The Effects of the Biocide Triclosan on Antibiotic Resistance in Bacteria

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Background

- Antibiotic resistance is an increasing public health concern.
- Escherichia coli and Staphylococcus aureus are opportunistic pathogens that can develop antibiotic resistance.
- Triclosan, a biocide, inhibits the growth of many types of bacteria; found in toothpastes, soaps, and other products.
- These changes may affect antibiotic efficacy.

Materials and Methods

- Original sample plate of identical cells from tryptic soy broth (TSB), inoculate with cells, creating genetically identical cells.
- Expose cells to triclosan on antibiotic plates and tryptic soy broth to determine number of viable cells in agar.
- The results of this study suggest that the use of biocides such as triclosan may not significantly contribute to antibiotic resistance nor be an imminent public health threat.

Results

- Exposure to a sub-inhibitory concentration of triclosan increased the susceptibility of E. coli to polymyxin B.
- May be due to an outer membrane change resulting in a weakened state that allowed polymyxin B to more effectively inhibit growth.
- No significant change in E. coli’s susceptibility to erythromycin.
- No significant change in susceptibility to either erythromycin nor vancomycin in S. aureus.
- The lack of increase in antibiotic resistance may be due to the differences in mechanisms of action between triclosan and the various antibiotics.
- Future work: Examine morphological changes that occur in cells following triclosan exposure.
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Discussion

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References