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Amphiphile-enhanced antibiotic potency: Imaging penetration

We have recently found that the presence of hydrophile synthetic pore-forming cation transporters enhance the potency of antibiotics against various microbes when the two are co-administered. Both gram negative *Escherichia coli* and gram positive *Bacillus subtilis* bacteria have been studied along with the yeast *Saccharomyces cerevisiae*. The membranes of gram positive and negative bacteria differ substantially from each other and neither is similar to that of the primary eukaryote. The antibiotics that have been most extensively studied thus far are erythromycin, kanamycin, rifampicin, and tetracycline. These four antibiotics all differ in structure and in their mechanisms of action. Notwithstanding, synergy is observed between the ion transporter and the antibiotics, leading to potency enhancements of >20-fold. The ion transporters are toxic to bacteria, but in the experiments described here, they are used at concentrations sufficiently low that they do not affect bacterial growth. As part of a program to better understand the synergy, we have examined fluorescent ion transporters by using both fluorescent and confocal microscopy. Electron microscopic results will also be presented that augment the optical imaging results.

Biography

George W Gokel is a Distinguished Professor of Science and Director of the Center for Nanoscience at the University of Missouri, St. Louis. He holds an Adjunct Appointment in the Washington University School of Medicine in St. Louis, from which he is retired. He has published more than 400 peer reviewed papers and has authored, co-authored, or edited 19 books. He is named as an Inventor on 15 issued United States patents.

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