

# Supplementary Data

## Structural characterization and hypoglycemic activity of a novel pumpkin peel polysaccharide-chromium(III) complex

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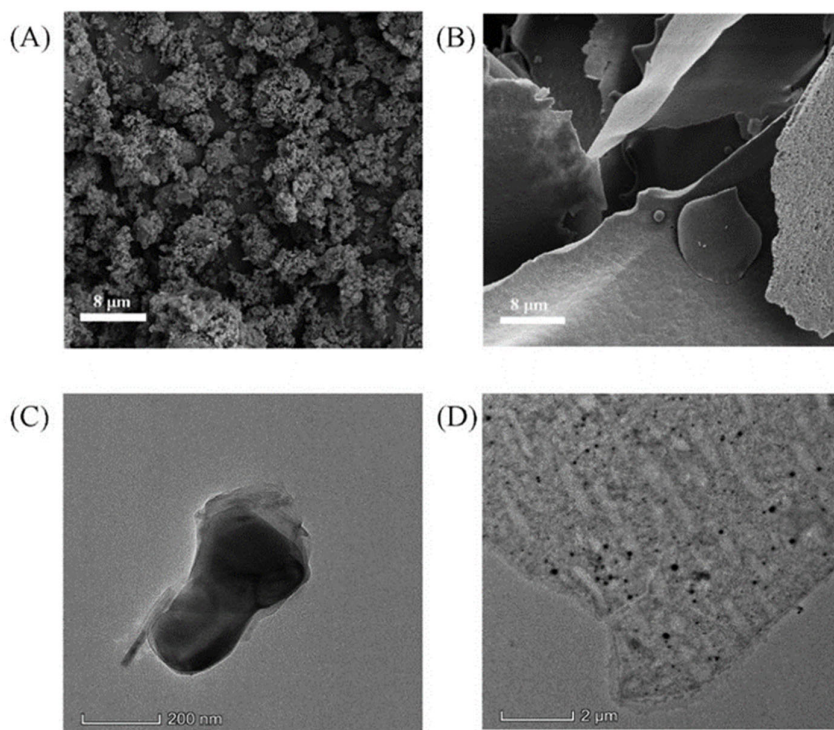
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### Text S1. SEM and TEM analysis

SEM and TEM are powerful tools to evaluate the difference in the surface and internal morphological structure between PPP and PPP-Cr(III). The surface morphological characterization was analyzed by a ZEISS-SUPRA™ 55 scanning electron microscopy (Carl Zeiss, Germany). Powdered samples were fixed on the sample stage and then coated with a thin layer of gold. The shapes and surface characteristics of PPP and PPP-Cr(III) were observed at an acceleration voltage of 5.0 kV under a high vacuum condition. The TEM images were recorded by an FEI Talos™ F200s instrument (Thermo Fisher Scientific Inc., USA). Briefly, 1 mg of the samples were diluted by 10 mL of ethanol solution, followed by ultrasonication at 100 W for 30 min. Then, 10  $\mu$ L of sample suspension was dropped onto a copper mesh and treated in a desiccator at 20 °C for 2 h. The obtained dried samples in the copper mesh were used for TEM analysis.

SEM images showed an obvious difference in surface morphology between PPP and PPP-Cr(III). As shown in Figure S1A and Figure S1B PPP was granules with a rough surface, while PPP-Cr(III) had a thin sheet-like structure with smooth surfaces. Besides, the structure of PPP-Cr(III) was dense, indicating that there existed strong inter molecular attraction [30]. These morphology changes between PPP and PPP-Cr(III) may be that there was increased inter molecular PPP-Cr(III) cross-linking in the coordinated process of PPP and Cr(III) [31]. Besides, the fine structures were confirmed by TEM images. Wherein, PPP was the sheet-like structure (Figure S1C), and PPP-Cr(III) was the sheet-like structure with nanoparticles (Figure S1D). Therefore, we inferred that the nanoparticles were Cr(III) compounds. The TEM images revealed that all nanoparticles were decorated on the PPP nanosheets in the PPP-Cr(III) composite, and no individual Cr(III) were observed (Figure S1D), which showed that all of Cr(III) has been loaded onto the PPP.



**Figure S1.** SEM images of PPP (A) and PPP-Cr(III) (B) at magnification 5000 $\times$ ; TEM images of PPP (C) and PPP-Cr(III) (D).

## Reference

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