# Novel Aryl Isonitriles as Antimicrobial Therapy

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## Technology description

## Background

Antibiotics and infectious disease therapy made huge strides in the last century; however, the emergence of resistant strains and superbugs has increased. In the United States alone, 2 million people each year are affected by these infections, resulting in over 23,000 fatalities. Out of these, nearly half are caused by the pathogen methicillin-resistant Staphylococcus aureus (MRSA). Methicillin- and vancomycin-resistant Staphylococcus aureus (MRSA and VRSA) cause a range of diseases including superficial skin infections, pneumonia, osteomyelitis, and bloodstream infections. These strains have become resistant to nearly every class of antibiotics, including agents of last resort, such as vancomycin and linezolid.

## Technology Summary

Researchers at Purdue University have identified a novel class of compounds that have an aryl isonitrile moiety that shows potent inhibitory activity against clinically important strains of MRSA and VRSA, Bacillus anthracis, and Listeria monocytogenes. These compounds demonstrate strong antimicrobial activity against MRSA strains that are resistant to numerous antibiotic classes such as penicillins, aminoglycosides, macrolides, lincosamides, tetracyclines, and fluoroquinolones. Not only are these compounds potent, they do not show any apparent toxicity against mammalian cells up to a

concentration of 64 micrometers, compared to other antibiotics that have a narrow therapeutic to toxic concentration range. In addition, analysis implies that cross-resistance between other antibiotics and these aryl isonitrile compounds is unlikely. Hence, these compounds have the potential for use as future alternatives to other antibiotics for the treatment of resistant strains of MRSA and VRSA in clinical settings.

## Application area

Pharmaceutical industry
Drug R&D
Alternative antimicrobial therapy
Treatment of antibiotic-resistant strains

## Advantages

Potent antimicrobial activity
Minimal toxicity at high concentrations
Effective against resistant strains

## Institution

Purdue University

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