

**Orally dual-targeted astaxanthin nanoparticles as the novel dietary supplement  
for alleviating hepatocyte oxidative stress**

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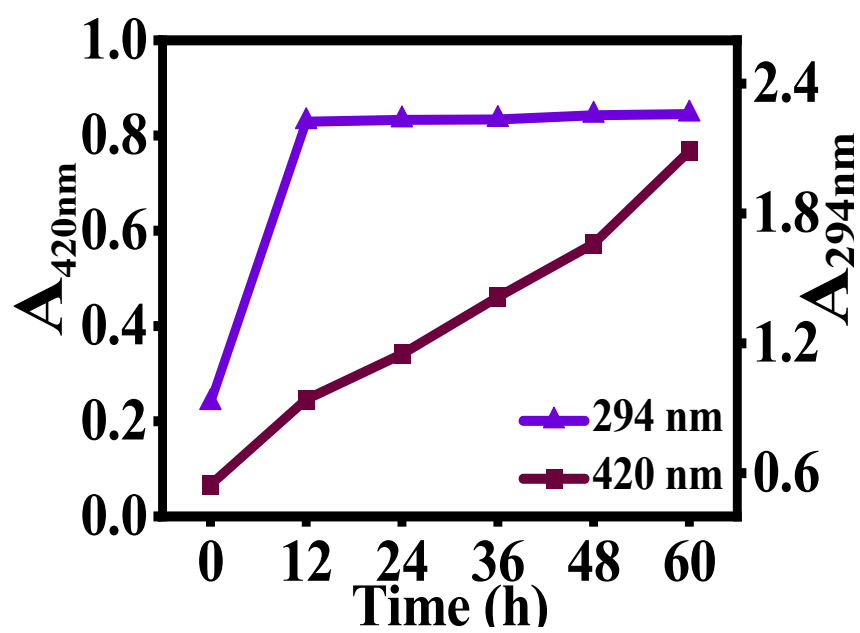


Figure S1. Browning index of WPI-GOS at wavelength 420 nm and absorbance of intermediates at 294 nm.

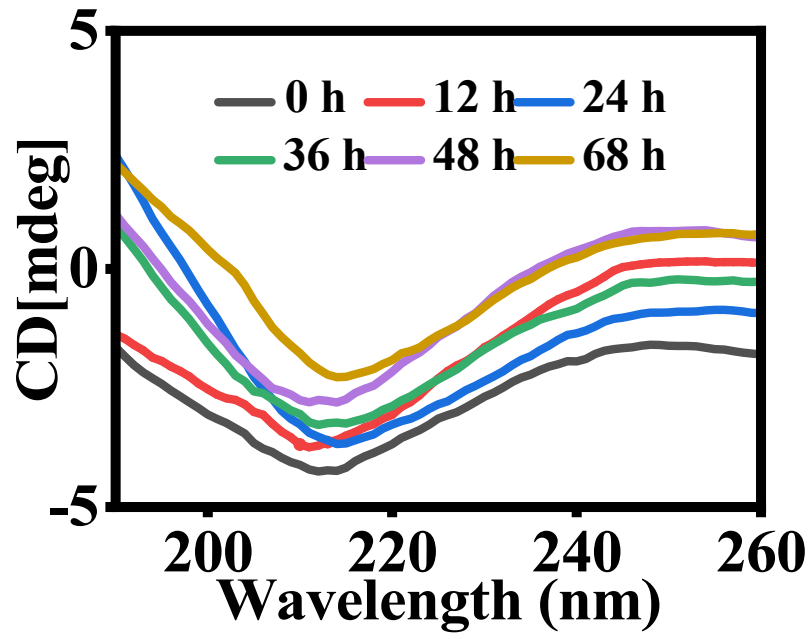


Figure S2 Circular dichroism spectra of WPI-GOS at different time.

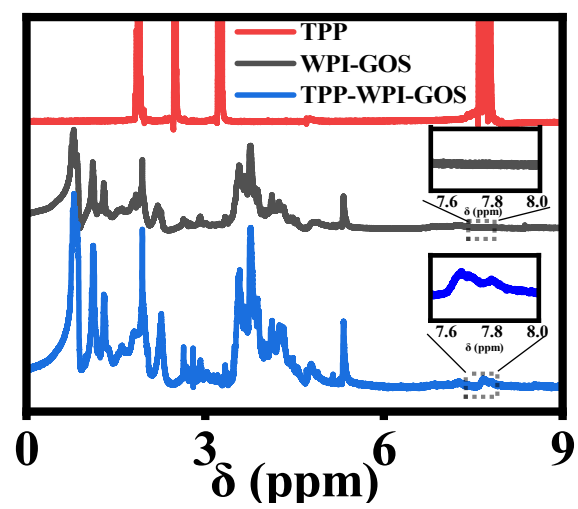


Figure S3 <sup>1</sup>H NMR spectra of TPP, WPI-GOS and TPP-WPI-GOS

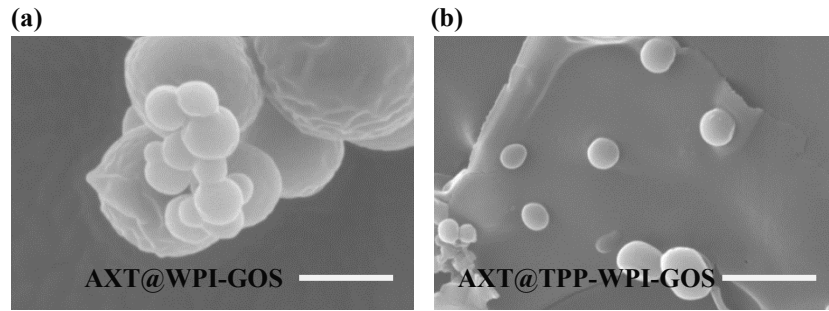


Fig. S4 SEM images of AXT@WPI-GOS and AXT@TPP-WPI-GOS nanoparticles.

Scale bars were 500 nm.