



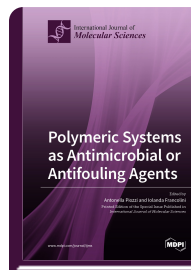
*Special Issue Reprint*

## **Polymeric Systems as Antimicrobial or Antifouling Agents**

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The rapid increase in the emergence of antibiotic-resistant bacterial strains, combined with a dwindling rate of discovery of novel antibiotic molecules, has created an alarming issue worldwide. Although the occurrence of resistance in microbes is a natural process, the overuse of antibiotics is known to increase the rate of resistance evolution. Under antibiotic treatment, susceptible bacteria inevitably die, while resistant microorganisms proliferate under reduced competition. Therefore, the out-of-control use of antibiotics eliminates drug-susceptible species that would naturally limit the expansion of resistant species. In addition, the ability of many microbial species to grow as a biofilm has further complicated the treatment of infections with conventional antibiotics. A number of corrective measures are currently being explored to reverse or slow antibiotic resistance evolution, among which one of the most promising solutions is the development of polymer-based antimicrobial compounds. In this Special Issue, different polymer systems able to prevent or treat biofilm formation, including cationic polymers, antibacterial peptide-mimetic polymers, polymers or composites able to load and release bioactive molecules, and antifouling polymers able to repel microbes by physical or chemical mechanisms are reported. Their applications in the design and fabrication of medical devices, in food packaging, and as drug carriers is investigated.



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