INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE
TUFTS UNIVERSITY & TUFTS MEDICAL CENTER
T: 617-636-0496 **email:** iacuc-office@tufts.edu
Website: http://viceprovost.tufts.edu/iacuc/home/

2018-2019 Annual Report of Research Facility
Registration Number: 14-R-0065
Customer ID Number: 628

Explanation for Column E:

In this protocol, the life cycle of tickborne pathogens using simulated natural cycle of transmission is studied. Ticks are obligate parasites, meaning they require blood to develop or reproduce. By bloodfeeding, these arthropods acquire and transmit certain infectious agents. Rodents are the natural hosts for the immature stages of the ticks that we study and these ticks are thus best studied and maintained on these animals. In addition, rodents are the natural hosts for the various infectious agents that we study. Although elements of the life cycles of the infectious agents or their tick hosts might be studied by the use of in vitro methods, the entire life cycles are not achievable by such replacements or refinements. 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. Also, we seek to determine whether some strains of Powassan/deer rick virus may be more neurotropic. This requires observation of neurologic disease. There is no known treatment for deer tick virus encephalitis (nor for any other flaviviral encephalitis). It may be possible to partially relieve pain or distress by administration of analgesics, anti-inflammatory or anti-emetic drugs, but this may diminish our ability to detect clinical signs and hence our ability to euthanize as soon as possible.
Species: Hamster Number: 38 Species: Guinea pig Number: 2

In this protocol, a comprehensive study of the transmission dynamics of the infectious agents within these ectoparasites are studied. Because humans and rodents increasingly interact, studies of the natural history of infectious agents that depend on rodents and their ectoparasites may help us devise interventions against those that are known to be a public health burden (e.g. Lyme disease) or whether rare infections (Rocky mountain spotted fever, tularemia, deer tick virus encephalitis) may emerge to

become public health burdens. These ticks are natural vectors for spotted fever, tularemia, Master's disease, ehrlichiosis, and Powassan encephalitis. We need to trap animals because they are naturally infected with ectoparasites of public concern, commonly serve as a source of infection for the ticks or as a source of contamination of peridomestic environments. Animals may be restrained within live traps for several hours without free access to water to reduce risk of hypothermia, but bait such as peanut butter or oats is provided. The presence of humans would not be conducive to successful trapping.
Species: Wild Mice/Peromyscus Number: 95 Species: Shrew Number 10 Species: Vole Number: 6 Species: Chipmunk Number: 4; Species: Rabbit Number: 2

The swine and hamsters are used in this study to establish a model, and evaluate the efficacy of candidate vaccines for infectious diseases caused by *C. difficile*, *Shigella* sp. and *Cryptosporidium* sp. Infected animals may experience unrelieved pain or distress due to gastrointestinal or systemic illness. While the clinical manifestations of the disease may be treated by administration of antibiotics, and 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 we are trying to study and would thus negate the purpose of the study.
Species: Swine Number: 64 Species: Hamster Number: 38

The objectives of this study are to develop and evaluate a surgically implanted stomach/small intestine tube in rabbits, use that tube to repeatedly deliver antibody agents into the small intestine of rabbits and develop a rabbit gut loop model to assess the intestinal pharmacokinetics of antibody agents. It will be used to deliver antibody agents to rabbits to treat Enteropathogenic E. coli (EPEC) diarrhea and evaluate the efficacy of the treatment. The rabbits will be infected with REPEC, a rabbit species specific strain of E. coli. Such a strain is expected to induce diarrhea and the rabbits may become weak and dehydrated. The only means by which to abrogate development of the expected adverse effects is to administer antibiotics to which this E. coli strain is susceptible. Unfortunately, this would eliminate the E.coli infection. Given that the basis of this study relies on in vivo infection with this E. coli strain, administration of such antibiotics would obviate the purpose of this study. Administration of anti-diarrheal drugs or analgesics would be expected to eliminate the diarrhea and/or abdominal/ gastrointestinal pain associated with this diarrhea. Given that one of the goals of this study is to evaluate the effect of E. coli-associated virulence factors, reduction or elimination of these clinical signs would inhibit the ability to evaluate the effect of the virulence factors.
Species: Rabbits Number: 28

The gnotobiotic piglets used in this study will be orally infected with strains of *Salmonella* sp. Such strains are expected to induce diarrhea. As a result, these piglets may also become weak and dehydrated. All of the potential adverse effects that may be

seen are related to *Salmonella* sp. infection. The only means by which to abrogate development of the expected adverse effects is to administer antibiotics to which these *Salmonella* sp. strains are susceptible. Unfortunately, this will eliminate the infection. Given that the basis of this study relies on in vivo infection with these strains, administration of such antibiotics would obviate the purpose of this study.
Administration of anti-diarrheal drugs or analgesics would be expected to eliminate the diarrhea and/or abdominal/gastrointestinal pain associated with this diarrhea. The main goal of this study is to utilize gnotobiotic piglets as a non-primate model of *Salmonella* sp. infection. Administration of anti-diarrheal drugs would likely inhibit or affect *Salmonella* sp. growth and thus, infection, thereby interfering with our ability to assess the establishment of this model and efficacy of vaccine candidates.
Administration of analgesics may result in elimination or alteration of the clinical signs which we are monitoring as a means to evaluate efficacy of candidate vaccines.
Species: Swine Number: 12