Chapter 8
Antimicrobial Activity of Silver and Copper Nanoparticles: Variation in Sensitivity Across Various Strains of Bacteria and Fungi

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8.1 Introduction

Prevention of infectious diseases through control of pathogenic microorganisms has been a major challenge across the globe. Infectious diseases may spread through consumption of contaminated food and water, hospital-acquired diseases, and pandemics. Numerous antibiotics and antifungal formulations are available for control of disease-causing microorganisms; however, their efficacy is known to vary. Moreover, with the widespread use of antibiotics, antibiotic-resistant strains are developing to cause an even greater threat to public health. Thus, there is a need for exploring alternative strategies for controlling the spread of infectious diseases.

Chemical disinfectants, such as chlorine, are commonly used for inactivating harmful microorganisms in water so as to render it fit for drinking purposes. However, in the presence of trace organics in water, chlorine-based disinfectants are known to form disinfection byproducts (DBPs), such as trihalomethanes (THMs) and haloacetic acids (HAAs), that pose a threat to human health. THMs and HAAs are disinfection byproducts that have been implicated both in genotoxic risk and carcinogenic risk. Since halomethanes were discovered in chlorinated water in 1974, alleviation of DBPs has become a prime concern in water treatment.