Naturally derived vaccine adjuvant and immunostimulant for use in humans and animals

Brief Description
Unique RNA molecule derived from defective viral genomes containing potent immunostimulatory and adjuvant properties

Inventor
Carolina Lopez, PhD

Problem
The vaccine industry is steadily moving away from live-attenuated and whole-pathogen products, mostly due to safety concerns. In fact, it is projected that by 2017, these two classes of vaccine products will no longer make up the majority market share of the industry (BCC Research). As this trend continues, there is a need for new adjuvants in the marketplace to help boost the immunogenicity of the modern vaccine. For 70 years the only approved adjuvant was aluminum, whose mechanism of action is still unknown. Over the years, many other adjuvants have been proposed but most have failed to be successful, at least in humans, due to toxicity, cost and stability.

Solution
Dr. Lopez has optimized a short RNA motif (DDO) contained in naturally occurring replication defective viral genomes which contains exceptional immunostimulatory activity. This motif is stable, short in length, lacks the ability to replicate and is easily produced. DDOs can be modified, and transferred to other RNAs and vaccine viral vectors to enhance their activity. In addition it can be combined with delivery/depot adjuvants for enhanced activity and targeting. While most classical adjuvants largely target the Toll-like receptor signaling pathway, the DDO operates through a distinct molecular pathway. This feature allows for the molecule to be used either singly or in combination with a traditional adjuvant for a synergistic effect. Taken together, this unique molecule is versatile in its applications and robust in its immunostimulatory capacity making it an ideal vaccine adjuvant.

Advantages
- Stable
- Cost effective
- Multiple delivery mechanisms
- Activates a non-Toll receptor signaling pathway
- Can be used alone or in combination with other adjuvants

REFERENCE MEDIA
Xu et al. mBio, 2015 Oct 6; 6(5):e01265-15

STAGE OF DEVELOPMENT-
Demonstrated in vivo and in vitro

INTELLECTUAL PROPERTY
PCT Pending

DESISHED PARTNERSHIPS
Co-development

LEARN MORE
Melissa Kelly
kellymel@upenn.edu
215-898-9877
Docket # 15-7499