

## Safe Potent Single Platform Vaccine Against Tier 1 Select Agents and Other Pathogens

Tech ID: 30013 / UC Case 2016-992-0

### SUMMARY

UCLA researchers in the Department of Medicine have developed a novel vaccine platform against Tier 1 Select Agents to prevent infectious diseases such as tularemia, anthrax, plague, and melioidosis.

### BACKGROUND

Tier 1 Select Agents are infectious agents that pose a severe threat to the public and can cause diseases such as tularemia, anthrax, plague and melioidosis. Select Agents classified as Tier 1 present a high level of risk as they can be weaponized and cause high mortality if employed by bioterrorists. Even with appropriate antibiotic treatment, patients who acquire pneumonic tularemia, anthrax, plague or melioidosis suffer extremely high mortality rates. Despite the high risks posed by these bacteria, there is a lack of vaccinations available to protect humans and animals from Tier 1 Select Agents. Currently there is no licensed, FDA-approved vaccine for tularemia, plague, or melioidosis available in the USA (according to the CDC). While there is a vaccine combating anthrax (Anthrax Vaccine Adsorbed), it is cumbersome to administer and suboptimally protective, requiring 5 doses followed by annual boosters with unknown duration of efficacy. This situation leaves humans and animals susceptible to bioterrorism by Tier 1 Select Agents and does not provide options for infection prevention.

### INNOVATION

UCLA researchers have developed a versatile vaccine platform for preventing infections caused by Tier 1 Select Agents. This platform vaccine can be administered intradermally, subcutaneously, intramuscularly, intranasally, by inhalation, or orally. Compared to other unlicensed live vaccine strains, this invention is much safer and can induce a strong immunogenic response in the recipient. The easily cultured vaccine is inexpensive to manufacture in large quantities and does not require expensive purification. Additionally, the single platform design allows for manufacture of the various vaccines by identical methodology and for vaccination against multiple pathogens at the same time and with the same vaccination schedule, reducing cost, simplifying regulatory approval, and enhancing its attractiveness to patients.

### APPLICATIONS

- ▶ Vaccination against infections caused by Tier 1 Select Agents

### ADVANTAGES

- ▶ Can be administered by multiple routes (intradermally, subcutaneously, intramuscularly, intranasally, by inhalation, or orally)
- ▶ Low toxicity – much lower than other live vaccine strains
- ▶ Highly immunogenic; induces robust immune responses in B and T-cells
- ▶ Single platform allows vaccination against multiple pathogens simultaneously
- ▶ Less costly to manufacture and administer than multiple disparate individual vaccines
- ▶ Can be modified to accommodate other Tier 1 Select Agent antigens

### STATE OF DEVELOPMENT

This invention has been developed and tested in mice.

### RELATED MATERIALS

- ▶ Jia, Q., R. Bowen, B.J. Dillon, S. Masleša-Galic, B.T. Chang, A.C. Kaidi, and M.A. Horwitz. 2018. Single vector platform vaccine protects against lethal respiratory challenge with Tier 1 select agents of anthrax, plague, and tularemia. *Scientific Reports* 8:7009. May 3, 2018.

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### INVENTORS

- ▶ Horwitz, Marcus A.

### OTHER INFORMATION

#### KEYWORDS

Tier 1, Select Agents, Vaccines, Antigen, T cells, Bioterrorism, Tularemia, Anthrax, Plague, Melioidosis, Infection, Francisella tularensis, Bacillus anthracis, Yersinia pestis, Burkholderia pseudomallei

#### CATEGORIZED AS

- ▶ **Medical**
  - ▶ Disease: Infectious Diseases
  - ▶ Vaccines

#### RELATED CASES

2016-992-0

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,224,647	01/18/2022	2016-992
European Patent Office	Published Application	3490594	06/05/2019	2016-992

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Safe and Potent Vaccines against Tularemia](#)
- ▶ [Novel Live Recombinant Booster Vaccine against Tuberculosis](#)
- ▶ [Nanoparticles For Specific Detection And Killing of Pathogenic Bacteria](#)

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