

# **Supporting Information's**

## S1

### Kinetic model equations

#### Zero-Order Kinetics

$$C = C_0 - Kt$$

where C: drug concentration at time t, C<sub>0</sub> represent initial concentration, and K is zero order

#### First-Order Kinetics

$$\log C = \log C_0 - \frac{K_t}{2.303} t$$

where C: drug concentration at time t, C<sub>0</sub> represent initial concentration, and K is first order rate constant

#### Higuchi Model (Diffusion-Controlled Release)

$$Q = K_H t^{1/2}$$

where Q: cumulative amount of drug released per unit area at time t, K<sub>H</sub>: Higuchi dissolution constant

#### Korsmeyer-Peppas Model

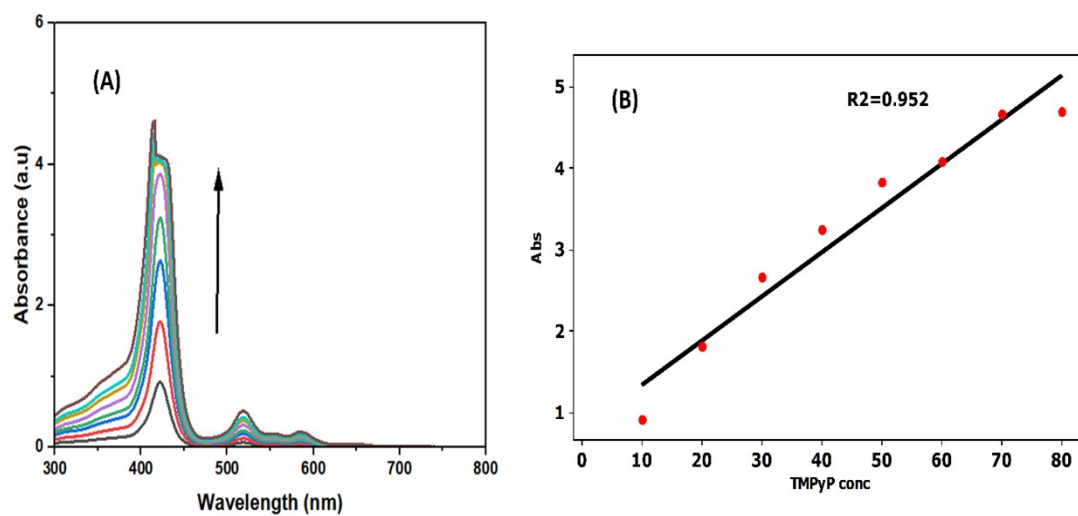
$$\frac{M_t}{M_\infty} = Kt^n$$

Where M<sub>t</sub>: amount of drug released at time t, M<sub>∞</sub> : total amount of drug released at infinite time, and n: release exponent

