

Corynebacterium kutscheri (Pseudotuberculosis)

Classification

Gram-positive, small, rod-shaped bacterium

Family

Corynebacteriaceae

Affected species

Rats, mice, hamsters. Possibly all laboratory rodents, but not described in gerbils, and only described once in guinea pigs.

Frequency

Rare in laboratory colonies. Described as a natural infection in *R. norvegicus*, but prevalence in wild and pet populations unknown.

Transmission

Transmission of *C. kutscheri* is probably primarily fecal-oral. In experimental infections, animals can shed bacteria in feces for up to 5 months, and infection is persistent; animals do not clear the infection. Different strains of mice vary in susceptibility to both colonization and disease development in mice, with C57BL/6 mice resistant and BALB/c susceptible. Sex also plays a role; male mice appear to be more susceptible to disease and to carrier states as well. There is one report in the literature of human *C. kutscheri* infection in an infant after a bite from an infected rat.

Clinical Signs and Lesions

Inapparent infection is common. Animals can harbor *C. kutscheri* in the oral cavity, cervical lymph nodes, and gastrointestinal tract with no ill effects. With advancing age, stress, experimental manipulation, or any derangement of the immune system, hematogenous spread may occur. When clinical signs occur, they are nonspecific general signs of illness – weight loss, ruffled fur, and, in rats, respiratory distress and chromodacryorrhea.

Typical gross findings in *C. kutscheri* infection are raised, grey-white nodules primarily seen in the liver, kidney, and lungs in mice and in the lungs in rats. These

nodules may be up to one cm in diameter, although they are generally smaller. These nodules are found less commonly in other areas in the animal, including the subcutaneous tissue, joints, spleen, and lymph nodes. On microscopic examination, the lesions have a necrotic center (coagulative to caseous necrosis) surrounded by a peripheral accumulation of neutrophils. Organisms are readily apparent in these suppurative lesions.

Diagnosis

Diagnosis is often initially made through microscopic examination of affected tissues. Gram staining of tissue or impression smears will reveal the clusters of small bacilli within lesions, although bacteria may be difficult to find. Culture is the definitive diagnostic method. FCN medium, a brain heart infusion medium with furazlidone, naladixic acid, and colimycin, which inhibit the growth of Gram-negative rods, is the medium of choice for the growth of *C. kutscheri*. There is no commercially available serology for *C. kutscheri*. PCR is another possible diagnostic method, but is not widely commercially available.

Interference with Research

Animals can harbor *C. kutscheri* with no ill effects, no apparent circulating antibodies, and no lesions. However, any disruption of the immune system can lead to an outbreak of disease, rendering animals clinically ill and unfit for use. Animals carrying *C. kutscheri* should not be used for research or testing purposes.

Prevention and Treatment

C. kutscheri is susceptible to most common disinfectants used in animal facilities. Any chemical or mechanical sterilant will also serve to remove *C. kutscheri* from the environment. *C. kutscheri* has been isolated from seawater, and can survive up to 8 days at 4°C in PBS. Environmental reservoirs or persistence of *C. kutscheri* are not described in the literature, however. Treatment of animals with antimicrobials may serve to treat illness, but would probably not resolve the carrier state, nor will antibiotic treatment eliminate bacteria from the bedding or cage surfaces. Thus, treatment

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is only recommended to ameliorate clinical signs if necessary for rederivation. Treatment of animals for *C. kutscheri* has not been reported. *C. bovis* isolates have been shown to be sensitive to tetracycline, enrofloxacin, and ampicillin and *C. kutscheri* isolates may have similar sensitivities.

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