A Pathogen Subunit Display Platform, to Generate Immuno Responses and Vaccines

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Protein Surface Display Platform (4048)

• Technology
  – A ClyA-delivery platform that displays and enriches protein on the outer membrane vesicles (OMV).
  – The enterobacterial cytotoxin ClyA is expressed on OMV.
  – ClyA has an invasive phenotype in bacterial and mammalian cells.

• Advantages
  – Creation and screening of combinatorial libraries
  – Effective system for vaccine delivery, drug delivery, and protein surface display
  – Overcomes the lack of complete immune response associated with subunit vaccines
Pathogen-like Subunit System for Vaccine and Drug Delivery (5861)

- Technology: recombinantly engineered Pathogen-like Particles (PLPs) composed of:
  1. OMV alone, a potent adjuvant and carrier system for poorly immune subunit antigen
  2. *Escherichia coli* Nissle, EcN, probiotic strain and highly immunomodulatory, immunosuppressive strain of *E. coli.*

- Advantages
  - Addresses limitations of subunit vaccines by inducing both robust humoral and Th1-dominated cellular immunity
  - Vaccine solution for intracellular pathogens (viruses, intracellular bacterial pathogens, and cancers)
  - Lower risk compared to vaccination with whole bacteria or viruses
  - Economical to produce and easier to purify
In vivo proof of concept studies – PLP subunit vaccines

- Humoral Immunity

EcN-OMV platform generates robust humoral and cellular immune response in BALB/c mice vaccinated and boosted once with antigen-normalized.

Vaccine Market Overview

- $33 billion worldwide Vaccine market in 2013
- Projected growth to $85 billion by 2022
- Major segments: Infectious Disease, Cancer, Allergy, Others (includes physiological diseases such as diabetes and Alzheimer’s, as well as smoking cessation)

- **Key Market Gaps**
  - Pricing
  - Production: Manufacturers face bulk production constraints including process restrictions, technology lags, and purification procedures,
  - Technology for vaccine supply: effective cold chain distribution


- Cornell’s Technology addresses these key market gaps.

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