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Double-crosslinkable poly(urethane)-based hydrogels relying on supramolecular interactions and light-initiated polymerization: promising tools for advanced applications in drug delivery.

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Physico-chemical characterization of HHP407

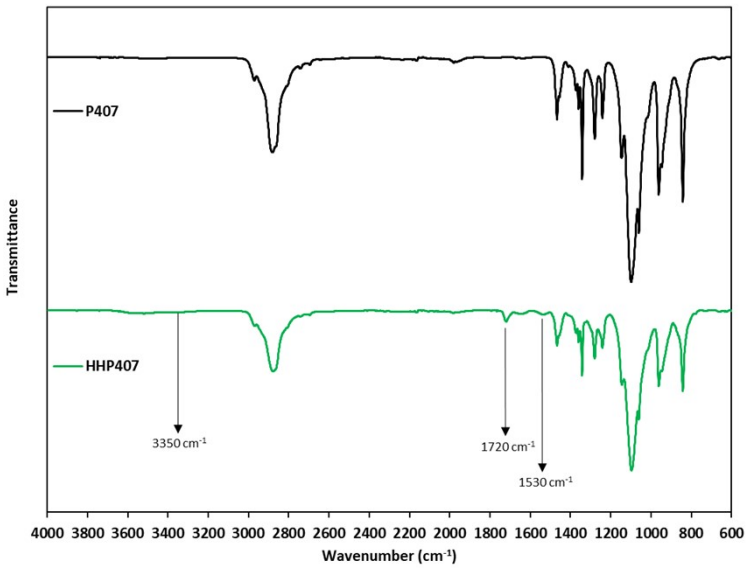

Fig. S1 ATR-FTIR spectra of P407 (black continuous line) and HHP407 (green continuous line). The typical peaks of urethane domains are indicated by vertical black arrows at 3350, 1720 and 1530 cm^{-1}.

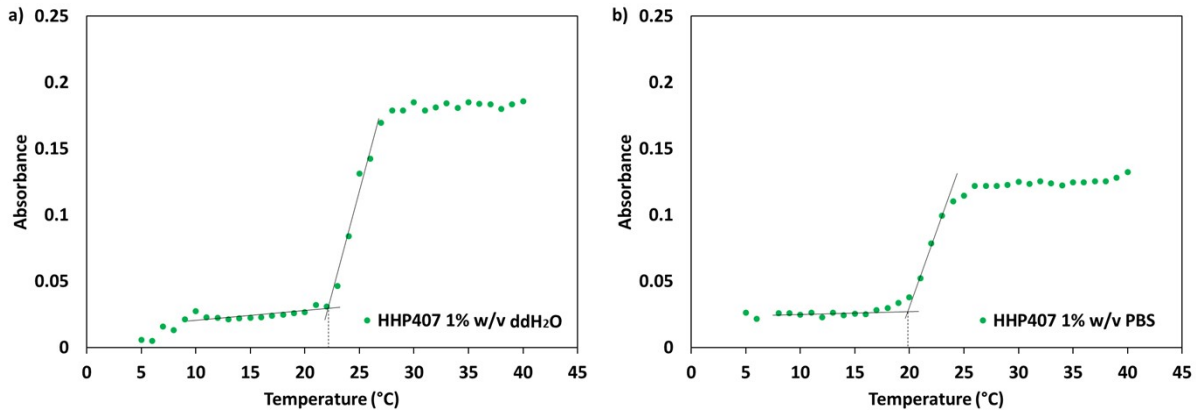

Fig. S2 CMT curves for HHP407 at 1% w/v concentration in **a)** ddH_2O and **b)** PBS representing the measured absorbance at 356 nm as a function of temperature. CMT values are indicated by black vertical dotted lines.

