# Supporting Information

## Nanosheets and 2D-Nanonetworks by Mutually Assisted Self-Assembly of Fullerene Clusters and DNA Three-way Junctions

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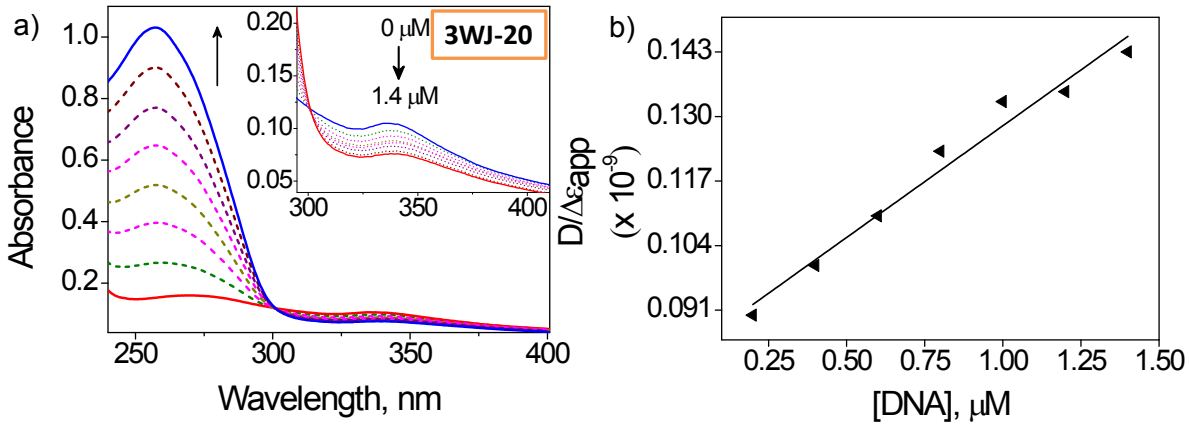


***Figure S1.*** a) Changes in the UV-Visible absorption of **F-An** nanoclusters (3 μM) upon addition of **3WJ-20** and b) corresponding half reciprocal plot with increase in [**3WJ-20**].

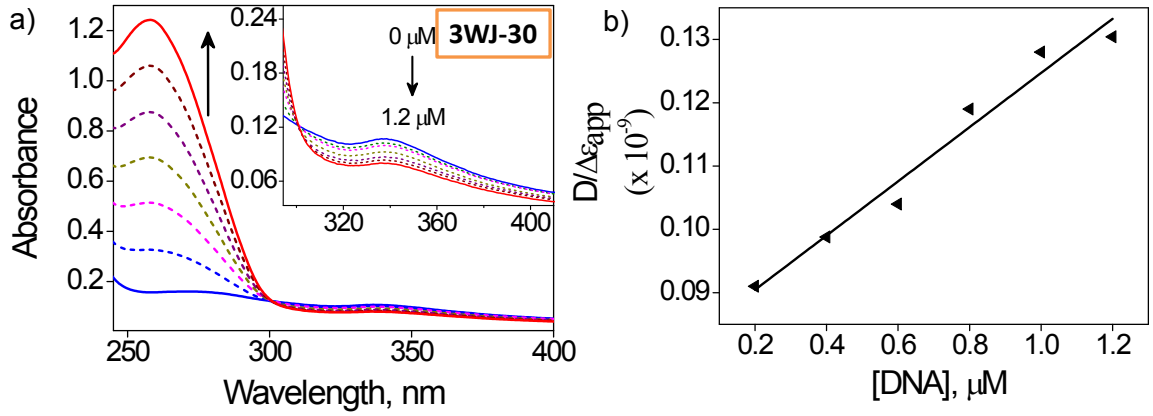


***Figure S2.*** a) Changes in the UV-Visible absorption of **F-An** nanoclusters (3 μM) upon addition of **3WJ-30** and b) corresponding half reciprocal plot with increase in [**3WJ-30**].

