

# Nanomedicine: Simple Scraps to High Throughput Medical Therapy

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## **ABSTRACT**

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Interdisciplinary research has revolutionized the field of medicine and we have witnessed exponential increase in the high-impact research in past few decades. Rapidly developing resistance, modest clinical outcome and off-target effects are some of the major stumbling blocks which have confounded standardization of therapy. Nanotechnology may have the answers to outstanding questions of clinicians and can prove to be efficient in successful translation of therapeutics from bench-top to the bedside. Excitingly, many bioactive nano particles having experimentally proven efficacy are currently being tested for improved bioavailability by conjugation with different drugs or by using different nano technologically assisted delivery systems.

Our group has worked on silver nano particles synthesized through microalgae demonstrated considerable anticancer, anti-bacterial and antiviral activity. We also tested different biological applications of Ce doped CuO nanoparticles, Cu and Mg Doped ZnO Nanoparticles alone or in conjugation with extract from medicinal plants. We have reported significant antibacterial activity displayed by these conjugates. We also provide evidence of targeted killing of Multi-drug Resistant Bacteria by Ni Doped ZnO Nanorods and Ag doped ZnO nanorods. Recently, we have experimentally verified that Sn doping induced enhancement in the activity of ZnO nanostructures against antibiotic resistant *S. aureus* bacteria. Future studies must converge on a better and considerably improved understanding of the healing effect and toxicological profiling nanoparticles and nano technologically delivered drugs in animal models.

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