
實驗動物技術及動物福祉 (2)

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主席

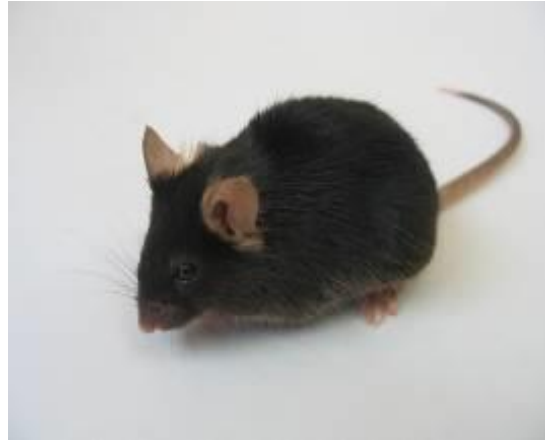
演講主題

2.常見之異常症狀及處理



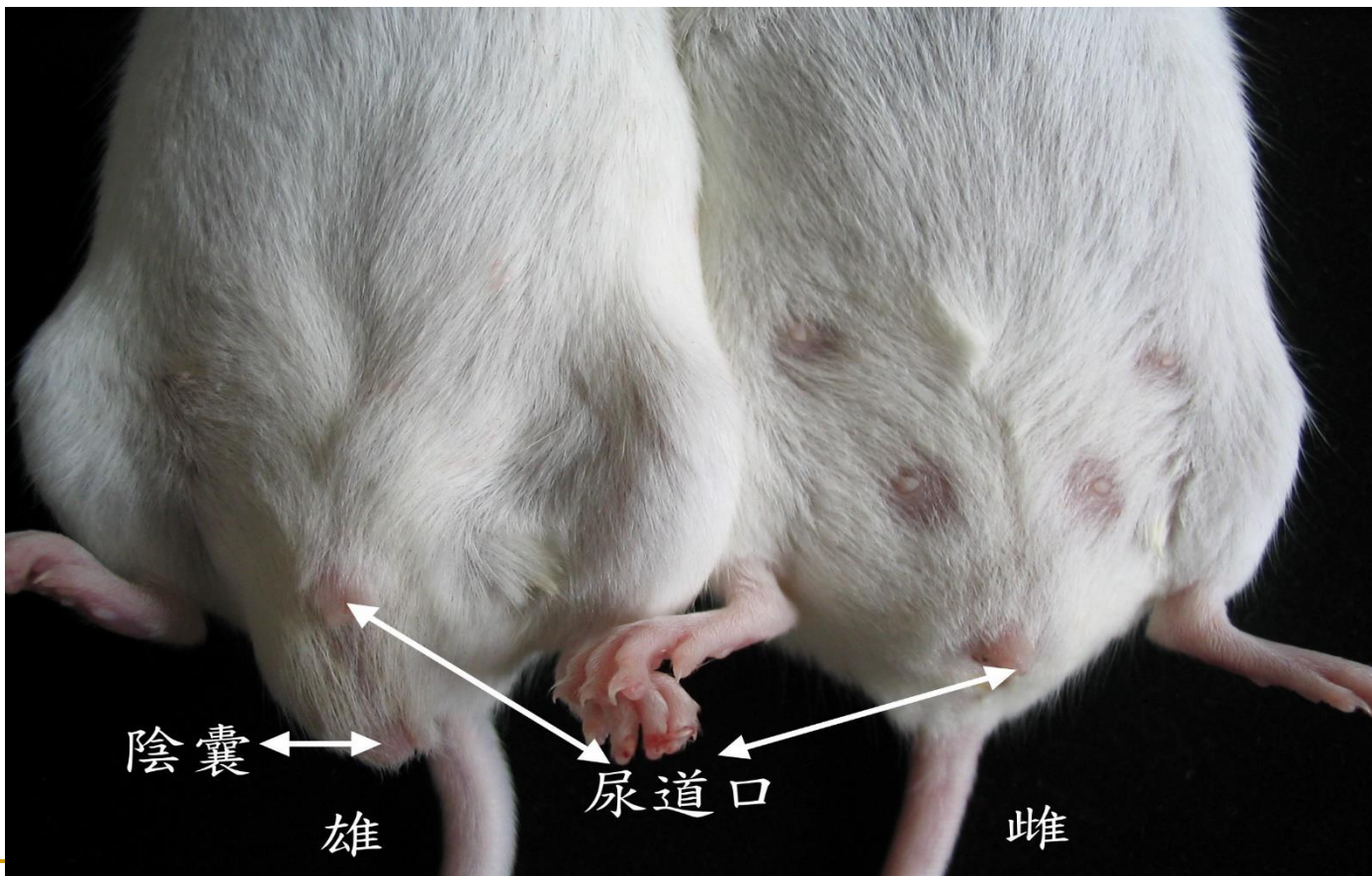
嚙齒目動物的特徵

- 使用抗生素易造成腸內菌死亡
- 除少數的松鼠科動物外都屬於夜行性 (nocturnal) 動物
- 視覺極端退化，其他感覺器官相對非常敏感，包括敏銳的聽覺與嗅覺，及探觸環境的觸鬚
- 費洛蒙效應
- 母鼠在交配後有陰道栓塞 (vaginal plug) 可為配種依據

