

## The Effect of next generation probiotics (NGPs) on *Clostridium difficile* Sporulation

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*Clostridium difficile* infection (CDI) is the leading cause of hospital acquired, antibiotic associated diarrhea in the United States. According to a Centers for Disease Control and Prevention (CDC) study in 2015, nearly half a million-people suffered from CDI in a single year, the cost of treatment of CDI rose to nearly 4.8 billion dollars. Due to the potentially high consequences of antibiotic resistance, *Clostridium difficile* (*C. diff*) has been characterized by the CDC as an urgent infectious disease threat. The mode of transmission of CDI is the ingestion of metabolically inactive spores which then colonize the gastrointestinal tract following a depletion of the normal gut flora. This depletion of normal gut bacteria commonly occurs following the administering of broad spectrum antibiotics. Furthermore, due to the persistence of these spores, one in five individuals treated for CDI experiences recurrent infection. To combat this, a large amount of research has been directed towards “next generation” probiotics (NGPs) capable of producing chemical compounds that are bactericidal but non-inhibitory to normal gut bacteria. Next generation probiotics include bacterial species *Lactobacillus reuteri* and yeast species *Debaryomyces hansenii*. Here, we present preliminary data using a potential NGP, *Debaryomyces hansenii*, showing its effect on the sporulation frequency of *C. difficile*.

### Biography:

Manish Kumar has obtained his PhD in Microbiology from Dr. RML Avadh University in the area of environmental biotechnology. His postdoctoral research was in the area of infectious diseases and antimicrobial resistance at University of Florida and University of Texas, Arlington. Currently a faculty member in Biology at Texas State University, he has published several original research articles, book chapters and conference presentation. He has developed courses on Microbial Biotechnology and bacterial genetics to expand the curriculum at Texas State University. He is also serving on the Texas higher education board as committee member for Biology Field of study since 2017.