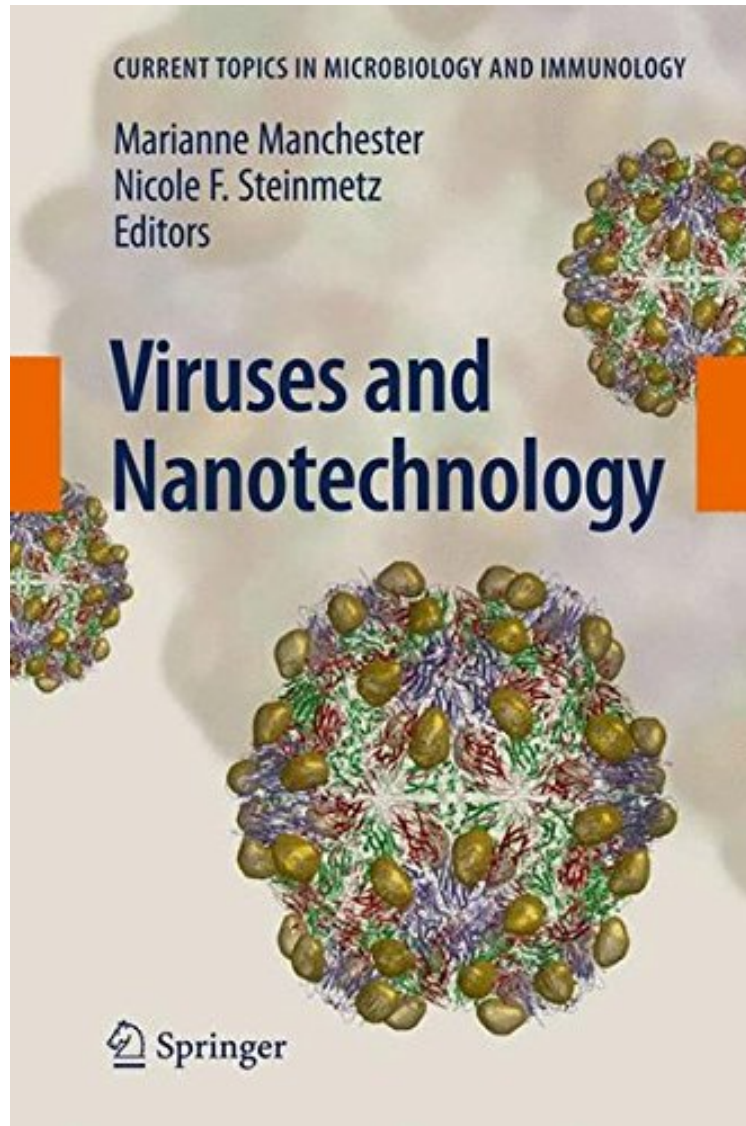


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Nanotechnology is a collective term describing a broad range of relatively novel topics. Scale is the main unifying theme, with nanotechnology being concerned with matter on the nanometer scale. A quintessential tenet of nanotechnology is the precise self-assembly of nanometer-sized components into ordered devices. Nanotechnology seeks to mimic what nature has achieved, with precision at the nanometer level down to the atomic level.

Nanobiotechnology, a division of nanotechnology, involves the exploitation of biomaterials, devices or methodologies in the nanoscale. In recent years a set of biomolecules has been studied and utilized. Virus particles are natural nanomaterials and have recently received attention for their tremendous potential in this field. The extensive study of viruses as pathogens has yielded detailed knowledge about their biological, genetic, and physical properties. Bacterial viruses (bacteriophages), plant and animal eukaryotic viruses, and viruses of archaea have all been characterized in this manner. The knowledge of their replicative cycles allows manipulation and tailoring of particles, relying on the principles of self-assembly in infected hosts to build the base materials. The atomic resolution of the virion structure reveals ways in which to tailor particles for higher-order functions and assemblies.

From the Back Cover
Nanobiotechnology involves the exploitation of biomaterials, devices or methodologies at the nanoscale. Virus particles are natural nanomaterials and have received particular attention as novel building blocks for materials design and fabrication. In this volume, leaders in the field of viral nanobiotechnology address the fundamental means for generating virus-based nanoparticles by performing chemistry on virion substrates, multilayered arrays and hybrid virus networks incorporating materials such as quantum dots and carbon nanotubes. The use of virus-like protein cages to generate novel materials that can be used for biomedical applications such as biomedical imaging and vaccine purposes is discussed. Finally, the novel tumor-targeting properties of certain viruses are harnessed to achieve specificity in vivo. This volume describes the unprecedented opportunities to capitalize on the vast knowledge of virus particles and their physical and material properties.