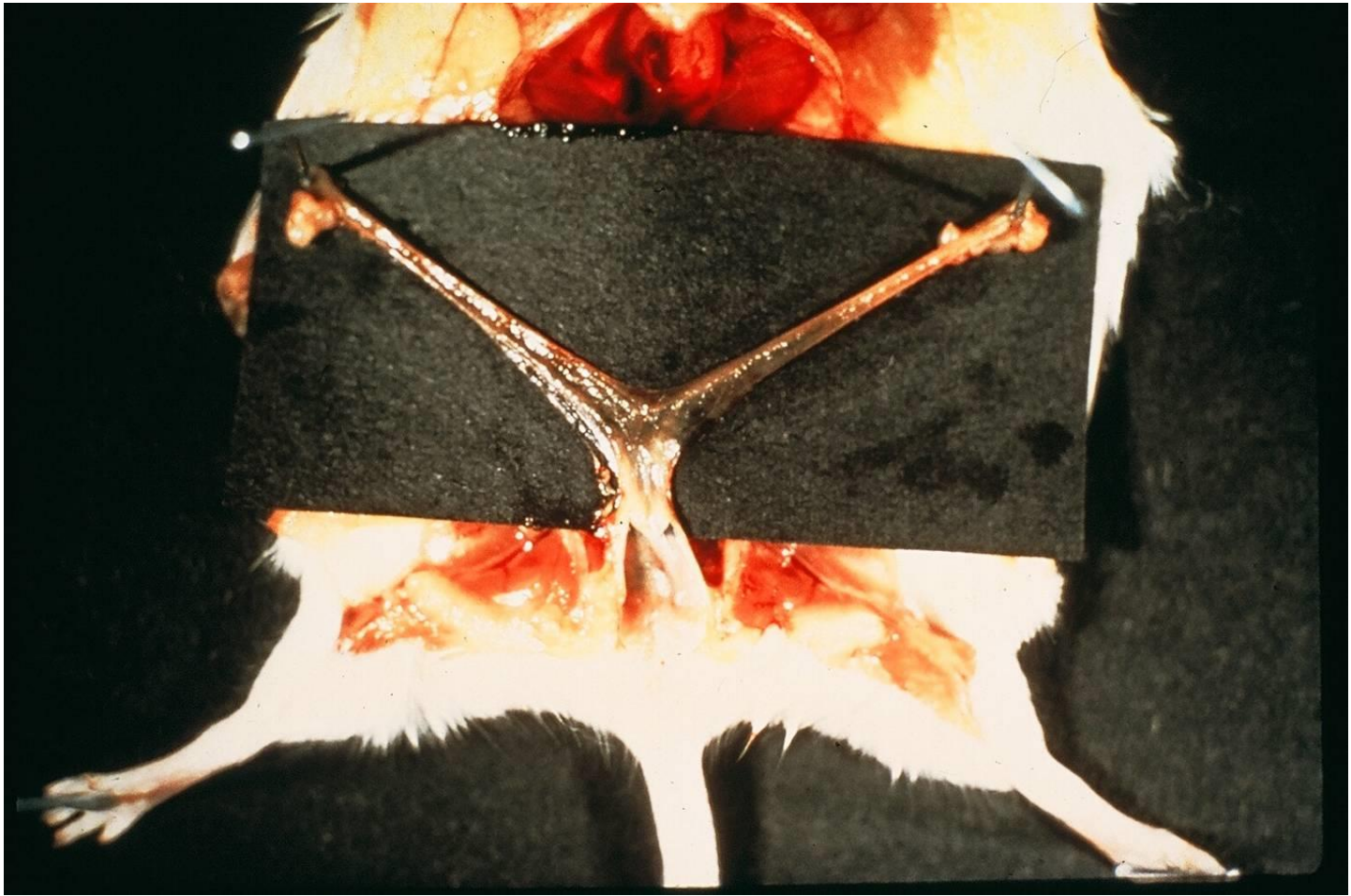


Daily observation of rat colony





Uterus



Animal models for some human diseases - Mouse

- Hypertension
 - Arthritis
 - Hodgkins disease
 - Hemolytic anemia
 - Hydrocephalus
 - Coronary arteriosclerosis
 - Obesity
 - Adrenal insufficiency
 - Muscular dystrophy
 - cataracts
-

大鼠(RATS)

- 較小鼠溫馴，並不具侵略性
- 無膽囊、扁桃腺，胰臟為散佈型
- 門牙不斷生長
- 盲腸發達，可消化吸收纖維素
- 棕色脂肪如同小鼠
- red-brown gland比眼球大，會分泌紅色液體
- 繁殖時不築巢
- 尾皮易剝離

Animal models for some human diseases - Rat

- Hypertension
 - Viral hepatitis
 - Cataract
 - Cystic kidney
 - Diabetes mellitus
 - Hepatic megalocytosis
 - Hydronephrosis
 - Hyperlipemia
-

