

Protein-inorganic hybrid nanoflowers for versatile biotechnological applications

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Flower-like nanostructure, called 'nanoflowers', is a novel hybrid platform of organic and inorganic matters. Recently, flower-like enzyme-inorganic hybrid nanostructure has gathered a growing attention in various biotechnological fields to give the combined functionalities of the biomolecule and inorganic matter. Due to their facile synthesis under mild condition, large surface area, improved retention of biomolecules, and excellent stability of entrapped biomolecules, various protein molecules have been successfully incorporated within the nanoflowers and applied to biosensors, biofuel cells, and bioconversions. In this presentation, I will discuss the synthetic methods and mechanisms, structural and biological characteristics, as well as several applications studies performed in our group. Current challenges and future directions toward the design and development of multi-functional nanoflowers for their widespread utilization in biotechnology will be also discussed.