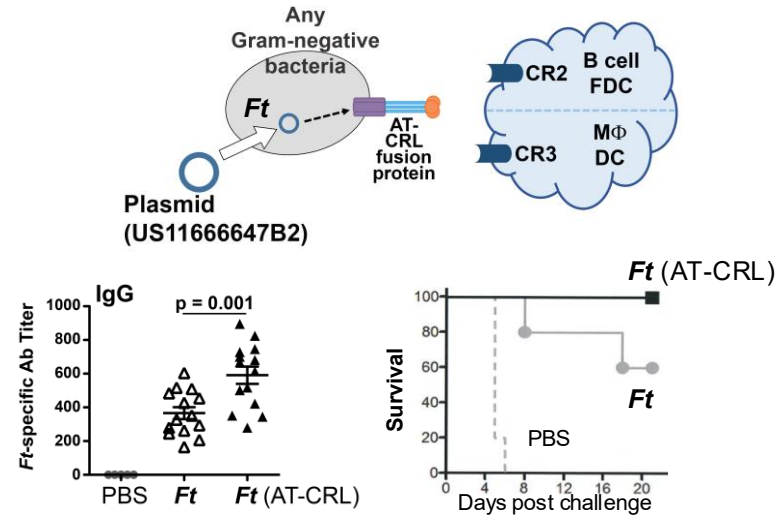


Surface display of receptor ligands by bacterial immunogens “complements” vaccine efficacy.

From Pathogen-to-Prophylaxis in a single step.

Background:

Vaccine development is often a lengthy and complex process, requiring the identification of specific antigens and the use of adjuvants to boost immune responses. This becomes particularly difficult for lethal pathogens like *Francisella tularensis* (Ft), which lacks an FDA-approved vaccine. With increasing antibiotic resistance in gram-negative bacteria, there's an urgent need for flexible vaccine strategies. Traditional methods that target specific antigens or strains may not provide broad protection, so there is a need for a simpler, more adaptable vaccine platform that can be quickly applied (Plug-and-Play) to both existing and emergent pathogens.



Immunization with AT-CRL bacteria yields superior antibody responses and survival in the face of lethal challenge.

Technology:

The new vaccine platform uses plasmid-encoded AT-CRL (AutoTransporter-Complement Receptor Ligand) fusions to target recombinant bacteria to immune cells via complement receptors (CR3 and CR2) on macrophages (MΦs), B cells, and dendritic cells (DCs). This platform involves transforming gram-negative bacteria such as *Escherichia coli*, *Klebsiella pneumoniae*, *Shigella flexneri*, and *Francisella tularensis* (Ft) to display CRLs, such as C3d or p28, on their surfaces. These CRLs engage complement receptors, promoting antigen uptake, signaling, phagocytosis, and enhanced antibody (Ab) production. This approach activates both innate and adaptive immune responses (mucosal and systemic), providing enhanced protection against infection. The platform can immediately be applied to variety of gram-negative bacteria, without the need for adjuvants, specific antigens, or the decades of knowledge typically required to develop new vaccines for existing and/or emergent pathogens.

Intellectual Property

US11666647B2

Technology Readiness

Available for licensing

Advantages:

- Simplified Vaccine Design
- Enhanced Immune Activation
- No Need for Adjuvants
- Potential for Combination

Applications:

- Universal Adjuvant-free Vaccine Development Platform

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