

Fighting Bacteria with Liposomes: A Better Way to Deliver Antibiotics

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Question

Problem

- Antibiotic resistance has been fought by enclosing antibiotics in liposomes.
- Limited literature has studied the effect of liposomal enclosure on non-resistant bacteria.

Question

- Can liposomal enclosure of antibiotics improve drug efficacy on non-resistant bacteria?

Hypothesis

- Liposomal enclosure will improve the efficacy of antibiotics on non-resistant strains of bacteria

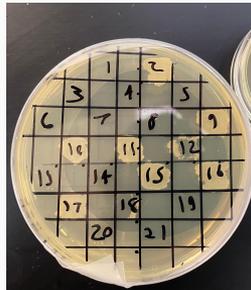
Methods

Preparation

- Liposomes were made by hydrating phospholipids
- Solutions of 10, 50, and 100 µg/mL of ampicillin and streptomycin were made. Equivalent solutions were prepared with added liposomes
- 21 1-cm² squares were drawn on a petri dish and *E. Coli* was scratched onto these squares.
- Solutions were added to specific squares and then incubated for a day. Some squares were used as controls to see if any solution used was contaminated.

Recording

- Zone of inhibition was measured in millimeters for each square.



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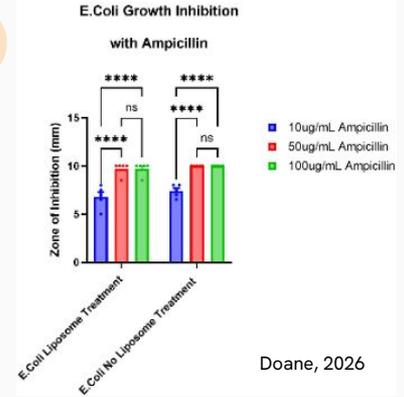
Analysis & Results

Results

- Minimal difference was observed in the inhibition between antibiotics with and without liposomes at the same concentrations

Statistics

- ANOVA test showed no significant difference was found between with and without liposomes for both antibiotics.
- GraphPad prism was used to generate all graphs used



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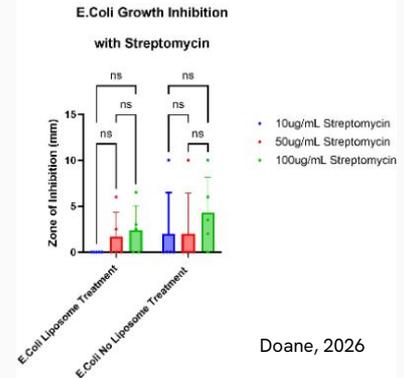
Conclusions

Conclusion

- Liposomal enclosure may not improve antibiotic efficacy in non-resistant strains of *E. Coli*.

Further Testing

- Alternative liposome preparation methods, such as the ethanol injection method, should be tested.
- Gram-positive bacteria should be tested.



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