

Promoter Polymorphisms within Strains of *Anaplasma marginale* and Tick Transmission Status

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Anaplasma marginale is a bacteria in the order Rickettsiales that clinically affects cattle worldwide. Most strains of *A. marginale* are transmitted by ticks for example; St. Maries, South Idaho, 6DE, and EMX, however, the Florida strain is not transmitted by ticks. There is great diversity between strains and by comparing the genome sequences of tick transmitted to non-tick transmitted strains a list of candidate genes potentially involved in tick transmission can be made. By determining the gene(s) associated with tick transmission it may help to guide research for preventing the spread of disease. A comparative genomics approach comparing three tick transmissible strains (St. Maries, Puerto Rico, and Virginia) with the non-tick transmissible Florida strain produced a candidate list of 61 putative promoter polymorphisms that segregated with transmission status. This research project evaluated these 61 promoter single nucleotide polymorphisms (SNPs) in three tick transmitted strains, including South Idaho, 6DE, and EMX, against the Florida strain. SNPs that were the same as the Florida strain were eliminated as a candidate, but if all three strains showed a different base pair in that position then they were included as a candidate. A total of 19 SNP's were found to be candidates, which corresponded to 12 promoter regions that could affect 14 genes. Additional testing will include quantitative RT-PCR to evaluate the transcriptional status of the genes in St. Maries and Florida strains to determine if there are significant transcriptional differences between the strains.