

# Researchers discover new variant on notorious resistance gene

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Polymyxin antibiotics are used as a last resort to treat certain multidrug resistant bacteria. A team of investigators in China has discovered a new variant on a well-known gene that causes resistance to polymyxins and others. More troubling, the gene containing this mechanism was found in a healthy individual during a routine medical examination, suggesting that other healthy carriers may be spreading this resistance unknowingly. Unlike any other members of its class, the gene was found in the food-borne pathogen, *Salmonella*. The research is published in *Antimicrobial Agents and Chemotherapy*, a journal of the American Society for Microbiology.

The new mechanism is a variant on the notorious, highly multidrug resistant mcr-1 gene. The investigators have dubbed this new variant mcr-1.6. "This is the first time an mcr-1 gene has been found in *Salmonella* in a healthy carrier," said corresponding author Biao Kan, PhD, professor of pathogenic microorganisms and infectious [disease control](#), National Institute for Communicable Disease Control and Prevention, at the Chinese Center for Disease Control and Prevention.

"Healthy carriers play an important role in transmission of [resistance](#) genes to the community," said Kan. That's because they spread disease stealthily, in the manner of the infamous Mary Mallon, who was responsible for several outbreaks of typhoid during the first half of the last century, earning her the sobriquet, Typhoid Mary.

As for the finding in *Salmonella*, Kan noted that "Salmonella infections

have been the leading cause of foodborne illness, and Salmonella-carrying mcr-1 will likely be a problem in food safety."

The gene, mcr-1 and its variants, including mcr-1.6 all need to be monitored closely because of their resistance to polymyxin antibiotics, generally, and to colistin, in particular, said Kan. A particular concern is the possibility that new variants on any of these mcr-1 [genes](#) could result in increased resistance to colistin. In such cases, higher doses than usual might be necessary "when colistin is being used as the last line of antimicrobial treatment following previous treatment failures," said Kan.

As with many [resistance genes](#), this one is carried and transmitted on a plasmid, a piece of extra-genomic DNA which can jump from one species of bacterium to another. The particular plasmid carrying this gene, known as IncP, has a broad host range, and a high frequency of jumping from species to species, said Kan—more reasons for careful monitoring.

Provided by American Society for Microbiology

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