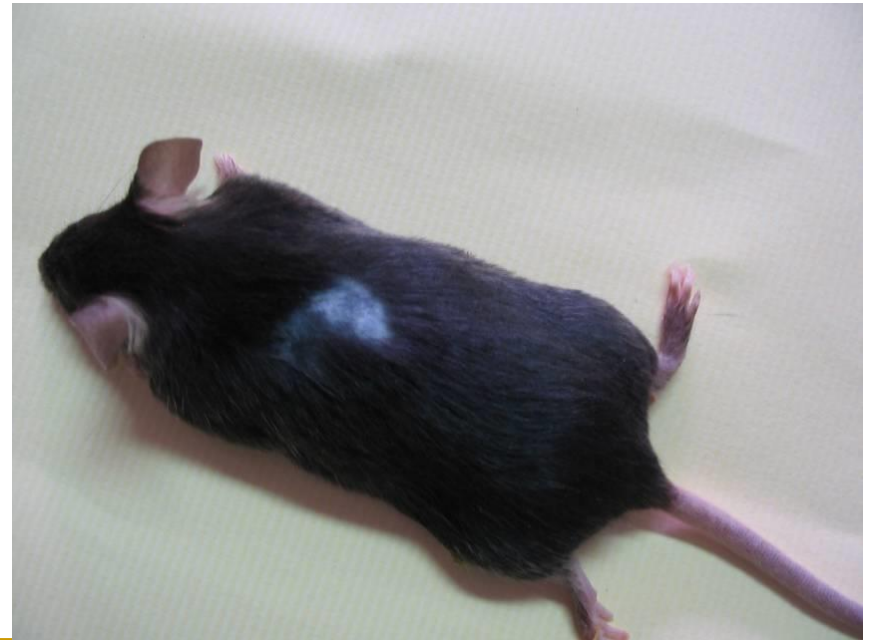
大、小鼠常見疾病

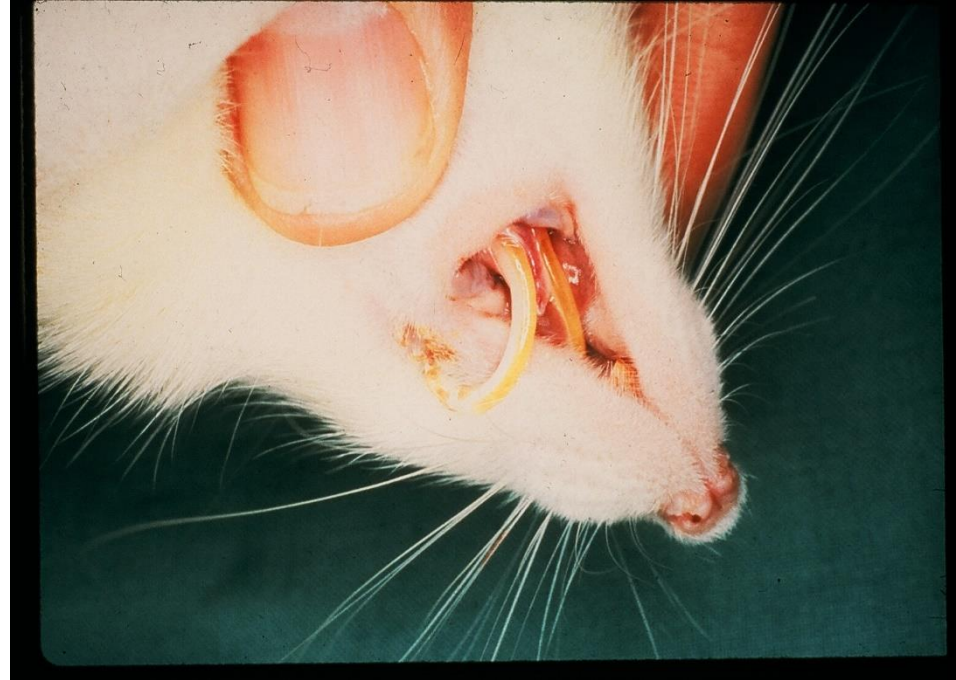
SICK MOUSE AND RAT SYNDROM

Signs of Disease-1

- Alopecia (Hair loss) –skin disease, fighting, or barbering
 - Anemia- associated with excess internal or external blood loss
 - Anorexia – not eating, not drinking
 - Bleeding- can be externally from a torn nail or cut on the mouth or shin or from an internal organ such as the urinary bladder or uterus
-

Fighting





Signs of Disease-2

- Circling or head tilt – indicates an infection of middle or internal ear
 - Constipation – can be caused by a lack of feed or water, serious infections, and other disease problems.
 - Coughing – indicate a problem in the throat or lung
-

Signs of Disease-3

- Diarrhea – infections or parasites of the intestinal tract,
 - Discharge – infection involving internal organs.
 - Dyspnea – common sign of pneumonia.
 - Lethargy
 - Listlessness – in pain or tired.
 - Loss of weights – associated with parasites or a severely debilitating disease
-

Signs of Disease-4

- Paralysis- nerve damage or a disease affecting the central nervous system
 - Prolapsed – due to straining during defecation or parturition