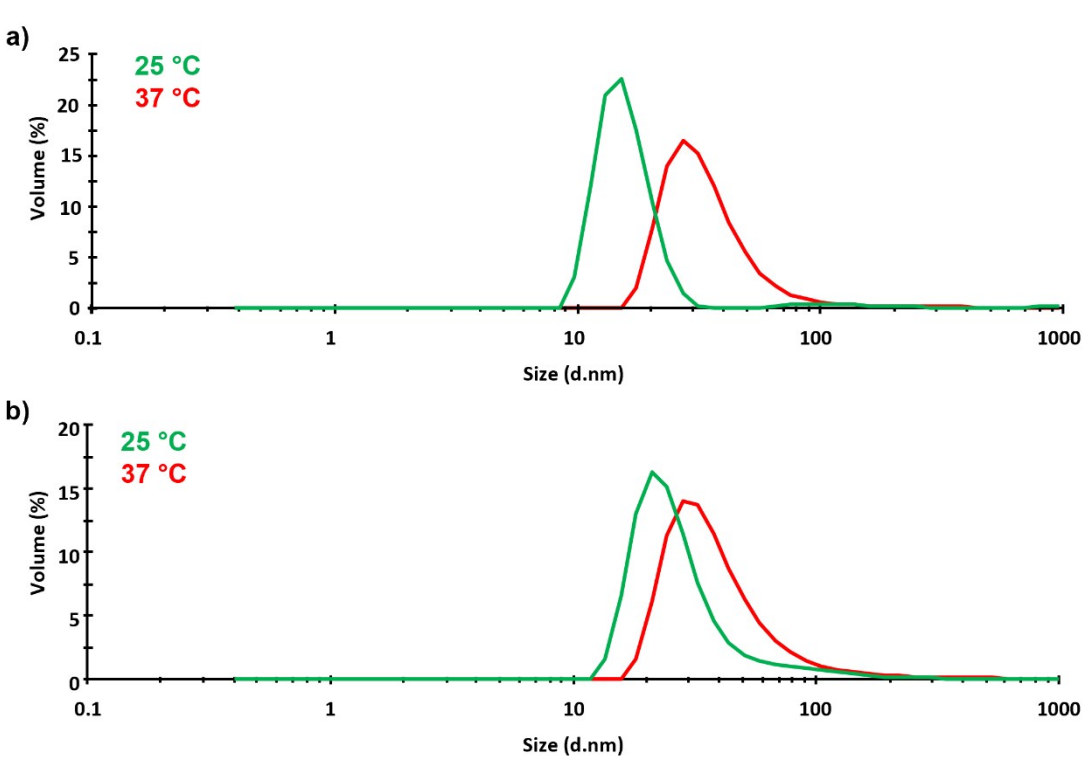

Fig. S3 DLS volume patterns of micelle hydrodynamic diameter measured at 25 °C (green) and 37 °C (red) for HHP407 at 1% w/v concentration in **a)** ddH_2O and **b)** PBS.

