



## Protective Vaccine & Diagnostic for *Acinetobacter baumannii* Infection

### Overview

Bacterial infections often persist due to the formation of protective biofilms, which reduce the effectiveness of antimicrobial agents and immune effectors. *Acinetobacter baumannii* (*A. baumannii*) is an opportunistic, gram-negative bacteria that is associated with infections in health care settings and is estimated to be 2-10% of all gram-negative infections in intensive care wards. The control of *A. baumannii* has increasingly become challenging due to its ability to survive long periods of environmental exposure and the emergence of multi-drug resistant (MDR) strains. The emergence of MDR strains has created a clinical crisis with multiple reports of colistin as the therapeutic of last resort for bacterial clearance.

UMB investigators developed a candidate vaccine against *A. baumannii*, which consists of a unique set of bacterial antigens shown to be immunogenic in a rabbit infection model. Also in development is a new diagnostic test for *A. baumannii*. The diagnostic application uses the inventors' platform technology for detecting antibody response to infection in a point-of-care lateral flow assay format.

#### Investigators

Mark Shirtliff  
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#### Field

Vaccine  
Diagnostic

#### Applications

Hospital-associated infection  
Multi-drug resistance

#### Technology Status

Available for licensing  
& sponsored research

#### Patent Status

Patent pending

#### UMB Docket#

MS-2017-032

#### References

Harro JM, Allison DL,  
Calhoun JH, & Shirtliff ME  
(in press)

[Perez F & Bonomo RA.  
Vaccine. 2014 May  
7;32\(22\):2537-9.](#)



resistant strains. *A. baumannii* has been associated with chronic infections including ventilator-associated pneumonia, catheter-associated urinary tract infections, burns, endocarditis, and osteomyelitis, which are infections that establish and persist due to biofilm formation. The critical need for a vaccine against *A. baumannii* is for patients with such chronic infections, as well as military personnel at risk for trauma.

### Technology Background

UMB researchers screened for immunoreactive proteins expressed during *in vivo* infection in a rabbit model, and identified proteins uniquely expressed in the early stages of biofilm maturation. Circulating antibodies against the early biofilm phenotype may target and eradicate the bacterial community to prevent infection.

### Advantages

- Unique immunogens are promising vaccine targets and infection biomarkers
- Antigens derived from early biofilm may be the key to preventing infections

### Stage of Development

Vaccine: Studies are underway to validate UMB's candidate vaccine against *A. baumannii* in animal challenge models

Diagnostic: UMB's point-of-care diagnostic platform is in advanced development, based on detection of serum antibodies by lateral flow assay. The diagnostic product will be capable of detecting multiple pathogens (e.g., *Staph aureus*) and the addition of *A. baumannii* detection to the platform is expected to be straightforward.