**Klebsiella pneumoniae**

**Agent**
Gram-negative, non-motile, capsulated, facultative anaerobic, non spore-forming rod.
Family: Enterobacteriaceae

**Hosts**
Mice, rats, humans and all known mammalian species including but not limited to lagomorph species, canines, non-human primates, horses, bovines, raptors, guinea pigs, chinchillas, Australian mammals.

**Prevalence**
*Klebsiella* species are ubiquitous in nature and a common human and rodent intestinal tract commensal. Rodent colony prevalence may increase with antibiotic treatment, which presumably reduces the beneficial flora and allows *Klebsiella* overgrowth.
The incidence of *K.pneumoniae* infection is rare.

**Transmission**
Faecal-oral or from direct contact. *K.pneumoniae* may be spread to animals by humans.

**Clinical signs**
Immunocompetent animals do not usually display clinical signs. *K.pneumoniae* is an opportunistic organism and infection may occur when there is an overgrowth of bacteria due to disruption of the gut flora in immunocompromised rodents.
In rats, signs may include poor body condition, rough hair coat, abscesses, urogenital tract infections and sometimes mild rhinitis.
In mice, clinical signs include non-specific signs of dyspnoea, sneezing, cervical lymphadenopathy, inappetence, hunched posture and rough hair coat.

**Pathology**
In rats, cervical, inguinal and mesenteric lymph node abscesses, which may include the kidney.
In mice, *K.pneumoniae* were associated with bacteraemic disease with liver and kidney abscesses, empyema, pneumonia, leukocytic infiltration and thrombosis in the ventricular endocardium and myocardium.

**Diagnosis**
PCR and culture (faecal, oropharyngeal swabs, lesions). Diagnosis is based on agent isolation or detection in association with lesions that are not necessarily specific for *Klebsiella*. As *Klebsiella pneumoniae* can be recovered from clinically normal animals, isolation from the gastrointestinal tract, faeces, or in low numbers from mucosal surfaces is insufficient to demonstrate disease.

**Prevention and Control**
To prevent colonization of animals with *Klebsiella*, animals should be housed in strict bioexclusion housing as with immunodeficient animals. Treatment is not recommended and antimicrobials rarely resolve the carrier state nor eliminate bacteria from bedding or caging. Human *Klebsiella* isolates are usually multi-drug resistant. Gram-negative bacteria are generally susceptible to a number of disinfectants used in animal facilities. *Klebsiella* species can develop biofilms that may protect them unless first mechanically disrupted. To obtain animals without *Klebsiella*, rederive animals through embryo transfer or hysterectomy onto *Klebsiella*-free dams

**Research implications**
*Klebsiella* recovery as a component of the normal flora of a healthy laboratory rodent is of low significance. It is an opportunistic pathogen that may complicate studies in which host defences are compromised. It may lower plasma thyroxine levels in mice. *K.pneumoniae* has not been recognised as a primary pathogen.
References


Infectious diseases of mice and rats, National Research Council, 1991 pp.72-75


