Biomedical

VCU Innovation Gateway
Office of Research and Innovation

A Tick Disease Vaccine, Therapeutic, and Diagnostic

Anaplasma phagocytophilum (AP) is a tick-transmitted bacterium that causes human granulocytic anaplasmosis (HGA), an emerging disease that is rapidly becoming a world-wide problem. HGA can be fatal to both humans and animals if not treated. Recognized in 1999, when HGA became a reportable disease, the incidence has increased dramatically as the consequences of undiagnosed AP infection have been realized. AP also affects dogs, cats, horses, and sheep. Although AP poses a serious threat for both human and animal welfare, there are no existing vaccines or therapeutics that prevent or treat this devastating disease. Likewise, a more effective and reliable means for diagnosing HGA is needed.

The technology

Researchers at Virginia Commonwealth University have discovered three proteins (OmpA, Asp14 and AipA) on the AP surface that can be used to develop a vaccine, therapeutic or diagnostic test to protect against, treat or detect infection, respectively. Because AP uses these three proteins to cause infection as a vital stage in its life cycle, blocking them prevents both disease and AP survival. Also, targeting unique regions of OmpA, Asp14, and AipA is more specific than current diagnostic techniques, which tend to be cross-reactive. This novel technology can be applied to benefit human and animal health.

Benefits

- Can be used as a vaccine, therapeutic, or diagnostic
- More specific diagnostic – early diagnosis can prevent severe complications
- Multiple modes of administration: oral, IM, and bait
- Mechanisms of action – prevents establishment of infection and also disease transmission
- Can be combined with other vaccines – Lyme Disease

Applications

- Prevention vaccine against tick-transmitted pathogens
- Therapeutic for treating *A. phagocytophilum* infections
- Diagnostic test for *A. phagocytophilum*
- Human and veterinary applications

Patent status:
Patent issued: U.S. rights are available. 10,086,058

License status:
This technology is available for licensing to industry for further development and commercialization.

Category:
Biomedical

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11-111F, 14-001F

Investigators:
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Diagnostic has been validated in using sera from AP infected human patients, dogs, horses, and sheep

Contact us about this technology

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