

# VACCINE TO PREVENT CATHETER-ASSOCIATED URINARY TRACT INFECTION

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[Caparon, Michael](#), [Flores-Mireles, Ana](#), [Hultgren, Scott](#), [Pinkner, Jerome](#)

[Poranki, Deepika](#)

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## **Technology Description**

Researchers at Washington University in St. Louis have developed a vaccine strategy to prevent catheter-associated urinary tract infections (CAUTIs). CAUTIs are the most common cause of hospital-acquired infections. Many of these are caused by *Enterococcus* bacteria. CAUTIs are very difficult to treat and treatment has been further complicated by the rise in antibiotic resistance. Thus, new therapies and preventative strategies are needed. To help meet this need the inventors took advantage of their work identifying the mechanism by which *Enterococcus faecalis* causes CAUTIs. They found catheterization causes the release of fibrinogen which is deposited on the catheter. The bacterial protein EbpA then mediates binding of the bacteria to the fibrinogen to enable formation of a bacterial biofilm on the catheter. Identification of this key step to infection allowed the inventors to develop a EbpA-based vaccine that prevented CAUTIs in mice. (*See below for model.*) The vaccine strategy provided by this technology may be developed into a much needed therapeutic to prevent or treat human CAUTIs.

## **Stage of Research**

- Using mouse models of CAUTI, the inventors showed that vaccination with EbpA inhibited biofilm formation *in vivo* and protected against CAUTIs.

## **Applications**

- Treatment and prevention of catheter-associated urinary tract infection (CAUTI)

## **Key Advantages**

- Solves an unmet need- provides a much-needed therapeutic strategy to treat or prevent CAUTIs
- Potential for use in other catheter-related and Ebp pilus-related diseases

## **Publications**

- Flores-Mireles AL, Pinkner JS, Caparon MG, Hultgren SJ. [EbpA vaccine antibodies block binding of \*Enterococcus faecalis\* to fibrinogen to prevent catheter-associated bladder infection in mice.](#) Sci Transl Med. 2014 Sep 17;6(254):254ra127. doi: 10.1126/scitranslmed.3009384.
- Purdy, M.C. [In mice, vaccine stops urinary tract infections linked to catheters.](#) The Source, a Washington University in St. Louis publication. 2014, Sept 17.

### **Patents**

- Issued US Patent [Compositions and methods for the treatment and prevention of Ebp pilus-related diseases](#) (9,839,682)
- Published US Patent application- [Compositions and methods for the treatment and prevention of Ebp pilus-related diseases](#) (US20180055923A1)

### **Related Web Links**

- [Hultgren lab](#)

### **Model of *E. faecalis* pathogenesis during CAUTIs**

