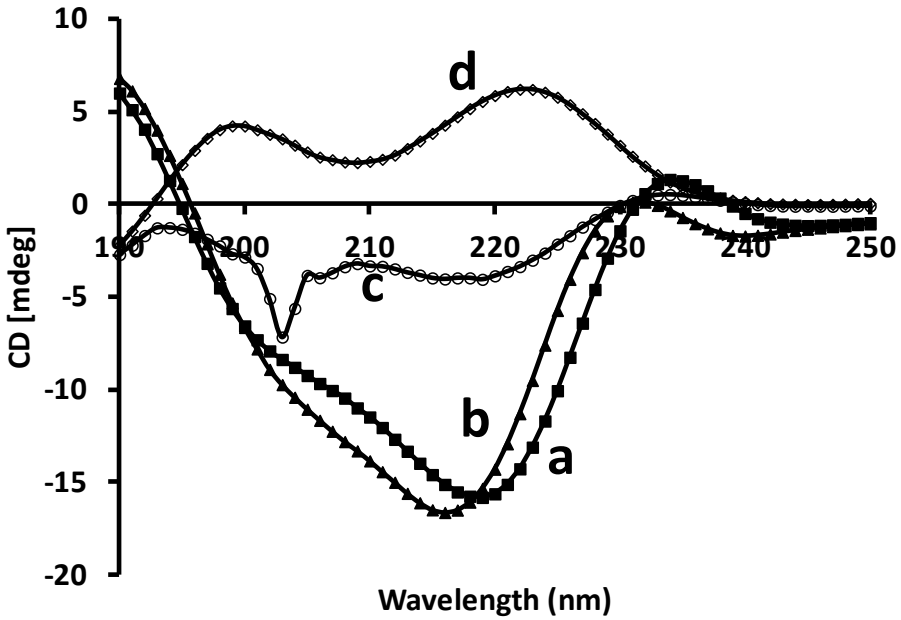

Fig. S14. CD spectra of (a) $[W_{Me}R]_5$, (b) $[WR_{(Me)_2}]_5$, (c) $[W_{Me}R_{(Me)_2}]_5$, and (d) $[Wd R]_5$ in water (100 μM) at 20 °C.