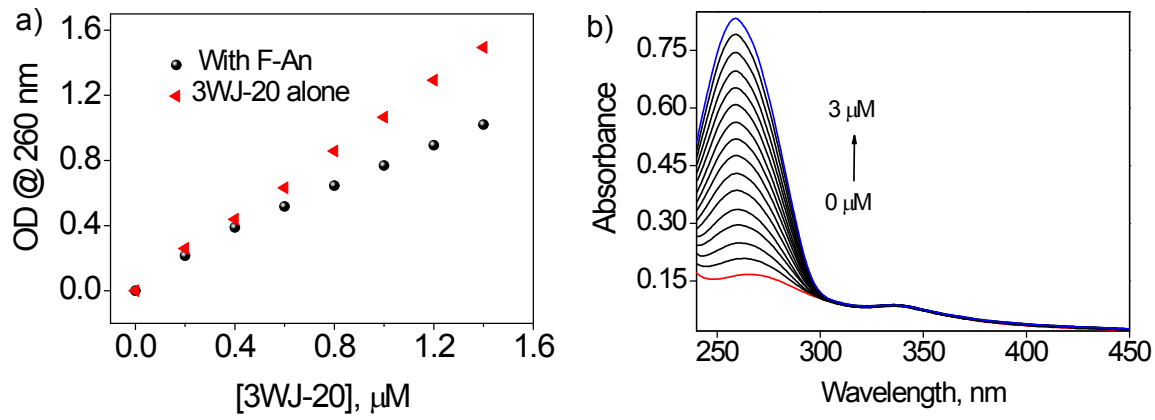


***Figure S3.*** a) Absorption changes at 260 nm in the presence and absence of **F-An** with increasing [3WJ-20]. b) Changes in the absorption of **F-An** with the sequential addition of [DNA 1].

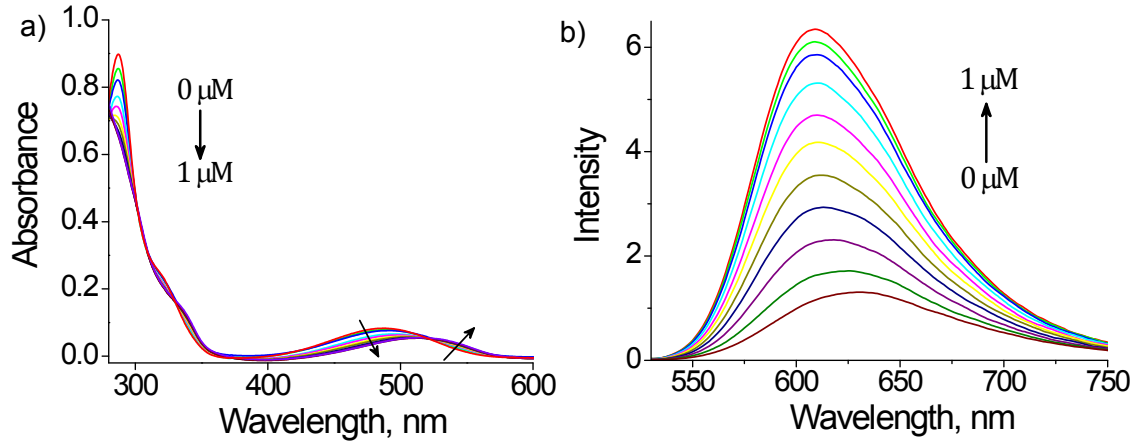


***Figure S4.*** Changes in the (a) absorption spectra and (b) emission spectra of ethidium bromide (30 μM) in the presence of increasing concentrations of **3WJ-30**. $\lambda_{ex}$, 515 nm.

