



TECHNOLOGY

Novel Protein Targets For Anti-Tick Vaccines

OVERVIEW

Background

Lyme disease is transmitted primarily through tick-bites and caused by spirochaete *Borrelia burgdorferi*. By the 2014 Center for Disease Control (CDC) estimates, incidence of Lyme disease has grown in the US from ~11,000 cases in 1995 to over 30,000 cases in 2014. Recent estimates place the number of new cases at 300,000 annually. Worldwide the incidence is believed to span over 80 countries according to Lyme Disease Association estimate. Lyme disease is the fifth most common National Notifiable Disease in the US. Currently there is no preventive vaccine for humans against Lyme disease in the market. Possible interventions for preventing disease transmission may be targeted at human, reservoir host or vector (ticks) level. Vaccines against Lyme disease were developed in the 1990s, approved by the FDA and marketed commercially through late 1990s and early 2000s. However, lack of public acceptance and poor sales led to withdrawal of the vaccine from the market. A renewed push for Lyme disease vaccine development in the face of growing national and worldwide incidence is underway in the research and public health communities.

Innovative Technology

Researchers at University of Maryland have identified novel tick protein targets to prevent Lyme disease transmission. Pathogens colonized in tick salivary gland or gut are transmitted to the host within a short period of time through the syringe-like mouth parts of ticks during feeding. This innovation identifies three new target proteins with vital functions in ticks. Immunization of human or animal hosts against these proteins will activate specific antibodies that disrupt normal function of feeding during tick-bite and hence pathogen transmission. Due to the unmet need for the prevention of tick-borne diseases, this technology has potential to be commercialized in human and farm animal vaccine industries.

Advantages

- Ability to prevent Lyme disease transmission at an early stage
- Highly specific and unique target against tick-proteins

Applications

- Anti-Lyme disease vaccine for humans and animals (livestock)
- Potential for application to other tick species-borne pathogens

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Additional Information

INSTITUTION

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PATENT STATUS

Pending

EXTERNAL RESOURCES

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