ACS Infectious Diseases

In This Issue

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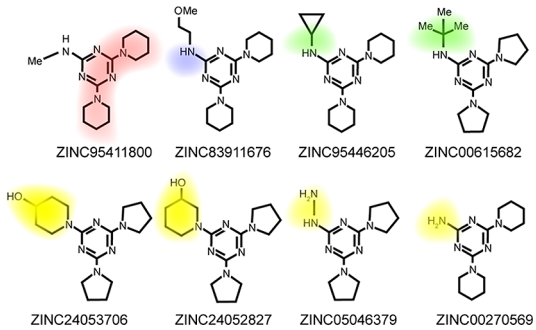
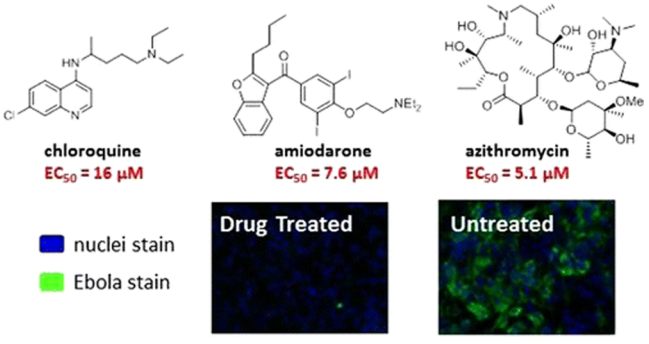
USING AMOEBAE TO SCREEN FOR INTRACELLULAR ANTIBACTERIAL ACTIVITY



Efforts to identify and develop new broad-spectrum antibiotics are often hampered by issues with target specificity and the development of drug resistance. For intracellular pathogens, such as *Legionella pneumophila*, limited uptake of antibiotics in the host cell presents an additional barrier preventing access of the drug to the bacterial target. To overcome these issues, the development of antivirulence compounds as antimicrobials has been proposed.

In this ACS Editors' Choice article, Harrison et al. (DOI: 10.1021/acsinfecdis.5b00002) use an amoebae-based chemical screen to identify a group of compounds that inhibit intracellular replication of *L. pneumophila*. From the compounds identified in the screen, the authors further develop several advanced compounds. Ultimately, the authors identify a single inhibitory compound demonstrating strong, specific, antivirulence activity against intracellular *L. pneumophila*, thus demonstrating the potential for this type of amoebae-based screen to simultaneously overcome several challenges to antibiotic discovery.

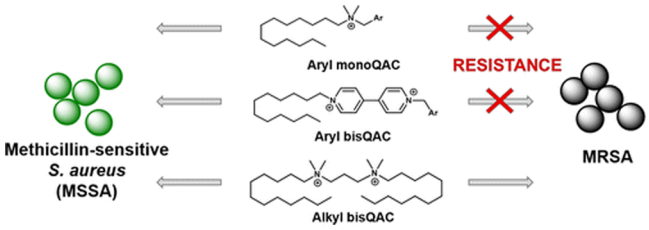
THE CHALLENGES OF DRUG REPURPOSING FOR TREATMENT OF EBOLA



The development of new antivirals is an expensive, time-consuming, and labor-intensive process. When a strong and immediate need for new antiviral therapies exists, such as the situation with the recent outbreak of Ebola virus, researchers must find a way to expedite the drug discovery process. Investigating currently approved therapeutics for a novel application (drug repurposing) presents an appealing option to circumvent some of the challenges associated with drug development.

In this issue, Madrid et al. (DOI: 10.1021/acsinfecdis.5b00030) conduct a systematic screen of FDA-approved drugs to identify compounds with in vitro antiviral activity against Ebola virus. Animal models of Ebola virus infection are used to further test lead compounds, including an antibiotic, an antimalarial, and an antiarrhythmia drug, for protection against Ebola virus in vivo. Importantly, the authors highlight the limitations and challenges associated with attempts to repurpose approved drugs.

INVESTIGATING THE NEXT GENERATION OF DISINFECTANTS



The use of disinfectants is widespread in today's society. The active antibacterial ingredients in many of these disinfectants are quaternary ammonium compounds (QACs), and resistance to QACs is on the rise.

Here, Jennings et al. (DOI: 10.1021/acsinfecdis.5b00047) investigate the antibacterial and antibiofilm properties of structurally distinct QACs against methicillin-susceptible *Staphylococcus aureus* (MSSA) and methicillin-resistant *S. aureus* (MRSA). The authors compare the propensity of MSSA to develop resistance to monoQACs, bisQACs, and multiQACs. The potent antibiofilm activity of multiQACs against both MSSA and MRSA, together with the low propensity for these organisms to develop resistance to multiQACs, suggests these compounds may serve as the next generation of disinfectants.

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