Characterization of HHP407-CD SM complexes

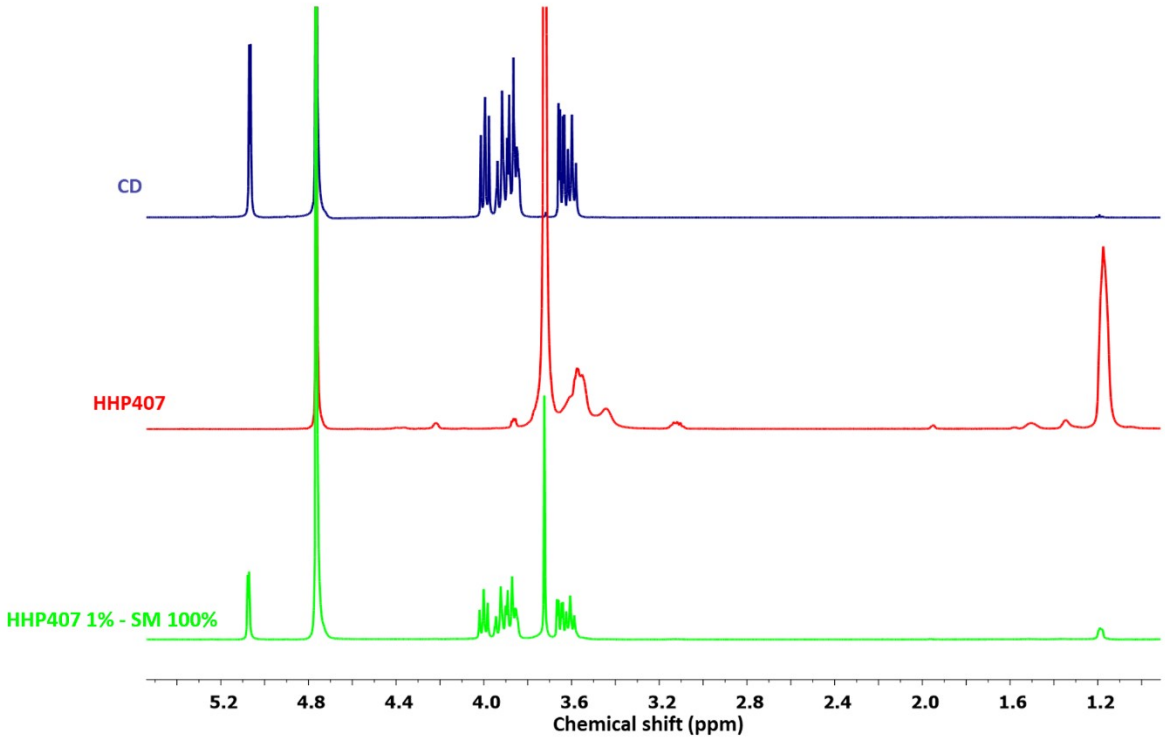

Fig. S4 ^{1}H NMR spectra of CDs (blue), HHP407 (red) and HHP407 1% - SM 100% (green). The simultaneous presence of CDs and PEU in the produced SM powder was confirmed by the appearance of their typical resonance bands in HHP407 1% - SM 100% spectrum.

Biological characterization of SM hydrogels based on HHP407 and CDs

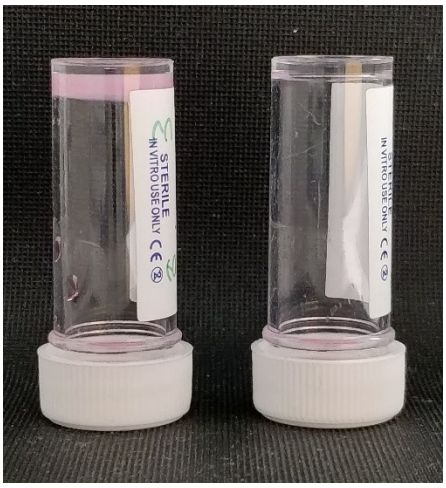

Fig. S5 Appearance of HHP407 5% - CD 8% UV (left) and HHP407 5% - CD 8% (right) samples after 24 hours of incubation with DMEM according to the ISO 10993-5 guidelines. The higher stability of photo-crosslinked systems is demonstrated by the integrity of the hydrogel on the left with respect to the one on the right, which instead appeared completely solubilized.

