

Sialostatin Mediation Controls Blood-feeding Success of the Tick *Ixodes scapularis*

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Technology description

This invention offers an environmentally friendly alternative to existing acaricides (pesticides), and relates to vaccines against tick bites and the pathogens that the ticks may transmit. Bites from the nymphal stage of *Ixodes scapularis* are associated with Lyme disease transmission in disease-endemic areas of central and eastern US. *Ixodes scapularis* nymphs are the key vector stage implicated in Lyme disease transmission, mainly due to their small size that makes timely detection difficult. Guinea pig vaccination against sialostatin L2, a secreted *Ixodes scapularis* salivary protein, can confer nymphal recognition and protection against the tick. Increased rejection rates, prolonged feeding time, and inflammation were observed in the vaccine group, indicating that a protective host immune response was elicited. Moreover, anti-sialostatin L2 titers correlate with weight reduction of nymphs by the end of feeding. These studies suggest that an essential action of sialostatin L2 can be blocked by host humoral immunity.

Market:

Tick-borne diseases have alarmingly increased over the past years worldwide, affecting both human and animal populations. Lyme borreliosis is the most common and prevalent vector-borne human illness throughout the northern hemisphere. In the U.S., Lyme disease cases are steadily on the rise, exceeding the 23,000 reported to the CDC in 2005; while in Europe, the estimated cases are more than 50,000, making it a growing public health problem. Apart from transmitting the Lyme agent, the same tick species, of the genus *Ixodes*, serve as vectors for a repertoire of other human disease pathogens, such as viruses that cause tick-borne encephalitis, protozoa that cause babesiosis, and bacteria that cause granulocytic anaplasmosis, Q-fever, and Mediterranean spotted fever.

Application area

Use of sialostatin L2 in a multi-component vaccine to protect against tick bites, and the pathogens that the ticks may transmit.

Advantages

Sialostatin L2 as an anti-tick vaccine will target the vector and therefore confer protection against all the pathogens that may be transmitted by the vector.

An environmentally friendly alternative to acaricides.

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Institution

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