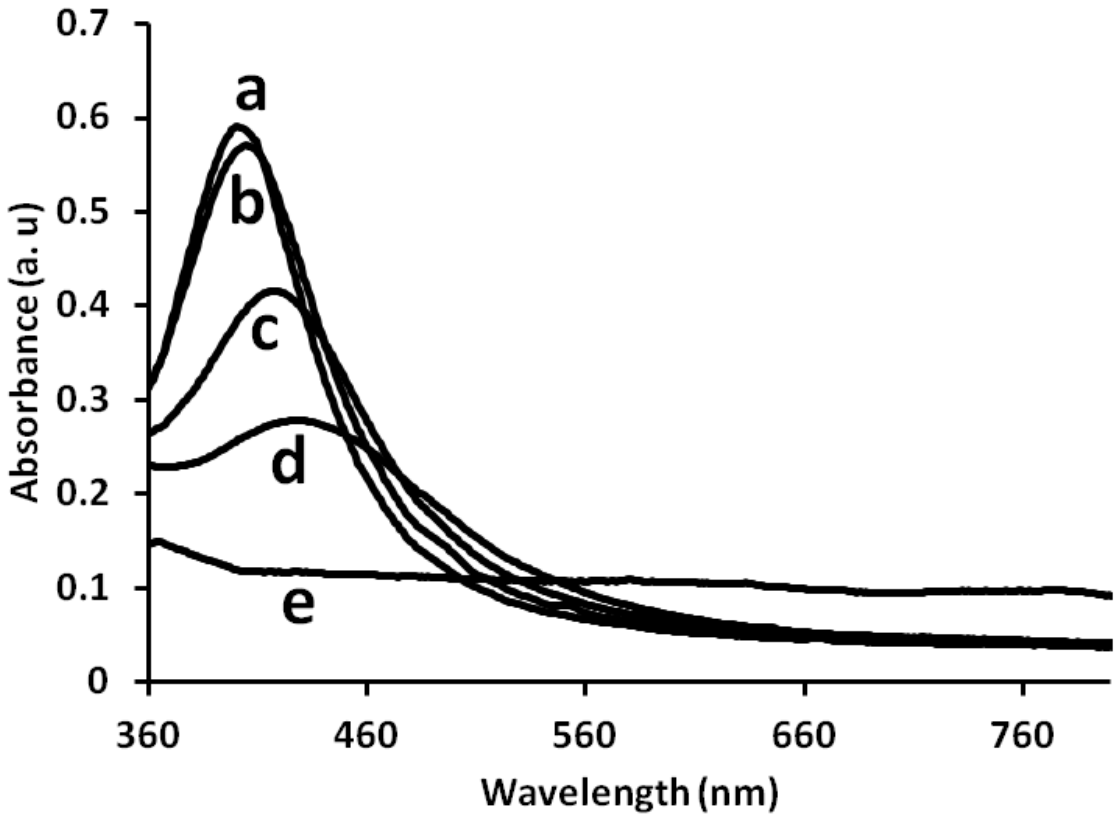

Fig. S15. Optimization of $[WR]_5$ concentration in silver nanoparticles synthesis. (a) 100 μM, (b) 200 μM, (c) 500 μM, (d) 1 mM, and (e) 0 μM.

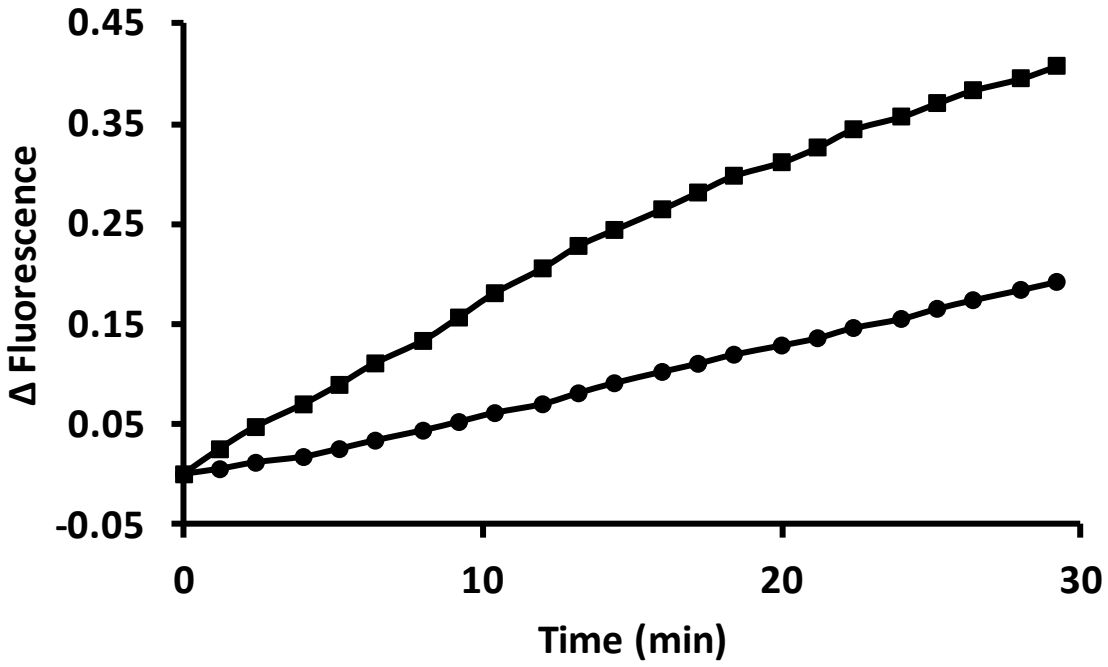

Fig. S16. Enzymatic activity of GAPDH at 37° C. (●) GAPDH enzyme in PBS, (■) GAPDH enzyme in PBS with $[WR]_5$ (100 μM).

