

# Impact of Chloramphenicol exposure on the transfer efficiency of multidrug resistance plasmids in *Salmonella enterica*

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## Abstract

**Background:** *Salmonella enterica* is a zoonotic pathogen that causes bacterial foodborne disease. Dissemination of multidrug resistance (MDR) phenotypes are considered a public health concern. Antimicrobial agents impact selective pressure that contributes of the emergence MDR bacteria; however, little knowledge about the impact of the antimicrobial exposure, in this case chloramphenicol, on the spread of antimicrobial resistance plasmids is known. Therefore, we established a study to assess the effects of chloramphenicol exposure on the response of six multidrug resistant *Salmonella* isolates to determine the relative impact on chloramphenicol exposure on conjugation efficiency and plasmid transfer. **Methodology & Theoretical Orientation:** The MDR *Salmonella* isolates were examined to assess their ability to transfer plasmids to a susceptible *Escherichia coli* strain (J53) using antimicrobial exposure experiments. Six *Salmonella* isolates (142, 143, 163, 462, 710, and 452) with different plasmids profiles were selected to determine the impact of chloramphenicol exposure with different concentrations including non-antimicrobial exposed (control sample) to concentration ranging from 0.0063 to 64 µg/ml on the plasmid transfer. Transconjugants from these experiments were evaluated through PCRbased replicon typing to determine if the plasmids transferred or not. The *Salmonella* donor isolates were sequenced using the Illumina-based whole genome sequencing to detect the variation of potential genetic in regard of conjugation efficiency mechanism. **Conclusion & Significance:** Chloramphenicol exposure had a significant impact on the transfer of antimicrobial resistance among some *Salmonella* isolates in a dosedependent manner. The results indicated there is a distribution of plasmids transfer among the six *Salmonella* isolates were variable with different plasmids replicon types. These results are instrumental to ongoing studies to examine the different express genes on conjugation dynamic after chloramphenicol exposure among *Salmonella* isolates by using the RNA-seq analyses to identify the genetic pathways that contribute to resistance plasmid transfer following antimicrobial exposure.

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## Biography

Suad Algarni was working as visitor at the National Center for Toxicological Research (NCTR), Jefferson, AR, US. She is a doctoral candidate through the University of Arkansas under supervision Dr. Steven Foley in a research project to understand the impact of the exposure of the antibiotics such as chloramphenicol and tetracycline on the ability to transfer antimicrobial resistance in *Salmonella*. Some of these data studies have contributed to an abstract that has

been accepted and presented at the Antimicrobial Resistance in Animals and the Environment conference in France, where Suad is one of the authors of the abstract. This approach should allow for more focused efforts are ongoing to develop tools to better understand the factors that drive the dissemination of plasmids and potentially can lead to transfer of resistance within the Glimicrobiome.