



## Inventors

### Melha Mellata

Assistant Research Professor  
The Biodesign Institute  
Arizona State University

## Recombinant Bacterium Comprising a Toxin/Antitoxin System as a Vaccine Vector

AzTE Case # M11-009

## Invention Description

Live attenuated vaccines are considered among the most powerful tools for disease control and potentially disease eradication. Although vaccines have made a major contribution to public health, there are still significant deaths from diseases for which vaccines are not available. There is a need to develop better, safer, and cheaper vaccines capable for promoting long-lasting protection.

Melha Mellata at the Biodesign Institute at Arizona State University has developed compositions and methods for using regulated, toxin/antitoxin systems in live *Salmonella typ.* bacterium as a directed anti-cancer treatment and for antigen delivery. Antigen delivery and cells lysis are achieved at designated sites in host cells by controlling the ratio of toxin and antitoxin present in the host cell with appropriate promoters. Moreover, to insure the eradication of tumor cells, this system will be designed to highly express toxins of toxin/antitoxin systems capable of causing apoptosis in cancer cells, while protecting normal cells from death by expression of its antitoxin.

This system can be modified to suit a number of different needs for antigen delivery. If successful this delayed-lysis system will improve the safety and the efficiency of live vaccines and confer an economic benefit by saving lives and billion of dollars to the health care.

## Intellectual Property

### Status:

Patent Pending

## Potential Applications

- Anti-cancer vaccine
- Antigen delivery

## Contact

Jack Geltosky, PhD

Senior Vice President  
Business Development, Life  
Sciences

Arizona Technology  
Enterprises, LLC (AzTE)

P: 480.884.1989

F: 480.884.1984

[JGELTOSKY@AZTE.COM](mailto:JGELTOSKY@AZTE.COM)

[HEALTHSCIENCES@AZTE.COM](mailto:HEALTHSCIENCES@AZTE.COM)

## Benefits and Advantages

- Allows vaccine/treatment vectors to specifically target the designed specific sites
- Low or no effect on other part of the host.