The Cummings School of Veterinary Medicine
Tufts University
200 Westboro Road
North Grafton, Massachusetts
2014-2015 Annual Report of Research Facility
Registration Number: 14-R-0065
Customer Number: 628
November 22, 2016

Explanation for Column E:

In this protocol, the life cycle of tickborne pathogens using simulated natural cycle of transmission is studied. We seek to simulate the natural cycle as much as possible and artificial feeding would not simulate the processes of inflammation, cell recruitment, hormonal milieu, etc. that may be critical for optimal pathogen transmission. Antibiotics or antipyretics cannot be administered because we seek to maintain the infections in as natural a manner as possible. We have yet to be able to efficiently infect ticks and maintain the full life cycle of any of the agents we study without needing a living animal host.
Species: Hamster Number: 77

The goal of this protocol is to produce *Cryptosporidium* sp. oocysts for laboratory based studies, to maintain the viability of theses isolates via animal passage, to study how cryptosporidiosis is caused and to identify treatments and/or prevention of the disease. Although *Cryptosporidium* sp. infection is responsive to the antibiotic, paromomycin, treatment of animals with this drug would eliminate the infection, such that the oocysts would no longer be shed in the feces. Anti-diarrheal drugs would also be expected to affect the pathogenesis of *Cryptosporidium* sp. infection, including oocyst shedding, thereby similarly inhibiting the ability to obtain oocysts. Administration of analgesics would be expected to alleviate the gastrointestinal and abdominal discomfort associated with cryptosporidial diarrhea. However, analgesics may also affect gastrointestinal motility and/or oocyst production and shedding.
Species: Cattle Number: 1

The Sereny model of keratoconjunctivitis using guinea pigs is a standard model used for evaluating the efficacy of candidate *Shigella* sp. vaccines. This study uses this animal model to evaluate the efficacy of the antibody-based candidate therapeutics. Currently, there is no vaccine available, *Shigella* isolates are often resistant to multiple antibiotics, and therapeutic options are limited. We are interested in developing an antibody-based therapeutic effective against all species and serotypes (sub-species) of *Shigella*. Any treatment of the infection would negate the purpose of this study.
Species: Guinea Pig Number: 10

The goals of this protocol are to stimulate production of antibodies against selected antigens derived from bacteria, protozoa, bacterial toxins, viruses, fungi, guinea pig proteins and shrimp protein; harvest serum from animals producing antibodies as a source of these antibodies; and isolate the B cells capable of producing these antibodies. Rabbits will be used for antiserum production under this protocol. Antiserum generation may involve the administration of biological toxins to these rabbits in an effort to refine and enhance the immune response against the native epitopes present in these toxins. The in vivo effects mediated by biological toxins are often responsive to administration of specific antiserum if administered early enough following toxin exposure. However, treatment with antiserum would eliminate the activity of the biological toxin and thus interfere with the ability of the biological toxin to stimulate the immune system. Anxiolytics may be useful in minimizing the stress associated with the sensation of intoxication. However, it is unknown what effect these substances may have in conjunction with each of the toxins utilized and what effect they may have on the immune response to these toxins. Thus, such substances will not be used.
Species: Rabbit Number: 4

Adult hard ticks that are endemic to New England will not feed on rodents. Adult ticks are the reproductive stage; maintaining a flourishing colony of ticks requires efficiently feeding adult ticks so that they will lay eggs and perpetuate the colony. We seek to increase our production of deer ticks that may be considered specific pathogen free, and the only means of doing so, is to feed them on rabbits. Our colonies of specific pathogen free deer ticks are in increasing demand due to clinical trials. Current studies seek to understand the biological basis of Post Treatment Lyme Disease Syndrome (PTLDS), the safety of feeding colony-derived larval deer ticks on human volunteers, and other studies that need pathogen free deer ticks. Tick feeding may be distressful to rabbits. Sedation or analgesia may alleviate this distress, but it is to be avoided due to the possibility of disrupting tick feeding, which is the goal of this protocol.
Species: Rabbit Number: 1

The objectives of this project are 1) to develop a vaccination and challenge model for C. difficile in germfree or normal pigs; and 2) to test new therapies and vaccines for C. difficile. Pigs infected with C. difficile may experience unrelieved pain or distress due to gastrointestinal or systemic illness. While the clinical manifestations of C. difficile may be treated by administration of antibiotics, and the pain and inflammation resulting from infection may be partially relieved by administration of analgesics or anti-inflammatory drugs, this would resolve the infection and diminish the host response that is being studied, and would thus negate the purpose of the study.
Species: Swine Number: 12

The goals of these protocols are to passage *Cryptosporidium* sp. within piglets in an effort to evaluate the species specificity of *Cryptosporidium* sp., to propagate the infectious form of this parasite, namely the oocyst, for laboratory-based studies and to develop a vaccine for prevention of *Cryptosporidium* sp. Although infection with *Cryptosporidium* sp. is responsive to the antibiotics, paromomycin and nitazoxanide, treatment of piglets with these drugs would eliminate the infection and subsequent

oocyst shedding. Administration of anti-diarrheal drugs would also be expected to eliminate the diarrhea that occurs as a result of *Cryptosporidium* sp. infection. Elimination of the diarrhea would similarly reduce fecal oocyst shedding. Administration of analgesics would be expected to alleviate the gastrointestinal and abdominal discomfort associated with cryptosporidial diarrhea. However, analgesics may also affect gastrointestinal motility and/or oocyst production and shedding and therefore cannot be used. Also, decreasing oocyst shedding, clinical signs and/or diarrhea may obscure our ability to identify the most effective vaccine preparation.
Species: Swine Number: 132

Pigs infected with Zika and/or Dengue may experience unrelieved pain or distress due to fever and additional symptoms. There are currently no therapeutic treatments available for Zika or Dengue virus infection. It may be possible to partially relieved pain or distress by administration of analgesics or anti-inflammatory drugs, however this may diminish the host response that is being studied, and would thus negate the purpose of the study.
Species: Swine Number: 2

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Death as an endpoint:

No studies to report for October 1, 2015-September 30, 2016.