VIRGINIA COMMONWEALTH UNIVERSITY

"Answering Public Demand for Action: A Tick Disease Vaccine, Therapeutic and Diagnostic"

VCU #14-001, #11-111

Applications

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

Advantages

- Satisfies the public's demand for action against tick-borne diseases
- 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
- Mechanism of action – prevents establishment of infection and also disease
- transmission
- Can be combined with other vaccines – Lyme Disease

Inventors

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Market Need

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.

Technology Summary

Researchers at VCU 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.

Technology Status

Patent Pending: U.S. and foreign rights available

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

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