



nanomaterials

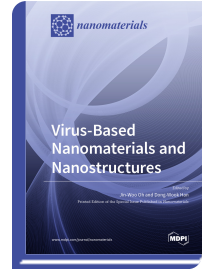


Special Issue Reprint

Virus-Based Nanomaterials and Nanostructures

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A virus is considered a nanoscale organic material that can infect and replicate only inside the living cells of other organisms, ranging from animals and plants to microorganisms, including bacteria and archaea. The structure of viruses consists of two main parts: the genetic material from either DNA or RNA that carries genetic information, and a protein coat, called the capsid, which surrounds and protects the genetic material. By inserting the gene encoding functional proteins into the viral genome, the functional proteins can be genetically displayed on the protein coat to form bioengineered viruses. Therefore, viruses can be considered biological nanoparticles with genetically tunable surface chemistry and can serve as models for developing virus-like nanoparticles and even nanostructures. Via this process of viral display, bioengineered viruses can be mass-produced with lower cost and potentially used for energy and biomedical applications. This book highlights the recent developments and future directions of virus-based nanomaterials and nanostructures. The virus-based biomimetic materials formulated using innovative ideas were characterized for the applications of biosensors and nanocarriers. The research contributions and trends on virus-based materials covering energy harvesting devices to tissue regeneration in the last two decades are discussed.



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