

RECCE® 327 Demonstrates Bactericidal Activity against Several Microbial Species

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Background

The World Health Organization has recognized the growing threat of antimicrobial resistance (AMR) as one of the top 10 dangers to humanity.¹ Common infections are becoming increasingly resistant to available therapies resulting in multi-resistant and pan-resistant microbial species, including *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter* better known as ESKAPE pathogens.^{2,3} Beyond AMR's impact on human health, it poses significant economic costs, leading to longer hospital stays, the need for more expensive medicines and a greater financial burden on patients.^{2,3} We must take appropriate action to develop antimicrobial substances that not only kill resistant pathogens but also circumvent the mechanisms of resistance.

Materials

We investigated the activity of a new synthetic polymer anti-infective with rapid and potent broad-spectrum bactericidal activity known as RECCE® 327 (R327) against Gram-positive, Gram-negative, and mycobacterial species, including the ESKAPE pathogens, *B. subtilis* and in biofilms of *E. coli* to determine the effects of R327 on these bacterial species.

Results

Our results demonstrate that R327 is rapidly bactericidal, reducing viable cell counts across all tested bacterial species and conditions. Cells treated with R327 showed rapid, dose dependent, decreases in cellular ATP levels in luciferase based *in-vitro* ATP assays. R327 treatment of the mycobacteria *M. avium* and *M. abscessus* also led to a decline in ATP levels, though more slowly likely due to the low growth rate of these strains. In some species of gram-positive bacteria, the *in-vitro* ATP assay indicated transient increases in ATP levels upon treatment with R327 at high concentrations, while viable cell counts showed rapid cell death under the same conditions.

Conclusion

These data suggest that the apparent increase in ATP levels may be an artifact of the *in vitro* kit and imply that the MOA of R327 may involve destabilization of the cell envelope. Our results further reinforce the broad-spectrum bactericidal activity of R327 and demonstrate its potential as a new anti-infective.