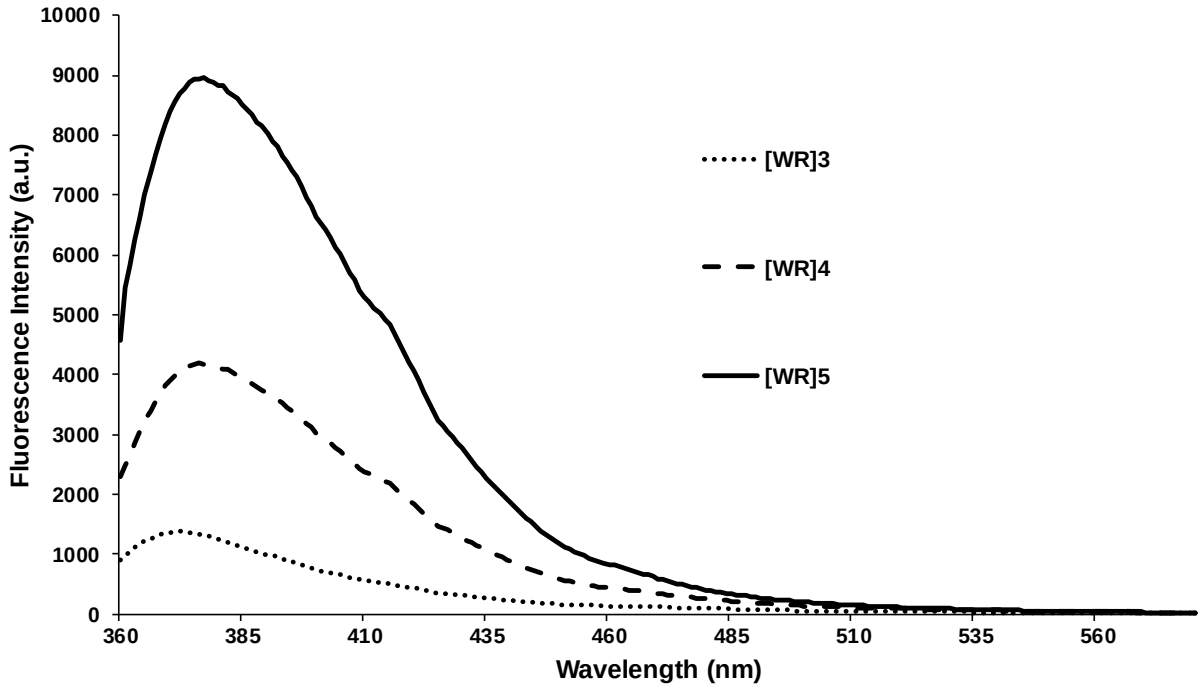

Fig S17. Fluorescence spectroscopy of $[WR]_n$ (n = 3-5) (100 μM) measured at excitation of 280 nm and emission of 360 nm.