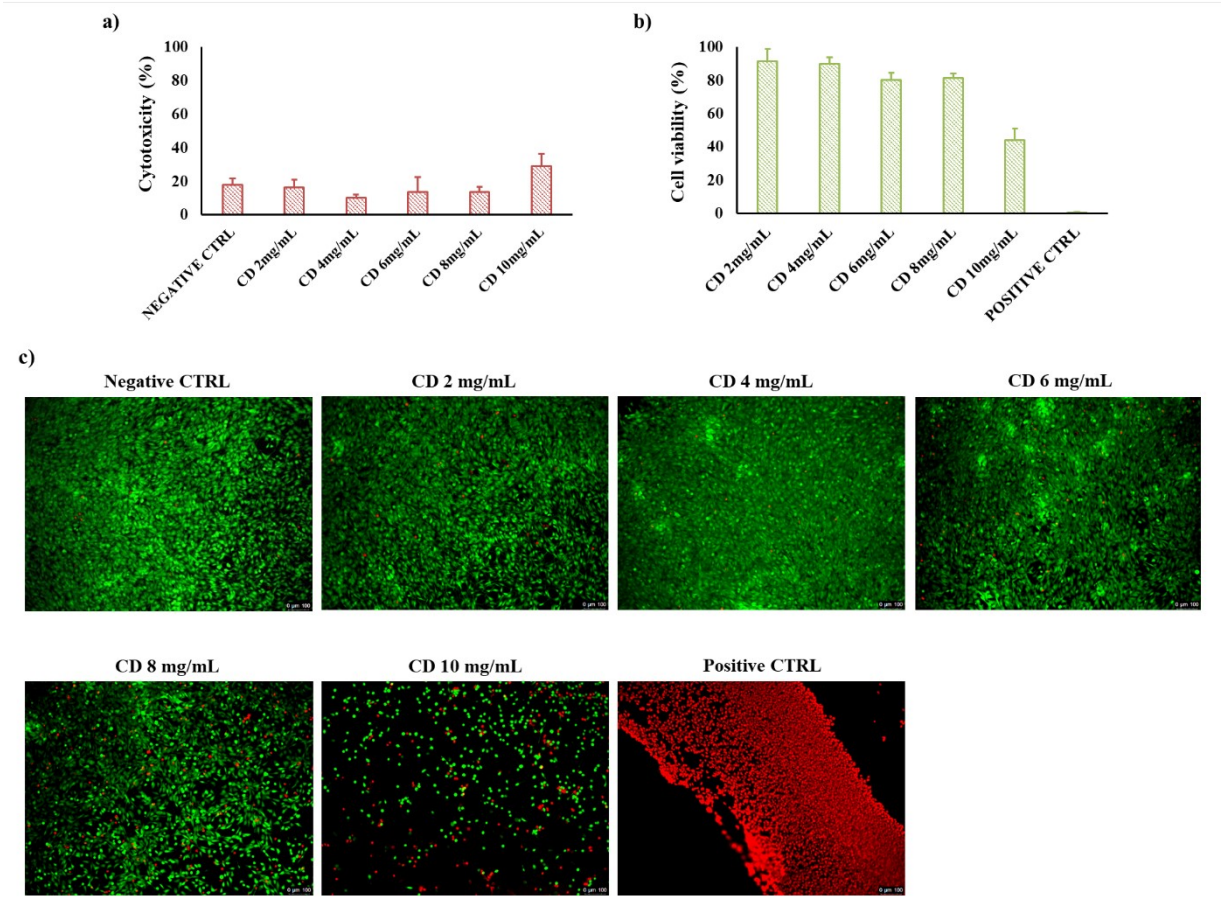

Fig. S6 a) Cytotoxicity and **b)** cell viability assessed through CytoTox-ONE™ and CellTiter-Blue assays, respectively, tested on NIH-3T3 murine fibroblasts treated for 24h with cyclodextrin-based solutions with concentration in the range 0 – 10 mg ml^{-1}. **c)** Live&Dead images obtained through a fluorescence microscope. Live and dead cells are stained in green and red, respectively.

Physical and mechanical characterization of curcumin-loaded SM hydrogels

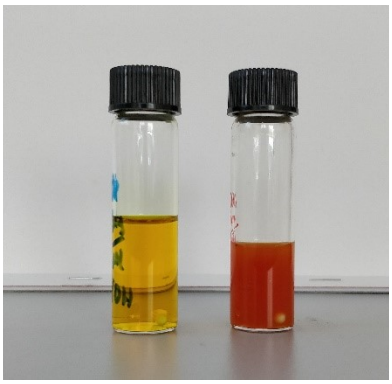

Fig. S7 Visual comparison among a Cur solution (1 mg ml^{-1}) in ethanol (left) and a Cur suspension (1 mg ml^{-1}) in a solution of CDs at 14% w/v concentration in PBS/LAP (right).

