



# Photocatalytic Degradation of Four Emerging Antibiotic Contaminants and Toxicity Assessment in Wastewater

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## INTRODUCTION

Antibiotics have revolutionized modern medicine, effectively combating bacterial infections and saving countless lives. However, like any medication, antibiotics come with potential side effects that should be understood and considered. While they are generally safe and well-tolerated, it is essential to be aware of the possible risks associated with their use. In this article, we will delve into the world of antibiotics, explore their benefits, and discuss the various side effects that can occur. Before diving into the side effects, it is crucial to understand what antibiotics are and how they work. Antibiotics are a class of drugs used to treat bacterial infections by either killing the bacteria or inhibiting their growth. They target specific processes or structures within bacterial cells, such as cell wall synthesis, protein synthesis, or DNA replication. By disrupting these vital functions, antibiotics effectively eliminate bacterial infections. One of the most common side effects of antibiotics is gastrointestinal disturbances. Antibiotics can disrupt the natural balance of beneficial bacteria in the gut, leading to conditions like diarrhea, nausea, vomiting, and abdominal pain. This disruption occurs because antibiotics do not discriminate between harmful bacteria causing the infection and the beneficial bacteria residing in our bodies. Another potential side effect of antibiotics is an allergic reaction. Some individuals may develop allergies to specific antibiotics, which can range from mild skin rashes to severe anaphylactic reactions. It is essential to inform healthcare providers about any known allergies before starting antibiotic treatment.

## DESCRIPTION

Antibiotics can also lead to the development of superinfec-

tions. These are new infections caused by opportunistic pathogens that take advantage of the disrupted balance of microorganisms in the body. Common superinfections include oral thrush, vaginal yeast infections, and Clostridium difficile-associated diarrhea, which can be severe and difficult to treat. The overuse and misuse of antibiotics have contributed to the rise of antibiotic resistance, a global health concern. When bacteria are exposed to antibiotics repeatedly, they can develop mechanisms to survive and multiply despite antibiotic treatment. This makes future infections harder to treat and may require stronger antibiotics or alternative treatment options. Penicillins, such as amoxicillin and ampicillin, are commonly prescribed antibiotics. They are generally well-tolerated but can cause allergic reactions in some individuals. Allergic reactions to penicillins range from mild skin rashes to severe anaphylaxis, which requires immediate medical attention. Tetracyclines, like doxycycline, are broad-spectrum antibiotics used to treat a variety of bacterial infections. They can cause gastrointestinal disturbances, including nausea, vomiting, and diarrhea. They may also affect tooth development in children and cause photosensitivity reactions in some individuals. Fluoroquinolones, such as ciprofloxacin and levofloxacin, are potent antibiotics used to treat a range of infections. However, they carry a risk of tendonitis and tendon rupture, particularly in older adults or those who engage in strenuous physical activity. Additionally, they can cause gastrointestinal symptoms, headaches, and allergic reactions.

## CONCLUSION

Antibiotics are a vital tool in fighting bacterial infections, but they are not without risks. Gastrointestinal disturbances, allergic reactions, superinfections, and antibiotic resistance are

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among the potential side effects associated with their use. It is important to be aware of these risks and take necessary precautions to minimize them. Always consult with healthcare professionals, follow prescribed dosages, and consider strategies such

as probiotic use to maintain a healthy balance while reaping the benefits of antibiotics. With responsible use and awareness, we can ensure the continued efficacy of antibiotics as life-saving medications.