Special Issue

Recent Advances in Antibacterial Nanomaterials

Message from the Guest Editor

Recent advances in antibacterial nanomaterials have opened new pathways to combat microbial resistance and infections. Nanomaterials such as silver, zinc oxide, copper oxide, titanium dioxide, and carbon-based nanostructures exhibit strong antibacterial properties due to their high surface area, enhanced reactivity, and ability to interact with bacterial membranes.

They function through various mechanisms; Multifunctional and hybrid nanomaterials are also being developed; Furthermore, green synthesis methods are garnering interest as they provide the means to produce nanomaterials in an environmentally friendly and sustainable manner, using plant extracts or microorganisms.

Despite significant progress, challenges remain regarding the long-term toxicity, environmental impact, and large-scale production of these nanomaterials. Currently, research is focused on addressing these issues and developing safer, more effective antibacterial solutions for medical devices, coatings, textiles, and water purification systems.

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As the premier open access journal dedicated to experimental organic chemistry, and now in its 25th year of publication, the papers published in *Molecules* span from classical synthetic methodology to natural product isolation and characterization, as well as physicochemical studies and the applications of these molecules as pharmaceuticals, catalysts and novel materials. Pushing the boundaries of the discipline, we invite papers on multidisciplinary topics bridging biochemistry, biophysics and materials science, as well as timely reviews and topical issues on cutting edge fields in all these areas.

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