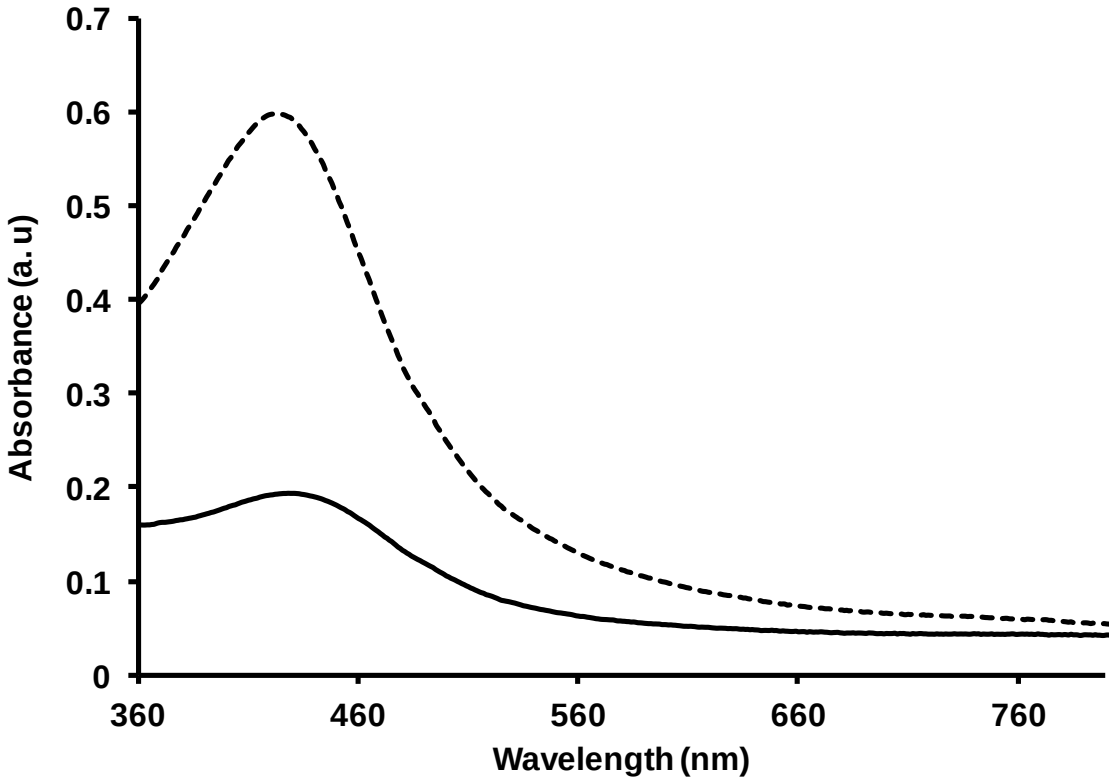

Fig. S18. Borohydride reduced silver nanoparticles in presence of cyclic $[WR]_5$ (dotted line, after one month) and linear $(WR)_5$ (solid line, after 48 h).

