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Special Issue Reprint

Novel Antimicrobial Strategies to Combat Multidrug-Resistant (MDR) Gram-Negative Bacteria

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Infections and mortality caused by Gram-negative bacteria (GNB) are increasing globally. Moreover, these types of infections are becoming increasingly harder to treat, given the concurrent increase in the prevalence of antibiotic-resistant bacteria. Furthermore, GNB tend to become resistant to multiple drug classes, referred to as being multidrug-resistant (MDR) GNB, which often leaves physicians with few or no treatment options. GNB possess a plethora of resistance strategies, either intrinsic or acquired, to avoid antibiotic-mediated cell death. Resistance genes and determinants rapidly spread among bacterial populations, which contributes to the rapid emergence of MDR strains. The main weapon of GNB is their cell wall, specifically the outer membrane, which serves as an excellent permeability barrier to drugs and environmental insults. Bacteria can also acquire or evolve resistance to common skin antiseptics and disinfectants, contributing to hospital outbreaks. Developing novel strategies to treat and limit the spread of drug-resistant GNB is imperative and will serve as the primary focus of this Special Issue, which focuses on studies that explore and discuss:

1. New insights into the mechanisms of antibiotic or antiseptic resistance;
2. Determination of novel combinations of drugs to eliminate MDR bacteria;
3. Discovery of novel drug targets for antibiotic development;
4. Development of novel in vitro or animal models of infection;
5. Evaluation of the potency of new antibiotics on MDR bacteria;
6. Emergence of new resistance determinants in hospital populations.

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