M544 for susceptibility testing. Groups of three deer mice were euthanized for necropsy and tissue collection on days 2, 4, 7, 11, 21, and 31. No conspicuous signs of disease occurred in the deer mice; however, minor pulmonary multifocal vasculitis and hemorrhages, multifocal portal hepatis and splenic lymphoid hyperplasia with hemosiderosis were detected in several deer mice. No virus was detected in sera, suggesting viremia did not occur. Neutralizing antibody was detected as early as day 7-post inoculation, and thereafter all deer were seropositive. MODV RNA was detected by PCR in organs of deer mice euthanized between days 2 and 4, with lung tissue of one deer mouse euthanized on day 7 also indicating the presence of MODV RNA. Viral RNA was detected in most spleens but less frequently in the kidneys and hearts. These data indicate deer mice are susceptible to MODV without signs of disease, although mild pathology occurs in some organs. Clearance of the virus is suggested by the PCR results since no virus was detected in any organ tissue beyond 7 days, which is contrary to the expectation of a natural reservoir host.

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Assessing Mother to Offspring Transmission of Chronic Wasting Disease Using Transgenic Mouse Models

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Chronic wasting disease (CWD) is the transmissible spongiform encephalopathy (TSE), or prion disease, of free-ranging and captive cervids (deer, elk and moose). The presence of sufficient infectious prions in the tissues, bodily fluids (urine, saliva, and blood) and environments of clinical and preclinical CWD-infected animals is thought to account for its high transmission efficiency. Recently it has been recognized that transmission from mother to offspring may contribute to the facile transmission of some TSEs. Although the mechanism of maternal transmission has yet to be elucidated, the extended asymptomatic TSE carrier phase, lasting years to decades, suggests that maternal transmission may have implications in the spread of prions.

Placental trafficking and/or secretion in milk are two means by which maternal prion transmission may occur. In these studies we explore CWD maternal transmission during early and late CWD infection using a transgenic mouse model (TgCerPRP) expressing cervid prion protein. Naïve and CWD-infected dams were bred during early (45 dpi) and late (120 dpi) infection and were allowed to bear and raise their offspring. Milk was collected from the dams for prion analysis, and the offspring were observed for TSE disease progression. Terminal tissues harvested from these dams and offspring were analyzed for prions.

We have demonstrated: 1) that CWD-infected TgCerPRP females successfully breed and bear offspring, 2) the presence of PrP\textsuperscript{CWD} in reproductive and mammary tissue harvested from CWD-infected dams, and 3) clinical disease progression in offspring born to CWD-infected dams. We are currently analyzing terminal tissue harvested from offspring born to CWD-infected dams for the detection of PrP\textsuperscript{CWD} and amplification competent prions. These studies will provide insight into the potential mechanisms and biological significance associated with mother to offspring transmission of TSEs.

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Serological evidence that Tacaribe virus is circulating among bats in Trinidad and Tobago

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Tacaribe virus (TCRV) is a bisegmented, ambisense, RNA virus within the genus Arenavirus. Arenaviruses are grouped into Old World lymphocytic choriomeningitis-Lassa virus complex and the New World Tacaribe complex viruses. TCRV is placed within the Tacaribe complex along with the South American hemorrhagic fever viruses: Chapare, Guanarito, Junin, Machupo, and Sabia viruses. The only isolates of TCRV were from 11 artibeus bats collected by investigators at the Trinidad Regional Virology Laboratory in the Republic of Trinidad in the 1950s. TCRV has not been isolated since, although serological data from the 1970s suggested it may circulate among Caribbean bats. Only one isolate remains, TRVL-11573, and it has been passaged in suckling mice and Vero cells. We sought to determine if TCRV is still circulating in bat populations in Trinidad through serological investigation. We developed an ELISA and western blot assay using His-tagged recombinant TCRV nucleocapsid antigen. Serum from Artibeus jamaicensis that had been experimentally infected with TCRV was used as a positive control, and serum collected from an uninfected A. jamaicensis used as a negative control. ELISA screen of bloods from 84 bats of various species captured in Trinidad identified several, mostly artibeus bats, as seropositive for antibodies to TCRV. Some of these were tested by western blot. Four were negative, eight were weakly positive, and five were strongly positive. These results suggest that TCRV or other arenaviruses continue to circulate among bats in Trinidad.

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Assessing Milk from CWD-Lactating Deer for Infectious Prions

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Transmissible spongiform encephalopathies (TSEs), or prions, cause a fatal neurodegenerative disease affecting mammals including bovine spongiform encephalopathy (BSE) in cattle, scrapie in sheep, variant Creutzfeldt-Jakob disease in humans and chronic wasting disease (CWD) in deer, elk and moose. CWD, the only prion disease to infect a native free-ranging population, has now been detected in 22 American states, 2 Canadian provinces and South Korea. While horizontal transmission is credited for much of the spread of CWD, few studies have monitored the potential for vertical/maternal transmission with an emphasis on lactation. Using a small, polyovestrix calf—the Reeves’ muntjac deer—we are addressing this issue by supplementing naïve Reevere’s muntjac fawns (n = 5) with milk collected from CWD-inoculated, preclinical and clinical muntjac doe. Blood, saliva, feces, urine and lymphoid biopsies will be collected from milk-exposed fawns at 10d, 21d, 40d, 3mo, 6mo, 12 and 18 mo pi to aid in CWD diagnosis. Similar samples, with the addition of mammary biopsy, will be collected from each mother doe at 3 months intervals to monitor CWD status. CWD fawn and mother doe CWD status will be monitored by immunohistochemistry, real time quaking induced conversion assay (RT-QuIC), protein misfolding cyclic amplification (PMCA) and clinical disease progression. The results of this study will establish: 1) if there are sufficient infectious prions in the milk of lactating doe to transmit disease to offspring and 2) if mother to offspring transmission plays a role in the high efficiency with which CWD is transmitted in nature.

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