

## Intestinal Protozoa in Rodents

### Classification

Eukaryotic, one-celled intestinal parasites or commensals. Many are flagellated

### Family

Various

### Affected species

All rodents are susceptible to protozoal infection. Some possible infections are listed below by species, but this is not an exhaustive list. Intestinal (and hepatic) coccidial infections in rabbits are discussed in a separate technical information sheet. Wild-caught animals may have species of protozoa not described here. Some of these protozoa may be zoonotic. Generally, care should be taken with *Giardia* and *Cryptosporidium* spp. although *Giardia* usually has a limited host-range and transmission to humans from laboratory rodents has not been reported.

The starred species are considered pathogenic (although generally described as “mildly” or “marginally” so):

**Gerbils:** *Entamoeba* spp., *Giardia* spp.\*, *Tritrichomonas caviae*

**Guinea pigs:** *Balantidium caviae*, *Chilomastix* spp., *Cryptosporidium wrairi*\*, *Eimeria caviae*\*, *Giardia duodenalis*\*, *Monocercomonas* spp., *Tritrichomonas caviae*, and others.

**Hamsters:** *Cryptosporidium* spp.\*, *Giardia muris*\*, *Spironucleus muris*\*, numerous others of little significance

**Mice:** *Chilomastix bettencourti*, *Cryptosporidium muris*\*, *Cryptosporidium parvum*\*, *Eimeria* spp.\*, *Entamoeba muris*, *Giardia muris*\*, *Hexamastix muris*, *Spironucleus muris*\*, *Trichomonas muris*, *Tritrichomonas muris*, and others

**Rats:** *Chilomastix bettencourti*, *Cryptosporidium muris*\*, *Cryptosporidium parvum*\*, *Eimeria* spp.\*, *Entamoeba muris*,

*Giardia simoni*\*, *Hexamastix muris*, *Monocercomonoides* sp., *Retortamonas* sp., *Spironucleus muris*\*, *Trichomonas muris*, *Tritrichomonas muris*, and others

### Frequency

Rates of protozoal infection vary between individual colonies. Most of the generally pathogenic parasites have been eradicated from modern laboratory mouse, rat, and guinea pig colonies, but may be present in hamster and gerbil colonies. Protozoal infection rates among wild and pet animals are high.

### Transmission

Intestinal protozoa are transmitted via contact with infective cysts. This is normally via the fecal-oral route.

### Clinical Signs and Lesions

Generally, there are no clinical signs associated with protozoal infection. In immunocompromised animals, or young animals with heavy infestations, non-specific signs such as weight loss, runting, hunched posture, or rough hair coat may be seen. Animals may have signs related to the gastrointestinal tract, such as diarrhea.

On microscopic examination, protozoa may be seen in the stomach, intestinal crypts, or free in the lumen of the gastrointestinal tract. Since infection with commensal protozoa with no sequelae is a common finding, other causes for the non-specific signs mentioned above must be ruled out before a diagnosis of protozoal enteropathy is made.

### Diagnosis

Protozoa are generally diagnosed through examination of feces or direct smears of intestinal contents. Some protozoa are present in portions of the gastrointestinal tract best evaluated by histopathology. More detailed information on protozoa, including line drawings and photographs may be found in *Flynn's Parasites of Laboratory Animals*, edited by D. G. Baker.

### Interference with Research

Infection with intestinal protozoa is generally of little

# technical sheet

concern, since most pathogenic species have been eliminated from modern laboratory colonies. However, a new infection may be a marker of problems with biosecurity. Animals showing clinical signs are not suitable for use in research, as the disruption of the intestinal tract will have consequences for most research aims. If animals are to be used in protozoal research, as a model of human protozoal infections for example, they should be free of all protozoa. Most research on gastrointestinal physiology or gastrointestinal disease requires animals free of protozoal infection, as well.

## Prevention and Treatment

Animals should be screened regularly for protozoa and incoming animals quarantined. Facilities may have a list of protozoa they will accept into their facility in order to minimize the necessity for rederivation for infection with a particular agent. Protozoal infections of any sort are generally not tolerated in immunodeficient animals. Wild animals (vertebrate and invertebrate) should be prevented from entering the animal facility, as these may serve as a reservoir of infection or transmit infective feces via direct contact.

The infective forms of protozoal parasites have varying survival times outside the host and varying susceptibilities to disinfectants. Generally, a thorough cleaning and elimination of all fecal matter in the environment is recommended. As a follow-up, chlorine-based disinfectants or sterilants are often used. Autoclaving will serve to kill infectious forms as well. Treatment of some protozoal infections is possible (for example, metronidazole for *Giardia* infections) but is not recommended. Treatment will not remove all organisms from an animal, nor will it remove infectious forms from the bedding or cage surfaces. Thus, treatment is only recommended to ameliorate clinical signs or to decrease parasite load before rederivation. Hysterectomy or embryo transfer rederivation is effective in eliminating intestinal protozoa infections.

## References

Baker DG, editor. *Flynn's Parasites of Laboratory Animals*. Ames: Blackwell; 2007. 813 pp.

Fox JG, Anderson LC, Lowe FM, Quimby FW, editors. *Laboratory Animal Medicine*. 2nd ed. San Diego: Academic Press; 2002. 1325 pp.

Percy DH, Barthold SW. *Pathology of Laboratory Rodents and Rabbits*. Ames: Iowa State University Press; 2007. 325 pp.