Infectious Disease Prevention

VCU Innovation Gateway
Office of the Vice President for Research and Innovation

Type IV pilin genes & proteins

Identifying and treating Clostridium difficile disease

Clostridium difficile associated disease (CDAD) is a dangerous emerging infection caused by an anaerobic, spore-forming bacillus. While once found almost exclusively as a complication of antimicrobial therapy among the elderly and infirm in inpatient settings, CDAD has been increasingly reported among otherwise healthy outpatients, even in the absence of antimicrobial therapy. Due to the dramatic increase in severe cases and deaths attributable to CDAD, the current cost of treatment in the United states is now over $3 billion annually. While CDAD has previously been treatable with metronidazole or vancomycin, instances of metronidazole resistance cases are becoming increasingly common, and thus prevention should be prioritized. With no licensed vaccine currently available, VCU researchers are exploring the use of type IV pili as a vaccine component.

The technology

Type IV pili (Tfp) or fimbriae are hair-like surface appendages produced by many species of bacteria. Recently, VCU investigators have characterized the tfp genes present in the *C. difficile* genome. Our researchers have developed a method of inducing an immune response to *C. difficile* tfp as a means to prevent CDAD infection.

Benefits

- Can use a variety of type IV pili

Applications

- Prevent infection in individuals at high risk of *Clostridium difficile*
- Identify individuals infected with *Clostridium difficile*

Patents issued:

US 8,518,415 B2
US 2013/0337003 A1
US 9,802,988 B2

License status:

This technology is available for licensing to industry for further development and commercialization.

Category:

Biomedical

VCU Tech #:

19-122

Investigators:

Michael Donnenberg, M.D.

External resources:

Maldarelli, G.A., et al. (2016)
Piepenbrink, K. H., et al. (2015)
Maldarelli, G.A., et al. (2014)
Piepenbrink, K. H., et al. (2013)

Contact us about this technology

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