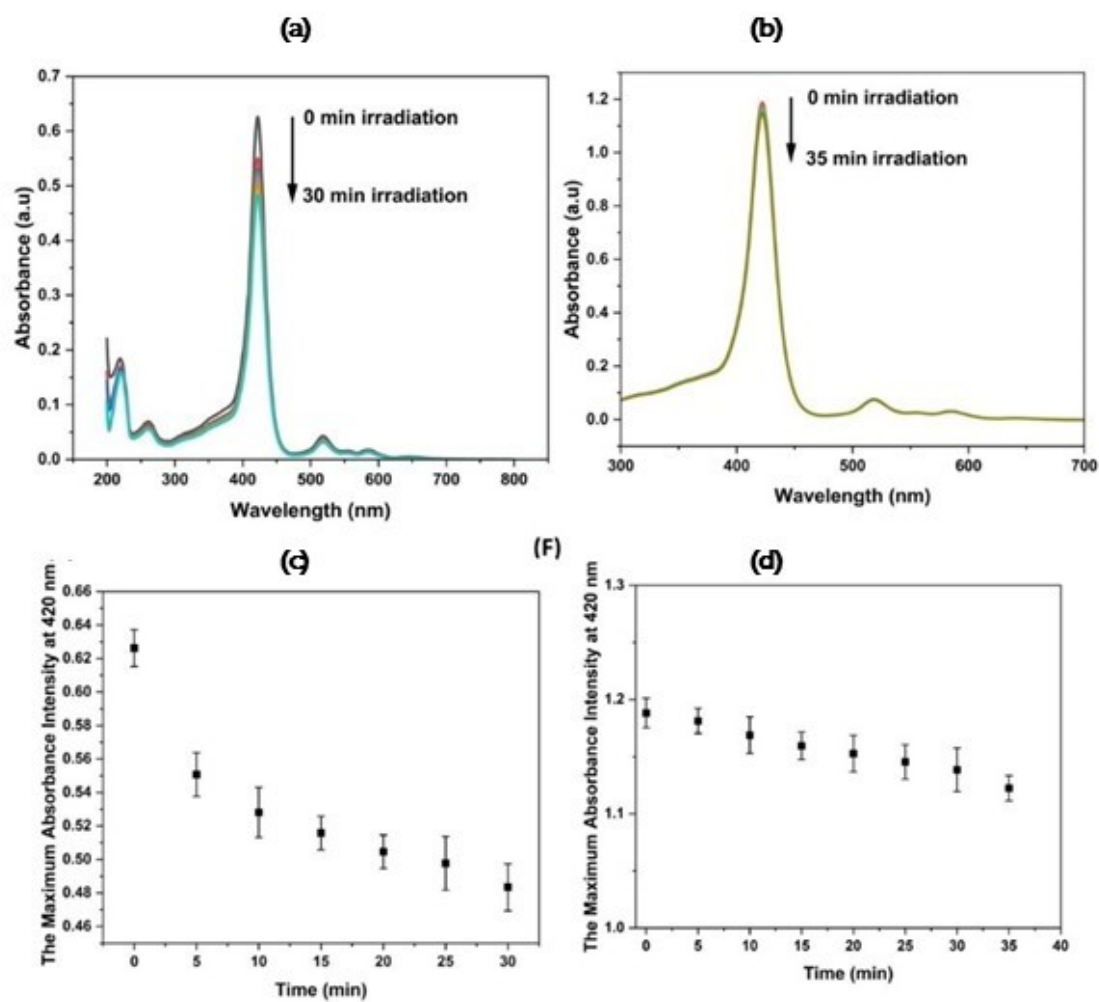
#### Hixson–Crowell Cube Root Model

$$W_0^{1/3} - W_t^{1/3} = K_{HC} t$$

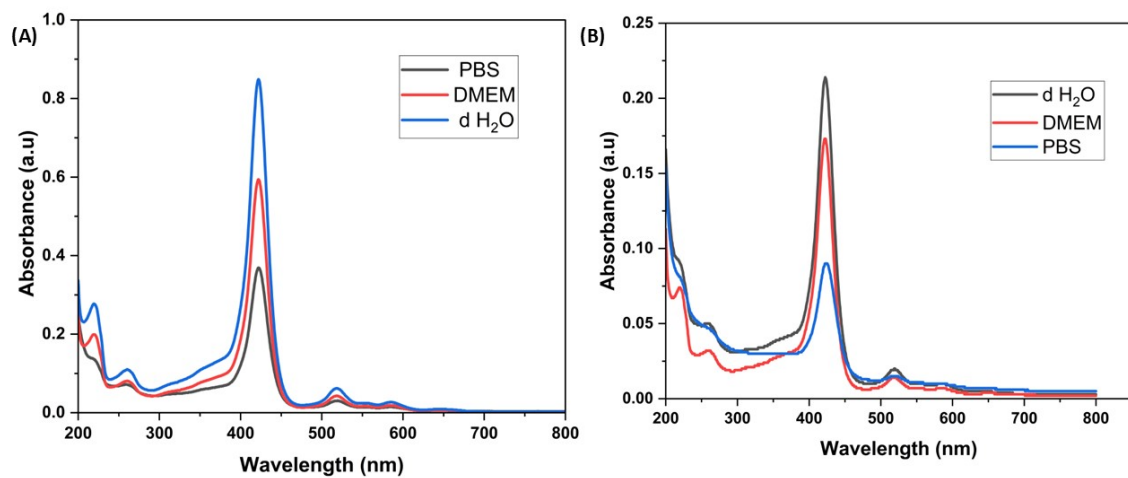
Where W<sub>0</sub>: initial amount of drug, W<sub>t</sub> : amount of drug remaining at time t, k<sub>HC</sub>: Hixson–Crowell release constant, t time



