

Susceptibility of *Sigmodon hispidus*

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SCIENTIFIC NAME

Sigmodon hispidus

TAXONOMY

PHYLUM: Chordata
CLASS: Mammalia
ORDER: Rodentia
FAMILY: Cricetidae

Physical description

Cotton rats are native to the southern US, Central America, Columbia and Venezuela. They thrive in dense grass cover and marshy fields, where they feed on grains, insects, small birds and eggs. Adult cotton rats weigh around 100–250 g and are stocky and robust in stature.

Reproduction and husbandry

Cotton rats in the wild are solitary in nature, which makes them very territorial and aggressive. In the wild, the males are generally more dominant than females, and the only time they come together is for mating. In a laboratory animal facility setting, often the females are aggressive towards the males, and care should be taken when females are introduced into a male's cage for breeding. Female cotton rats are spontaneous ovulators, and breeding is not seasonal. The gestation period is usually 27–28 d, and the average litter consists of five pups. Postpartum estrus occurs within 12 h of parturition¹. Pups are semiprecocious at birth, and weaning normally occurs by 3 weeks of age.

Cotton rats are highly excitable and can escape easily from an open cage. Personnel should remain calm and be careful when moving them from one cage to another. Owing to their aggressive nature, personnel should wear thick, protective gloves when handling cotton rats. Cotton rats often become acclimated to personnel who handle them routinely.



Research résumé

Cotton rats serve as excellent, alternative models for pathogens that do not infect conventional rat and mouse models¹. Wild cotton rats were used in polio research in 1937. After World War II, they were used in development of the typhus vaccine and in dental caries research. Cotton rats have been used to model many different respiratory infections and their associated immunogenicity^{2,3}. These include measles^{3,4}, adenovirus^{3,5}, respiratory syncytial virus^{3,6,7}, human influenza virus^{3,6,8}, metapneumovirus^{3,6}, human rhinovirus³, parainfluenza virus^{2,3}, tuberculosis⁹ and nasal colonization of *Staphylococcus aureus*^{8,10}.

Cotton rats have also been used in studies of herpes simplex virus, Venezuelan equine encephalitis and human immunodeficiency virus². In addition to bacterial and viral infections, cotton rats have been used to study fungi such as *Microsporum* and *Trichophyton* and parasites including *Brugia*, *Coccidia*, *Dipetalonema*, *Echinococcus*, *Fasciola*, *Leishmania* and *Litomosoides*².

Cotton rat cell lines and reagents, such as monoclonal antibodies and cytokines, are now available to facilitate studies of vaccine and antiviral therapies^{2,11}.

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