Researchers at the University of South Florida have designed an oral vaccine effective against both *Clostridium difficile* toxins and *C. difficile* colonization.

*C. difficile* is a spore-forming anaerobic and toxin-producing bacillus. It is the most common cause of antibiotic-associated diarrhea in developed countries. *C. difficile* infection has surpassed *Staphylococcus aureus* as the most common hospital-acquired infection in the United States. A CDC study estimated 500,000 *C. difficile* infections with 29,000 deaths per year in the U.S. Treatment options for *C. difficile* infection are limited, due to antibiotic resistance, as well as other physiological factors of the bacteria such as spore formation. Consequently, there is a need for more effective therapies and prevention methods against *C. difficile* infection. Currently, no vaccines against *C. difficile* are licensed.

*C. difficile* infections are transmitted through spore form. The major virulent factors of *C. difficile* are two large protein toxins. USF researchers have designed an oral vaccine to protect users against *C. difficile* infection. This vaccine uses non-toxigenic *C. difficile* (NTCD) strains to carry non-pathogenic toxin fragments. These strains will not harm the user and do not generate the disease. These live vaccines (NTCD_138, NTCD_169) can target both *C. difficile* toxins and *C. difficile* colonization. This will inhibit main virulent factors of the pathogen and reduce distribution of the spores. Furthermore, the NTCD strains can be converted into a spore form, which can be used as an oral immunogen. The spore form is ideal because spores are resistant to harsh conditions and do not require cold storage. This novel vaccine has the potential to significantly improve current prevention and treatment methods for *C. difficile* infection.

**ADVANTAGES:**
- Targets main virulent factors
- Reduces distribution of toxigenic spores
- Improved efficacy
- No need for cold storage

**A Novel Oral Vaccine Against *C. difficile* Infections**

**100% Survival of Mice Infected with *C. difficile* Immunized with NTCD_Tcd138**

7 Days After Infection

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