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Control and eventual elimination of PRRSV via development of an effective DIVA vaccine

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Disclosure: Harris and Erdman are founders of Sirrah Bios, a start-up vaccine company which is developing both PRRSV and SIV recombinant vaccines

The USDA PRRS Coordinated Agricultural Project (PRRS CAP) (www.prrs.org), Murtaugh et al.,¹ and Rock² have indicated a need for an effective DIVA vaccine for prevention of PRRSV which could lead to eradication of the virus. Scientists world-wide are addressing this goal by developing either modified live virus (MLV) gene deleted or recombinant subunit or recombinant vector vaccines.

Sirrah Bios has chosen the path of developing and evaluating recombinant vaccines which consist of either PRRSV subunit proteins in adjuvant or virus-like replicon particles that express subunit proteins of PRRSV. In addition, Sirrah Bios vaccines will be DIVA (compatible with IDEXX ELISA) as well as contain compliance markers (companion test under development).

These recombinant vaccine approaches do not involve live viruses and thus do not provide the potential for reversion to virulence as with MLV vaccines. Furthermore, these recombinant vaccines can be produced containing no nucleocapsid proteins from Open Reading Frame (ORF) 7 of the PRRSV and thus are compatible with the IDEXX ELISA. In addition, these recombinant vaccines do not require MARC 145 cells for production.

Osorio et al. discovered that pregnant gilts passively immunized with virus neutralizing (VN) antibodies to PRRSV were protected (sterilizing immunity) against challenge with the virus.³ Structural proteins glycoprotein (GP) 3, GP4, GP5, and matrix (M) have been reported to contain neutralizing epitopes of PRRSV.⁴ Erdman et al. and Jiang et al. have shown in independent studies that the immunization of pigs with GP5 and M proteins as a heterodimer is protective against PRRSV challenge.⁵⁻⁷ Harris and Erdman in research conducted at Iowa State University found the basis for the development of recombinant heterologous protective VN antigens for the PRRSV.⁸ Recently, workers in China have suggested that recombinant expressed GP3 and GP4 proteins combined with GP 5 protein may be important in inducing protective immunity to PRRSV.^{9,10}

Work is on-going at Sirrah Bios, ISU and AlphaVax for the development of effective recombinant DIVA/Marker

vaccines for control of PRRS and SIV. Research results will be presented.

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