

Protein found to promote antibiotic resistance in a common food-borne pathogen

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Researchers from Iowa State University have identified a novel factor that promotes the development of antibiotic resistance in a bacterial pathogen. The study, published June 6th in the open-access journal PLoS Pathogens, explains that Mfd, a protein involved in DNA transcription and repair, plays an important role in the development of fluoroquinolone resistance in *Campylobacter*, a bacterial pathogen commonly associated with food poisoning in humans.

Development of antibiotic resistance in *Campylobacter*, especially to fluoroquinolone (a broad-spectrum antimicrobial), compromises clinical therapy and poses a public health threat. Previous studies have revealed that *Campylobacter* is highly mutable to antibiotic treatment and the number of fluoroquinolone-resistant *Campylobacter* is greatly increased in many regions of the world. But it has not been clear why *Campylobacter* is able to mutate at such a high frequency.

Using various molecular tools, the research team from the College of Veterinary Medicine, led by Dr. Qijing Zhang, has found that *Campylobacter* increases the production of Mfd in the presence of a fluoroquinolone antibiotic. Elimination of Mfd from *Campylobacter* resulted in 100-fold reduction in the rate of emergence of mutants resistant to fluoroquinolones. Without Mfd, the development of fluoroquinolone-resistant *Campylobacter* under antibiotic treatment is significantly reduced.

These findings have uncovered a previously unrecognized role of Mfd in

promoting mutations conferring antibiotic resistance. Despite its importance, Mfd is not the only factor influencing the mutation frequency and future studies will be needed to determine how Mfd increases the emergence of antibiotic-resistant mutants.

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