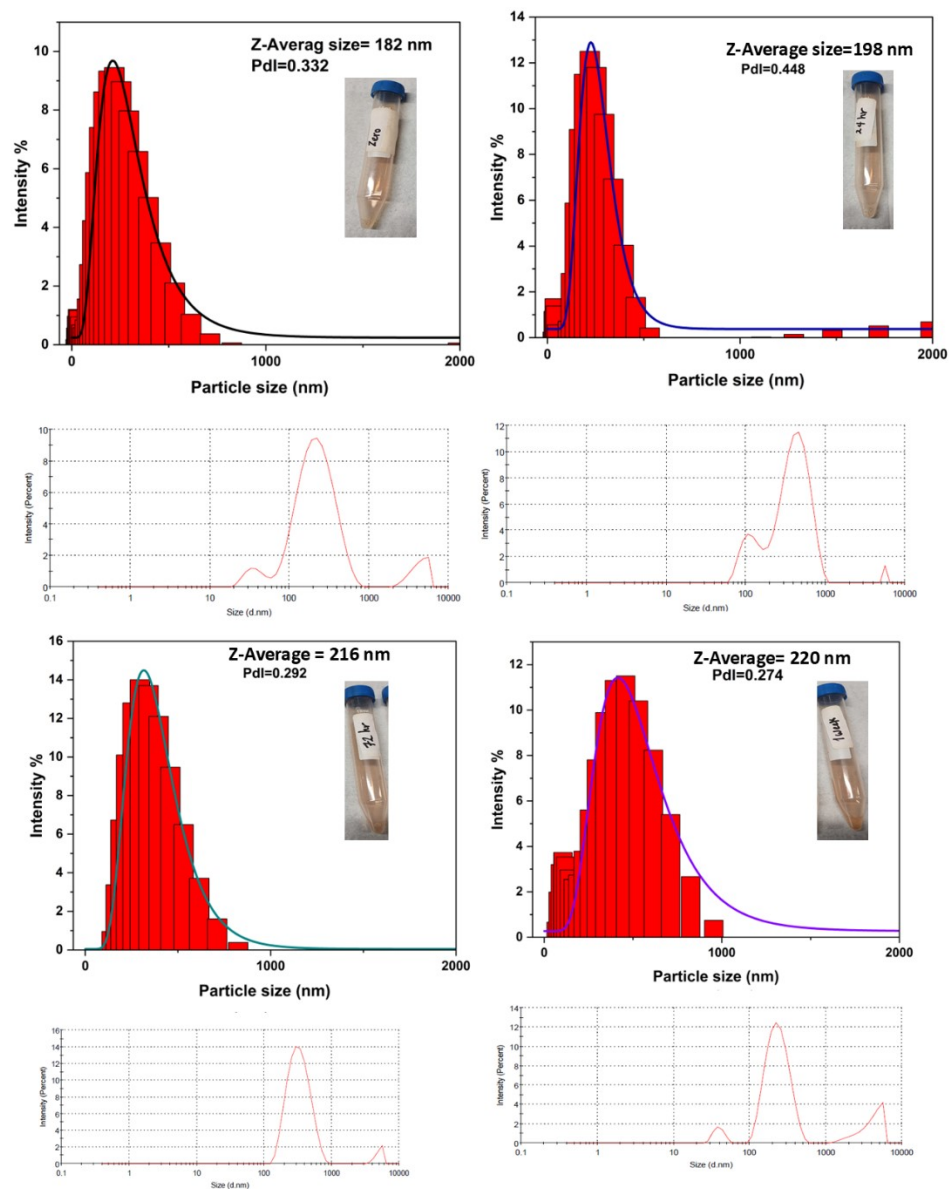
**Figure S1.** Calibration curve of TMPyP (a) UV spectra, and (B) plot the absorbance against different concentration of TMPyP.



