

SWINE HEALTH

Title: Fluorescent *in situ* hybridization for the detection of novel pathogenic *Brachyspira* spp. in porcine colonic tissues - **NPB# 12-192**

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Scientific Abstract:

Swine dysentery is classically associated with infection by *Brachyspira hyodysenteriae*; however, the proposed novel species '*Brachyspira hampsonii*' has recently been isolated from clinical cases of dysentery in North America. Selective anaerobic culture is a highly sensitive method for detecting *Brachyspira* in clinical samples but requires several days for completion often followed by molecular testing for speciation. Alternatively, *in situ* hybridization applied to sections of formalin-fixed tissue can provide rapid, culture-independent identification of pathogens observed histologically. In this study, a fluorescent *in situ* hybridization assay was developed for confirmation of a clinical diagnosis of swine dysentery associated with '*B. hampsonii*' infection. An oligonucleotide probe (Hamp1210) targeting 23S rRNA of '*B. hampsonii*' was developed after sequence analysis and comparison of numerous *Brachyspira* spp. clinical isolates with reference sequences available in GenBank. Application of Hamp1210 and a previously published probe for *B. hyodysenteriae* (Hyo1210) to diseased colonic tissues from pigs successfully detected the target species in both experimentally infected pigs and naturally infected pigs, and the Hamp1210 probe consistently detected both clade I and clade II isolates of '*B. hampsonii*'. *In situ* hybridization incorporating these probes can reduce the delay from sample submission to pathogen identification in cases of swine dysentery where formalin-fixed tissues are available.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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