

Nano-Biomimetics: Harnessing Nature's Strategy to Design Efficient Antiviral and Antimicrobial Agents

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Currently, a problem is being faced in the treatment of infectious disease. Common antibiotic resistance has lowered the number of therapeutic choices available against bacterial diseases. On the other hand, recurring viral pathogen emergence also offers a serious concern.

Biomimetics is the utilization and application of natural notions and principles in the development of novel materials, devices, and systems. Biomimetic nanotechnology has also been used in the development of drug delivery systems, where nanoparticles can be generated to mimic the functioning of cells and target specific tissues or organs. This review delves into the innovative realm of Nano-Biomimetics. In this context, our objective is to provide a current review of the latest developments in biomimetic and bioengineered nano-therapies for the treatment of infectious diseases. By utilizing principles discovered in natural systems, innovative nanotechnology techniques are developing nanoscale materials and structures with exceptional antiviral and antibacterial properties. Nano-biomimetics shows significant promise in producing unique and effective treatments for fighting viral and bacterial infections through the application of biomimetic design concepts such as surface patterning, hierarchical structures, and bioactive molecules.

Keywords: biomimetics, biomimetic-nanotechnology, drug delivery system, bioactive molecules, bioengineered nano-therapies.

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