

Species: Hamster                      Number: 18

- Hamsters used to study of the life cycle of tickborne pathogens utilizing the simulated natural cycle of transmission. Ticks require blood to develop and reproduce. During that process, they acquire and transmit certain infectious agents. Rodents are natural hosts for the immature stages of the ticks being studied and the natural hosts for the various infectious agents being studied. The lab seeks to simulate the natural cycle as closely as possible, and artificial feeding would not simulate the processes of inflammation, cell recruitment, hormonal milieu, etc. critical for optimal pathogen transmission. Antibiotics or antipyretics cannot be used because the infections need to be maintained in as natural a manner as possible. In addition animals are used to determine whether some strains of Powassan/deer tick virus may be more neurotropic, which requires observation of neurologic disease. There is no known treatment for deer tick virus encephalitis or for any other flaviviral encephalitis. The provision of analgesics, anti-inflammatory or anti-emetic drugs for pain/distress may diminish the ability to detect clinical signs and hence the ability to euthanize as soon as humane endpoints are reached.

Species: Hamster                      Number: 138

- Hamsters used to study in vivo infection with *C. difficile* strains and evaluate the efficacy of vaccines, therapeutic agents, and host immune responses to infection. *C. difficile* infection can induce diarrhea, resulting in weakened and/or dehydrated animals. The only means by which to abrogate development of adverse effects would be to administer antibiotics, which would eliminate the *C. difficile* infection and obviate the purpose of the study.

Species: Rabbit Number: 1

- Adult hard ticks 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. Ticks were feed on rabbits to produce specific pathogen free (SPF) ticks. There is growing evidence that the tick microbiome influences vector competence for Lyme disease spirochetes and perhaps others. Additionally, tick salivary components enhance infectivity of tick-transmitted pathogens and there is a great demand for tick salivary glands or saliva. The SPF tick colony is reserved mainly for clinical use; engorged ticks harvested from deer are used for experiments in which the microbiome may be influential, but the source (hunter harvested deer) is not reliable. Accordingly, rabbits were used to feed field-collected ticks. Tick feeding may be distressful, however, sedation/analgesics were not used because they can disrupt tick feeding which is the goal of this study and their effects on tick feeding are not known.