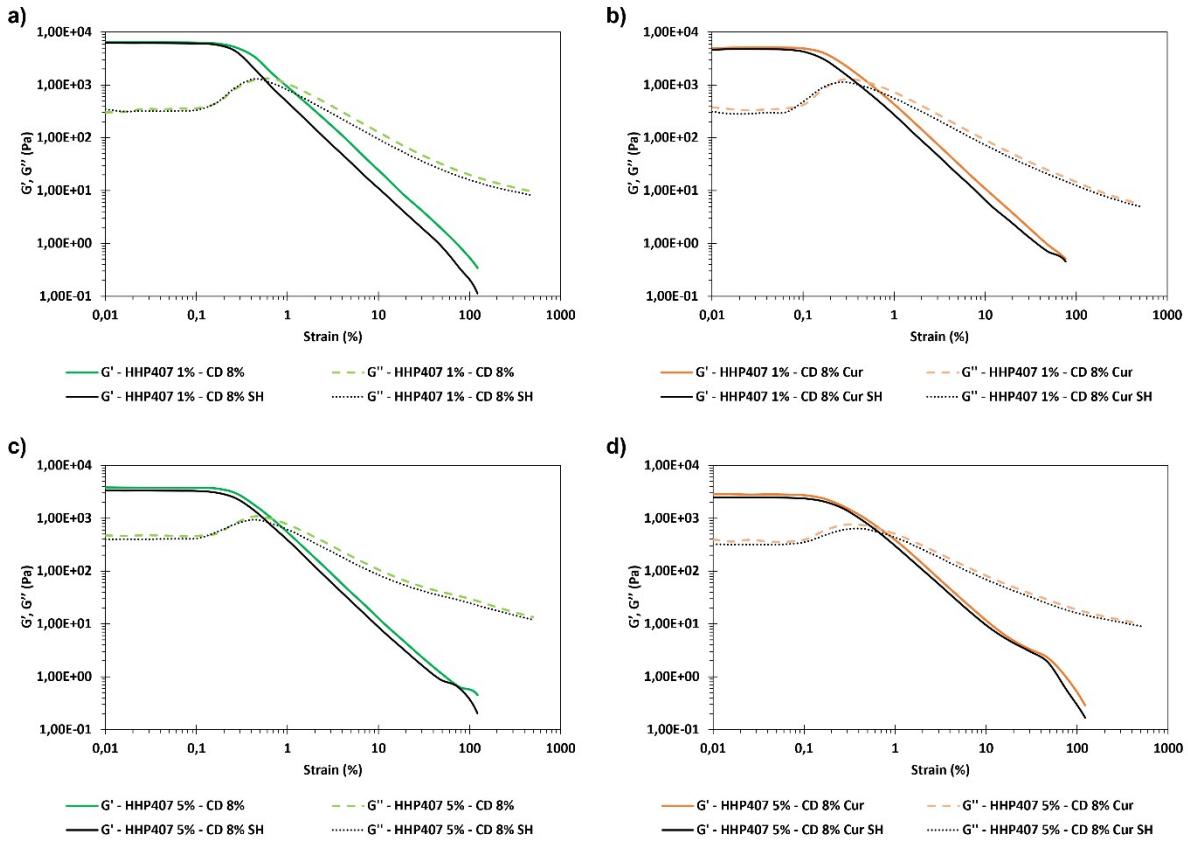

Fig. S8 G' and G" trends as a function of applied strain at 37 °C for the as prepared formulations and the same parameters measured after sample recovery in quiescent state for 15 minutes at 37 °C (i.e., after complete rupture of the gel network at 500% deformation, the sample was kept in quiescent state between the rheometer's plates for 15 min. at 37 °C and then analyzed again). G' and G'' trends of self-healed samples were identified adding SH (i.e., self-healed) at the end of the sample acronym. **a)** HHP407 1% - CD 8% (green) and HHP407 1% - CD 8% SH (black), **b)** HHP407 1% - CD 8% Cur (orange) and HHP407 1% - CD 8% Cur SH (black), **c)** HHP407 5% - CD 8% (green) and HHP407 5% - CD 8% SH (black), and **d)** HHP407 5% - CD 8% Cur (orange) and HHP407 5% - CD 8% Cur SH (black).