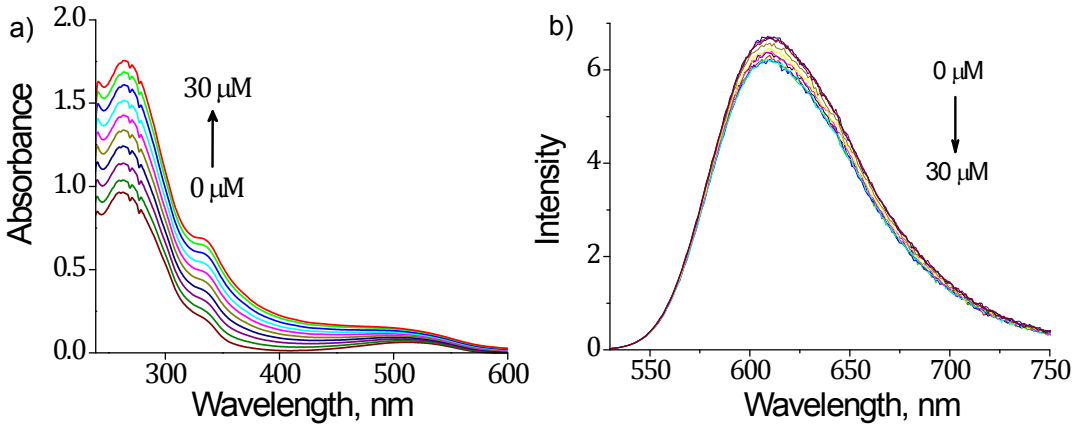


***Figure S5.*** Changes in the (a) absorption spectra and (b) emission spectra of ethidium bromide/**3WJ-30** complex (30 μM/1 μM, 1:1) in the presence of increasing concentrations of **F-An**. $\lambda_{ex}$, 515 nm.

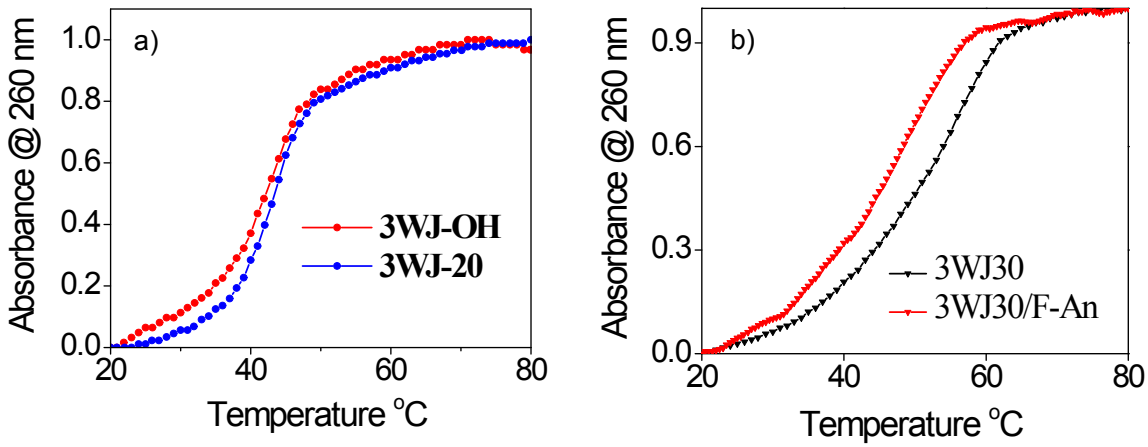


***Figure S6.*** Thermal denaturation curves for a) **3WJ-OH** (3 μM, $T_m$ = 43 °C) and **3WJ-20** (3 μM, $T_m$ = 44 °C) b) **3WJ-30** (3 μM, $T_m$ = 55 °C) and **3WJ-30**/**F-An** (1:1, 1 μM each, $T_m$ = 48 °C), absorbance monitored at 260 nm (10% DMSO-PBS, 10 mM phosphate buffer, 100 mM NaCl, pH=7.4).

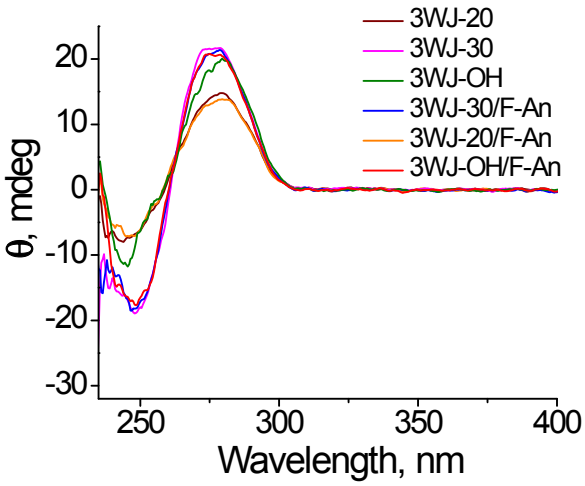


***Figure S7.*** The circular dichroism spectra of **3WJ-20**, **3WJ-30**, **3WJ-OH**, **3WJ-20/F-An, 3WJ-30/F-An** and, **3WJ-OH/F-An** ($c$ = 3 μM each)

