



Nano-Technological Advancement and Application in Antimicrobial Agents

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Received: December 05, 2018; **Published:** December 14, 2018

The human talents of notice, deliberate, and inventiveness are as old as humankind. Individuals around the globe have been tackling their interest in, demand and the procedure of a coherent philosophy. Later years have seen a phenomenal development in research in the zone of nanoscience. But, in any case, nanotechnology isn't new and, even though, Norio Taniguchi first coined the term Nanotechnology in 1974 and term first used in 1986 by the engineer K. Eric Drexler, in his book "Engines of Creation: The Coming Era of Nanotechnology." K. Eric Drexler was inspired by the Richard Feynman talk about "There's Plenty of Room at the Bottom" and discussed nanotechnology and possibility of manipulation of atoms via direct synthesis method in 1959. However, nanoparticles were utilized more than 2000 years back in Roman glass [1], where gold nanoparticles were used for producing distinctive hues, and all the more generally in earthenware production and glass from the tenth century [2]. The genuine push toward the utilization of nanoparticles did not happen until the point when the mid-twentieth century with the creation of carbon dark and, along these lines, smoldered silica during the 1940s.

The revelation of C₆₀ in 1985 [3] and carbon nanotubes in 1991 [4] gave a substantial upgrade to the advancement of nano structure materials and researchers prepared to investigate all the more enthusiastically the utilization of these materials. After the long gap, nanomaterial application re-emerges in all fields of science with huge advancement and considerable impact on human life. Because of some potential applications of nano-scale devices in government and public sectors. The only United States of America, President budget 2019 and provide \$ 1.4 billion for the National Nanotechnology Initiative (NNI) for early-stage applied research that will lead in future innovation and technology [5]. China has

also put vigorously in nanotechnology in the previous decades. It's one of the critical research areas in the medium and long-term projects in the range of 2006 and 2020. Chinese Academy of Sciences (CAS) in Beijing has driven a "Strategic Pioneering Program on nanotechnology," which has a financial plan of one billion yuan (US\$152 million), since 2012. China is now a noteworthy player in nanotechnology, positioning first worldwide as far as the number of Scientific papers and patents. Nowadays, an additional impetus to specialists creating applications, particularly maturing business visionaries, is the discussion of nanotechnology organizations opening up to the world and the high offer values related to them [6]. The initiative behind this program is improvement of nanostructured materials and the steady stream of new properties and abilities that are being found. These inventions seem to make likely a regularly expanding number of uses for which nanomaterials can give enhanced execution and the assurance of the upper hand and esteem creation [7]. Advances in existing generation strategies are enhancing the quality and yields, with economically feasible production. Ongoing reports from various working gatherings have featured the requirement for expanded examination of the wellbeing, ecological, what's more, correct parts of nanotechnology, and this is a zone that the business should see more entirely and make a suitable move on if the advantages of nanomaterials are to be figured it out.

The application of nanotechnology in medication, alluded to as Nanomedicine, is putting forth various energizing conceivable outcomes in medical services. Nanomaterials unique role in drug delivery, tissue engineering, nano-medical devices, and anti-microbial and dis-infective agents' developments. In general, medication safe

microorganisms are known as drug resistance microbes; it is severely increasing and creating some health issues. Diseases caused by multidrug drug resistance bacteria lead to enhancement in death rate, even after utilizing concerning the drugs. According to the recent reports, ~700000 people will die from the drug-resistant pathogen infections constantly, and the number will achieve 10 million by 2050 [8]. The World Bank (March 2017) estimated that the antimicrobial resistance and global GDP in the between 1.1 and 3.8 % now and 2050 [9]. Alone Wellcome Trust of UK government will invest in antimicrobial resistance could cost US\$100 trillion among now and 2050, with the annual death, will achieve 10 million over that period [10]. The rising threat of drug-resistant pathogen, it is of exceptional sincerity to examine new counter-agent or drugs and anti-toxin administrators and furthermore frameworks that will be effective to negate calm, safe microorganisms. Nanotechnology provide alternative tools to control the drug-resistant pathogens which are seriously required, and nanomaterials can be an incredibly encouraging approach [11]. The antimicrobial capability of metallic nanostructured particles and their mechanisms of action are still in discussion. Some metallic nanoparticles release cationic ions that can tie to sulphur-containing proteins of the cell and interferes cell permeability; or may interact with DNA; interruption of electron transport, protein oxidation, and layer potential crumple; generation of ROS (Reactive Oxygen Species) that can cause disturbance of cell membrane [12-14]. These systems may not work independently proposing that beyond what one component can happen all the while. It must be called attention to that nanotechnology is additionally accessible to other wellbeing applications, for example, organic markers for malignancy medicines. At long last, the unfavourable impacts of nanomaterials cannot be discounted. Consequently, more clinical preliminaries and also, investigate in the dimension of sub-atomic science is required for a securely utilize. Besides, the creation and blend of the nanomaterials need to consider the use of green nanotechnology standards, evaluating the natural dangers of fabricated nanomaterials.

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Volume 2 Issue 1 January 2019

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