

## Hybridization of TiO<sub>2</sub> with poly(acrylic acid)-calcium phosphate for drug delivery system (DDS) and photodynamic therapy (PDT)

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Some inorganic nanoparticles, such as titanium dioxide (TiO<sub>2</sub>), gain attraction due to their novel properties for cancer therapies. TiO<sub>2</sub> is a biocompatible material and has been used for a variety of fields including sun cream, implant, and food additives. Under UV irradiation, the TiO<sub>2</sub> particles can generate cytotoxic reactive oxygen species (ROS) in solution and the produced ROS can induce the death of cells, which is also known as photodynamic therapy (PDT). Hybridization with TiO<sub>2</sub> and other components can expand its usage in biomedical applications and enhance the selectivity of cytotoxicity for tumorous cells. Herein, we hybridized TiO<sub>2</sub> nanoparticles with poly(acrylic acid)-calcium phosphate (PAA-CaP) for drug delivery system (DDS) and PDT. The PAA-CaP shell, with its pH-responsive properties, not only enhanced loading anticancer but also manipulate photocatalytic properties of TiO<sub>2</sub> and release of the drug depending on pH condition. Results of preparation for the coated TiO<sub>2</sub> nanoparticles, drug delivery and photoactivity depending on pH condition, and *in vitro* test for comparing their cytotoxicity depending on cell lines will be discussed in the presentation.