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Advancing the Arizona State University Knowledge Enterprise

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Novel Antimicrobial Compositions and Rapid Screening Method

Antibiotic resistance is one of the greatest clinical and public health threats worldwide, primarily stemming from the overuse and misuse of antibiotics and biocides. It causes billions of healthcare-related costs as well as 2 million hospitalizations and thousands of deaths annually. While there has been research into new antibiotics, the process is slow and novel methods of inactivation as well as new screening methods are needed to speed the process along.

Prof. Conroy-Ben, at Arizona State University, has developed novel antibiotic compositions as well as a large-screen method for the rapid discovery of new antibiotics. The streamlined method screens for antimicrobial activity of compositions with new inactivation mechanisms and can help determine optimum concentrations of synergistic components in compositions. Testing of the synergistic antimicrobial compositions that were developed, on wild-type E. coli, demonstrated enhanced toxicity. The toxic effect was further evaluated and validated through a 24-hour growth curve, the coefficient of drug interaction (CDI) values, and select antibiotics run in checkerboard fashion. The screening method yielded trends for various mixed compositions that are in agreement with published studies.

These novel compositions and rapid large-scale approach can be used to treat infections, tackle antibiotic resistance and study and create new synergistic biocide mixtures.

Potential Applications

- Antibiotic compositions for treating infection
- Antibiotic or biocide drug discovery

Benefits and Advantages

- Synergistic combinations showed enhanced toxicity compared to individual components

o Some compositions showed increased membrane permeability

- Increased glycopeptide lethality when combined with synergistic components
- Results can be obtained and analyzed within 72 hours
- Can help determine optimum concentrations of the synergistic components
- Helps discover biocides with new mechanisms of action

For more information about the inventor(s) and their research, please see

Dr. Conroy-Ben's departmental webpage