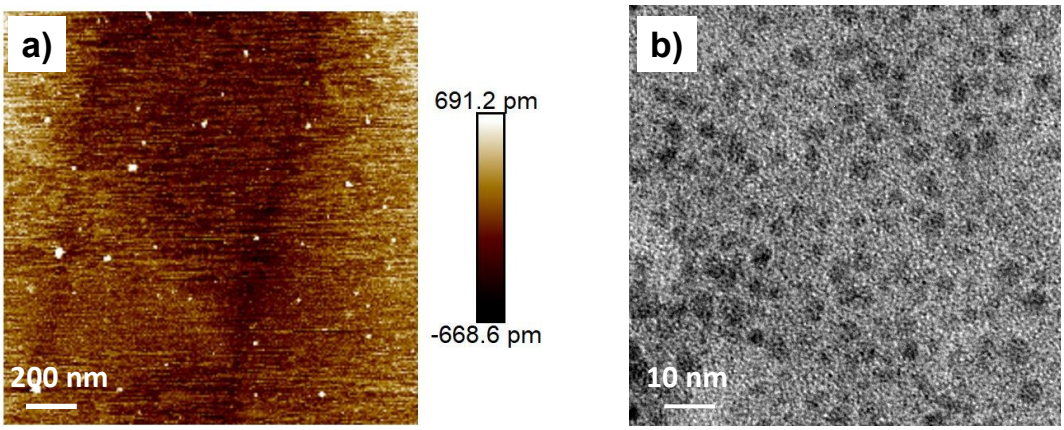


***Figure S8.*** a) AFM and b) TEM image of **F-An** clusters.

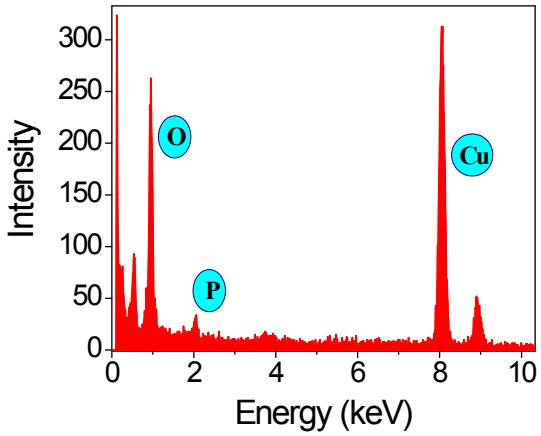


***Figure S9.*** EDAX analysis of **3WJ-30/F-An** (1:1) nanosheets showing corresponding peaks arising from the phosphorous atoms of DNA backbone.

