

Nanoparticles Carrying Biological Molecules: Recent Advances and Applications

ABSTRACT

In the past few decades, enormous advances have been achieved in the field of particle technology and the trend has been shifted from macro to micro and recently to the nanoscale. Integration of nanotechnology and biotechnology has paved the way to the development of biological nanoparticles, derived from biomolecules, and biomolecule-nanoparticle conjugates for numerous applications. This review provides an overview of various types of biological nanoparticles and the methods of their fabrication with primary emphasis on the drying methods, particularly on the newly emerging technique, the electro spraying. Recent advances in the integration of biomolecules with nanoparticles in the past five years to present are also discussed. Finally, the application of the biomolecule-nanoparticle conjugates in various fields including medicals and pharmaceuticals, biosensors and bioelectronics, foods, and agricultures are also highlighted.