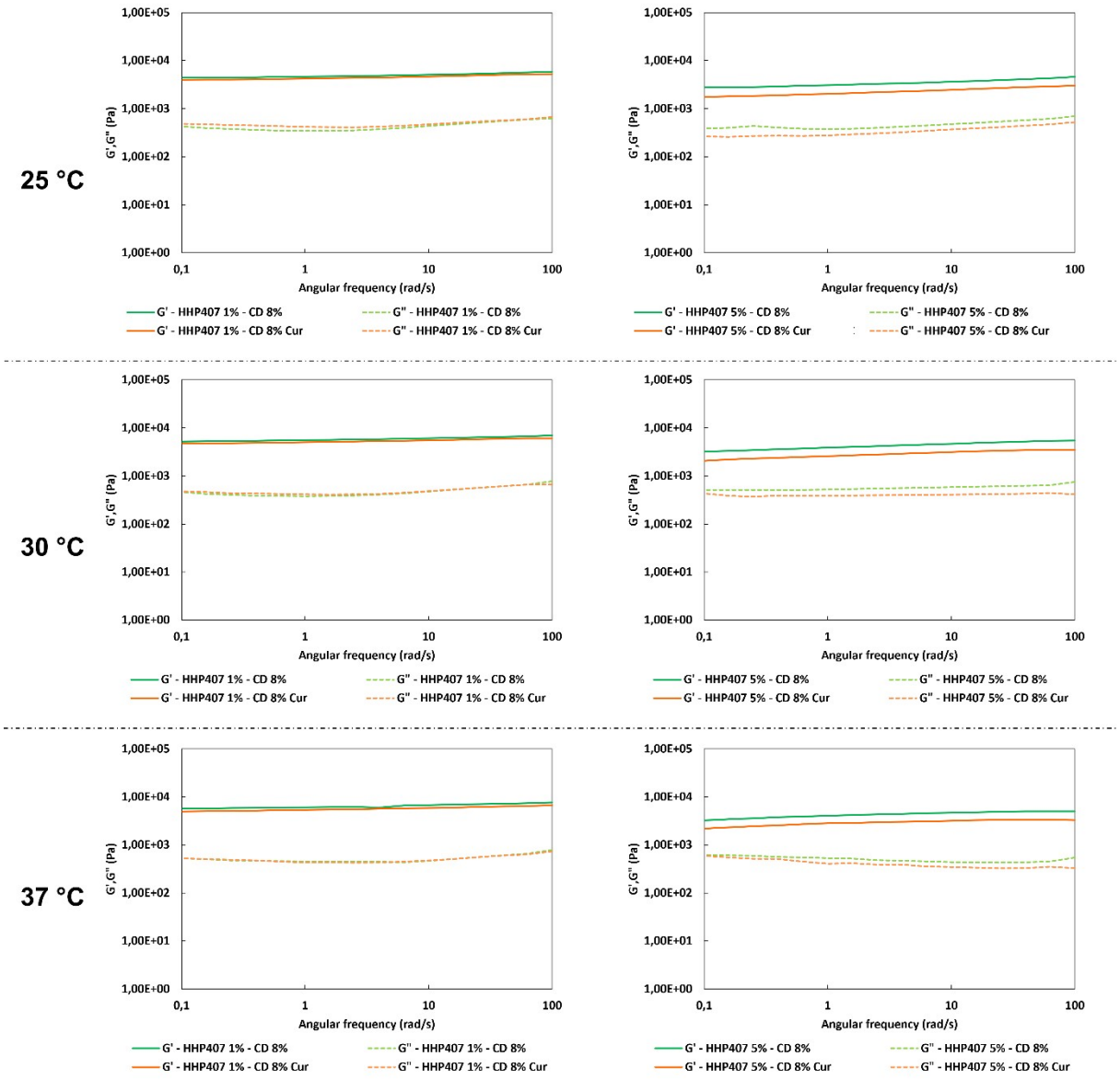

Fig. S9 G' (continuous lines) and G" (dashed lines) trends as a function of applied angular frequency at 25, 30 and 37 °C for HHP407 1% - CD 8%, and HHP407 5% - CD 8% as such (green) and containing Cur at 570 µg ml^{-1} (orange).

Release profiles of Cur encapsulated within HHP407-based hydrogels

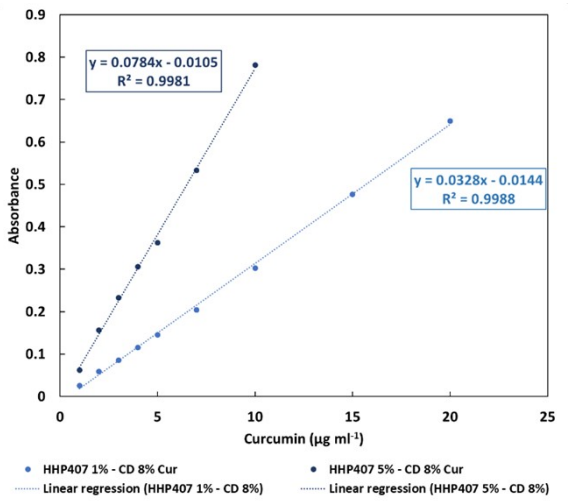

Fig. S10 Calibration curves showing the absorbance of standard samples as a function of Cur concentration. Standard samples were prepared starting from a stock solution obtained through dissolution of HHP407 1% - CD 8% Cur (light blue) and HHP407 1% - CD 8% Cur (blue) at a final Cur concentration of 100 µg ml^{-1}. Linear regressions are also reported with the resulting equations, which showed a good fitting.