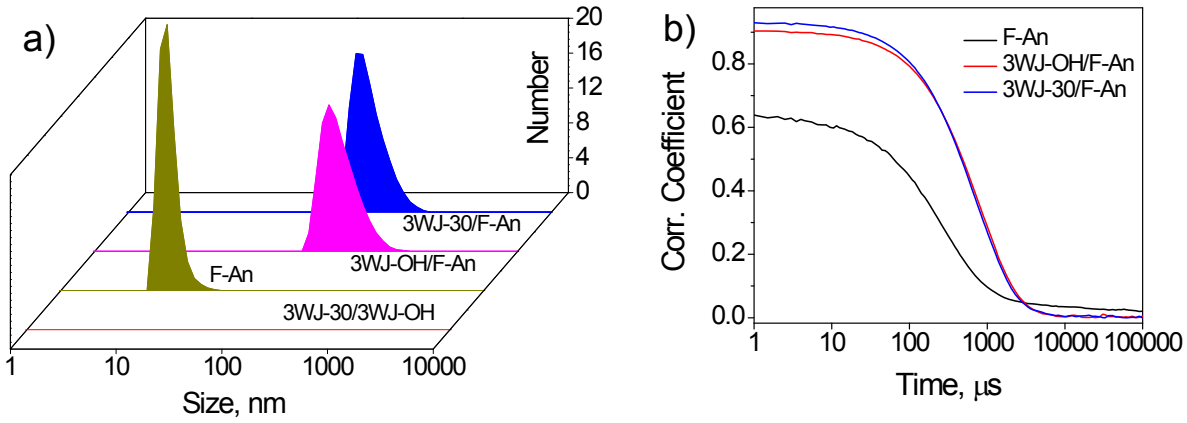


***Figure S10.*** a) The number size distribution of **3WJ-30/3WJ-OH**, **F-An**, **3WJ-30/F-An** and **3WJ-OH/F-An** obtained from DLS measurements. b) Corresponding correlogram plots.

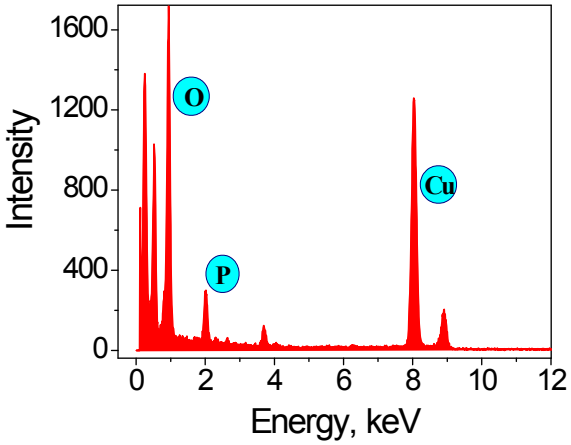


***Figure S11.*** EDAX analysis of **3WJ-OH/F-An** (1:1) entangled 2D-nanonetwork showing corresponding peaks arising from the phosphorous atoms of DNA backbone.

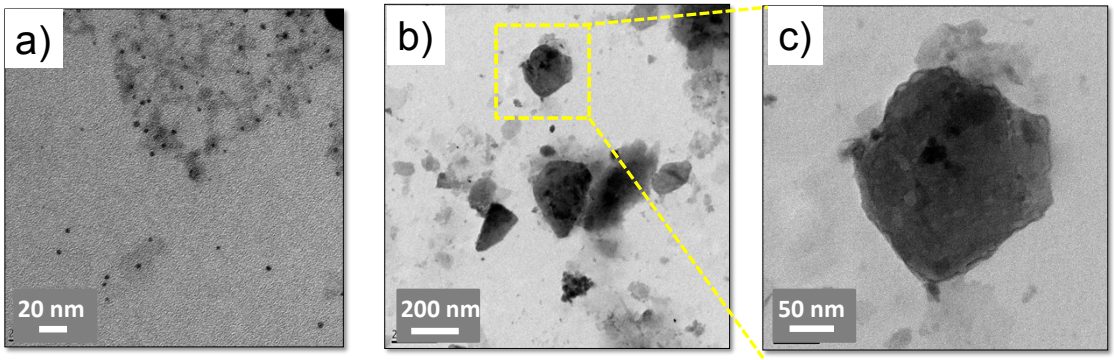


***Figure S12.*** TEM image of a) **3WJ-OH/AgNCs** b) **3WJ-OH/F-An** stabilized **AgNCs** and c) Zoomed TEM image of selected portion showing realigned nanosheet structure after the formation of overhang templated **AgNCs**.

