

THE INFLUENCE OF HOST SEX ON TRANSMISSION DYNAMICS OF THE FRIEND VIRUS COMPLEX

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This study focused on characterizing influence of biological sex on natural transmission dynamics in viruses – specifically the Friend Virus Complex (FVC) within its natural host, the house mouse (*Mus musculus*). Despite it being a model pathogen there are no population-level reports detailing natural transmission dynamics of FVC. The overarching objective of this study is to characterize FVC transmission dynamics and describe the influence of host sex. We first set up three replicate populations of wild house mice wherein half of the animals are infected via IP injection with FVC (index animals) and the other half are uninfected (contact) animals. Therefore, to quantify transmission frequency we simply determined the percentage of mice that become infected that were not so initially (contact animals). Two other sets of populations were established; one where only half of the males were index animals and another where only half of the females were index animals; this design allowed us to determine if one sex drives transmission. We found that that males are 1.67 times more likely to contract FVC within populations (GLMM; $Z = -2.53$, $P = 0.001$; Figure A). Populations that contained only index males had transmission rates 2.04 times higher across all contacts than those containing only index females (GLMM; $Z = -2.96$, $P = 0.003$, Figure B), while populations with only male index animals did not differ from populations containing index animals of both sexes (GLMM; $Z = 1.03$, $P = 0.303$). These data indicate males are the main transmitters of FVC within populations; this system could serve as a model in understanding sex-biased pathogen transmission dynamics within vertebrate populations such as many human sexually transmitted infections.