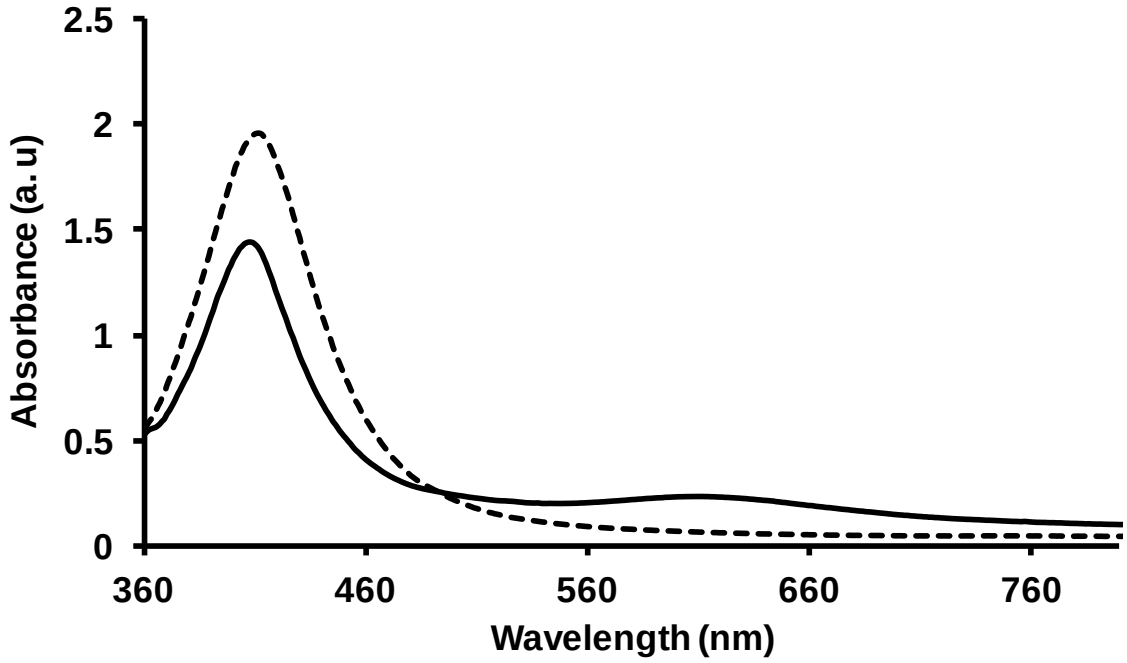

Fig. S19. Borohydride reduced silver nanoparticles in presence of CTAB (cetyl trimethylammonium bromide). UV-vis spectra of silver nanoparticles after 15 min (dotted line) and after 4 days (solid line).

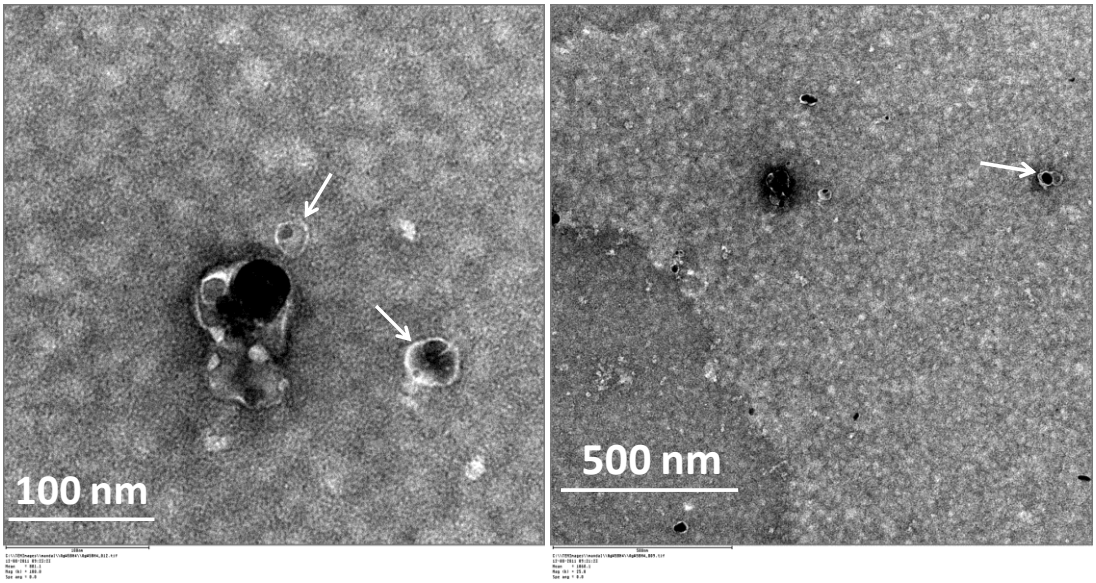

Fig. S20. TEM images of borohydride reduced silver nanoparticles in the presence of $[WR_]_5$.

Peptide coatings on silver nanoparticles are shown by arrows.

Table S1. Estimated secondary structures of $[WR]_n$ (n = 3-5).

Structure	**$[WR]_3$**	**$[WR]_4$**	**$[WR]_5$**
Helix (%)	13.1	12.9	11.5
Beta (%)	31.6	32.5	35.7
Turn (%)	12.4	12.5	12.4
Random (%)	38.8	38.7	37.6

Table S2. Morphology of different [WR] peptides.

Peptide sequence	**Solvent**	**Morphology**
$[WR]_5$	Water	Vesicle-like structures
$[WR]_5$	PBS	Vesicle-like structures
$[WR]_5$	0.02 N HCl	No specific morphology
$[W_{Me}R]_5$	Water	Tubular structures
$[W_{Me}R_{(Me)2}]_5$	Water	Few micelle like structures
$[WR_{(Me)2}]_5$	Water	Vesicle-like structures
$[W\mathit{d}R]_5$	Water	Micelle like structures