GOx-Assisted Synthesis of Pillar[5]arene Based Supramolecular Polymeric Nanoparticles for Targeted/Synergistic Chemo-Chemodynamic Cancer Therapy

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**Abstract**

**Bacground**：Cancer is the most serious world's health problems on the global level and various strategies have been developed for cancer therapy. Pillar[5]arene-based supramolecular therapeutic nano-platform (SP/GOx NPs) was constructed successfully via orthogonal dynamic covalent bonds and intermolecular H-bonds with the assistance of glucose oxidase (GOx) and exhibited efficient targeted/synergistic chemo-chemodynamic cancer therapy.

**Method**: The morphology of SP/GOx NPs was characterized by DLS, TEM, SEM and EDS mapping. The cancer therapy efficinecy was investigated both in *vivo* and in *vitro*.

**Results**: SP/GOx NPs can load drug molecules (Dox) and modify target molecule (FA-Py) on its surface conveniently. When the resultant FA-Py/SP/GOx/Dox NPs enters blood circulation, FA-Py will target it to cancer cells efficiently, where GOx can catalyst the overexpressed GO to generate H2O2. Subsequently, the generated H2O2 in cancer cells catalyzed by ferrocene unit to form •OH, which can kill cancer cells. Furthermore, the loaded Dox molecules released under acid microenvironment, which can further achieve chemo-therapy.

**Conclusion**: All the experiments showed that the excellent antitumor performance of FA-Py/SP/GOx/Dox NPs, which provided an new method for pillar[5]arene-based supramolecular polymer for biomedical applications.

