

Characterization of blood coagulation inhibitor proteins for effective control of tick infestations

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The impact of ticks have been recognized and documented in ancient times from Egypt (1550 BC) to Greece (850 BC). Ticks are obligate hematophagous ectoparasites and have thus evolved intricate sequential mechanisms to circumvent hemostasis. This cascade is the target for various anti-coagulants from the South African soft tick species *Ornithodoros savignyi*. Advances in the production of recombinant vaccines against tick infestation and pathogen transmission, has been accelerated in recent years with new technologies such as expression library immunization (ELI) and interference RNA [1][2].

The nucleotide sequence for the platelet aggregation inhibitor, apyrase, from a conserved consensus sequence of related proteins (Mans, B.J., personal communication), has been used in RACE protocols to obtain the sequences of two isoforms of this protein. Thus far functional expression of tick proteins in high abundance has been a hampering factor. The recombinant expression of the apyrase proteins and a factor Xa inhibitor, fXaI, is currently under investigation. Characterization and functional expression of these proteins, may pave the way for novel vaccine design.

[1]Almazan, C., Kocan, K.M., Bergman, D.K., Garcia-Garcia, J.C., Blouin, E.F., de la Fuente, J.(2003). Identification of protective antigens for the control of *Ixodes scupularis* infestations using cDNA expression library immunization. *Vaccine*, 21, 1492-1501.

[2] Narasimhan, S., Montgomery, R.R., DePonte, K., Tschundi, C., Marcantonio, N., Anderson, J.F., Sauer, J.R., Cappello, M., Kantor, F.S., Fikrig, E. (2004). Disruption of *Ixodes scupularis* anticoagulation by RNA interference. *Proceedings of the National Academy of Science*, 101, 1141-1146.