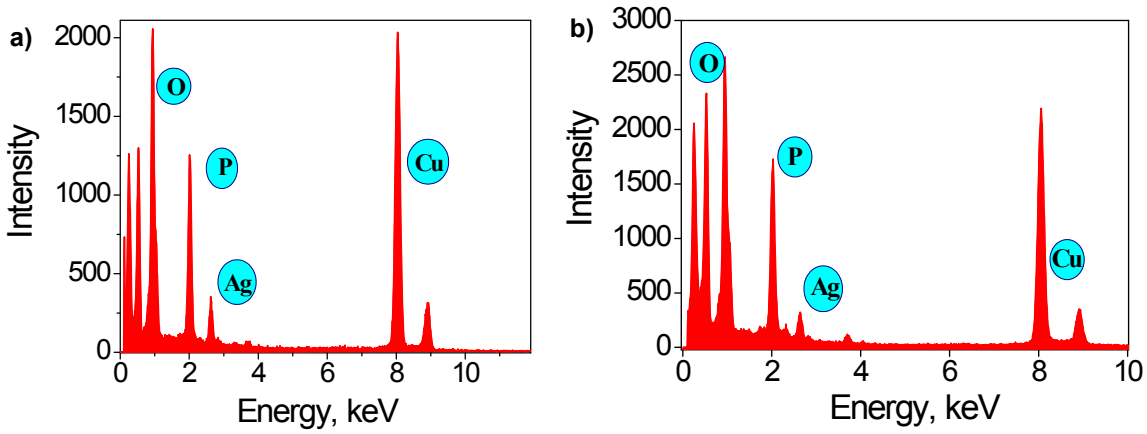


***Figure S13.*** EDAX analysis of a) **3WJ-OH/AgNCs** and b) **3WJ-OH/F-An** nanonetwork embedded **AgNCs** showing corresponding peaks arising from the phosphorous atoms of DNA backbone and silver atoms from **AgNCs**.

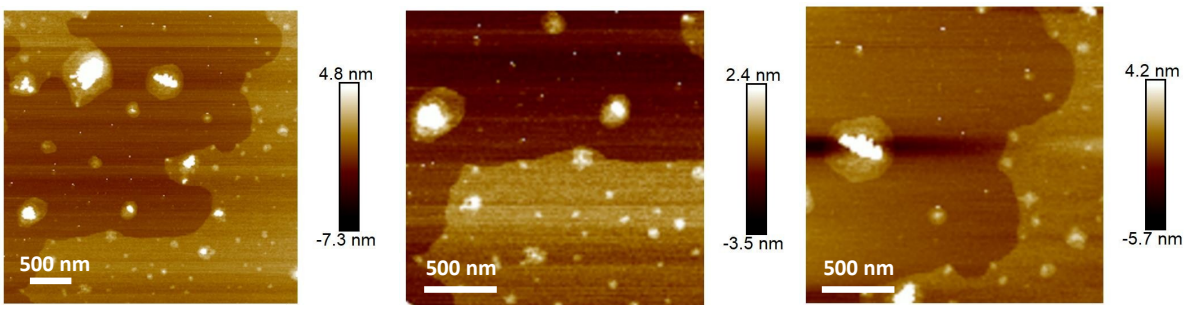


***Figure S14.*** Additional AFM images of **3WJ-30/F-An** nanosheets.

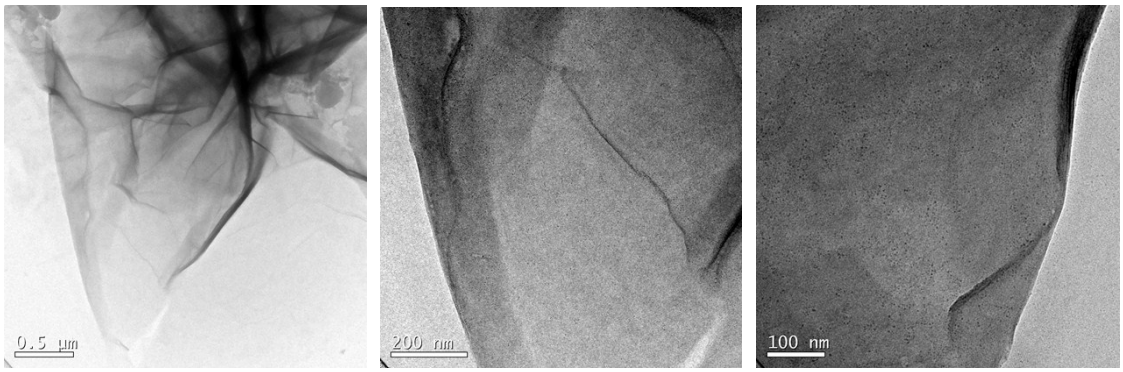


***Figure S15.*** Additional TEM images of **3WJ-30/F-An** nanosheets with different magnification.