

Team develops new antibiotic formulation to fight MRSA and other antibiotic-resistant bacteria

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Credit: University of Oklahoma

A University of Oklahoma team of chemists has developed a new antibiotic formulation to fight the sometimes deadly staph infection caused by methicillin-resistant *S. aureus* or MRSA and other antibiotic-resistant infectious bacteria. The new drug to treat MRSA combines traditional Food and Drug Administration-approved antibiotics, such as methicillin, with the polymer BPEI.

Charles Rice, principal investigator and professor in the Department of Chemistry and Biochemistry, OU College of Arts and Sciences, with team members Robert Cichewicz and Daniel Glatzhofer, both OU chemistry professors, has been able to invigorate older drugs from the penicillin family by combining them with BPEI. While this new formulation requires FDA approval, the approach restores efficacy to obsolete antibiotics.

"The use of first-line antibiotics to kill MRSA or other infectious bacteria will improve patient outcomes and lower the economic burden," Rice said. "The discovery in our laboratory has made it possible to create an effective antibiotic that can reduce expensive hospitalization costs."

Leading up to the discovery, Rice was working in his laboratory when he discovered a way to neutralize the MRSA bacteria so that it is no longer resistant to methicillin. This method can be used to neutralize other infectious bacteria. The takeaway from these experiments is that any number of penicillin-type drugs combined with BPEI or related polymers could create a new first-line drug for treating infectious diseases and change how MRSA and other infectious bacteria are treated.

The Centers for Disease Control considers MRSA a serious threat to human health. MRSA infected 80,500 people in 2011 and nearly one in seven cases resulted in death. When MRSA colonies invade host tissue, they release toxins that cause tissue injury leading to patient morbidity. Until now, more costly and highly toxic antibiotics of last resort were used to treat MRSA. The new first-line combo drug developed at OU by Rice and his team has the potential to change how patients with MRSA are treated.

Funding for this research was provided by the National Institutes of Health and the University of Oklahoma. The *Journal of Antibiotics* has

published a paper on the OU-developed first-line combo [drug](#) to treat deadly [infectious bacteria](#), such as MRSA.

Provided by University of Oklahoma

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