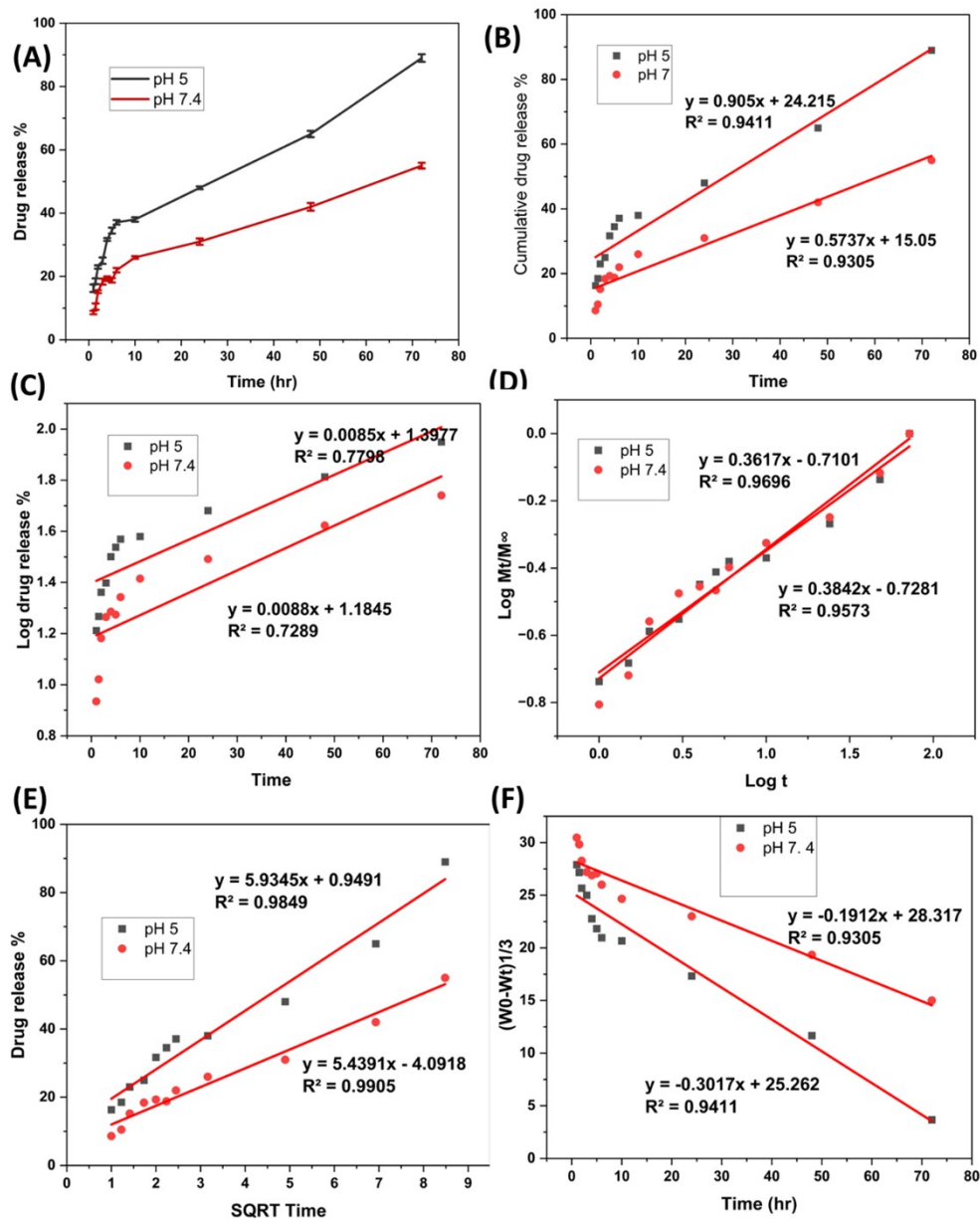
**Figure S2.** Photostability of (a) TMPyP and (b) MSNCDs@TMPyP under low-intensity irradiation as a function of time



**Figure S3.** The stability of (A)TMPyP, and (B) MSNCDs-FA@TMPyP at the indicated solvents.



**Figure S4.** DLS analysis of MSNCDs for stability test at different times (0-1 week).



**Figure S5.** (A) Drug Release at pH 5, and pH 7.4, (B-F) Kinetic drug release models zero, first order, Krosmyer peppas, Higuchi, and Hixson–Crowell Cube Root Model.