 - Pruritus – an irritation of skin because of external parasites
-

Signs of Disease-5

- Rough hair coat – a vitamin deficiencies, ectoparasitism, endoparasitism, and severe infection.
 - Sneezing – a sign of nasal irritation
 - Stunted – can be due genetic composition, infections, parasites, or poor husbandry
 - Tumor- abscess caused by bacteria or cancerous tumor.
-

SICK MOUSE(RAT) SYNDROM

-Tell You Little (If Anything) Except

You have a sick animal, and, therefore, you have a problem

- Infectious Disease
 - Metabolic Disease
 - Nutritional Disease
 - Environmental Problem
 - Others : experimental procedure, routine husbandry
-

SICK MOUSE(RAT) SYNDROM

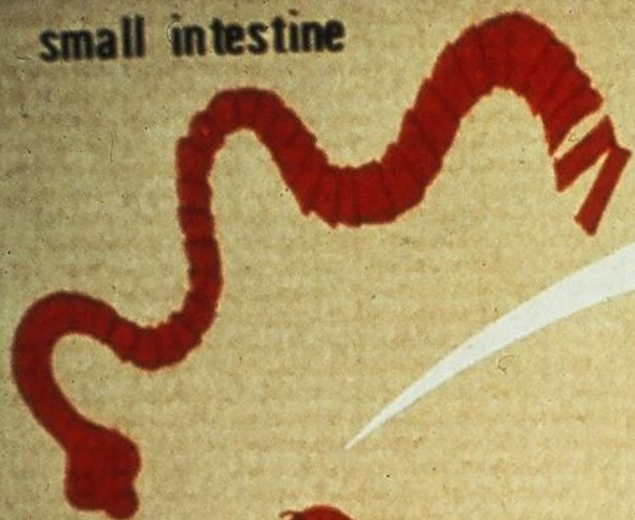
You probably need to do a diagnostic working

- Pathology
 - Serology
 - Bacteriology
 - Parasitology
 - Feed analysis
 - Evaluate environment and records
-

Common diseases of lab. Mice and Rats - Endoparasitic Diseases

- Tapworm
 - Hymenolepis diminuta
 - Hymenolepis nana
 - Cysticercus fasciolaris
- Pin worm
 - Syphacia obvelata
 - Aspicularis tetraptera

Adult in
small intestine



Gravid Proglottids
disintegrate

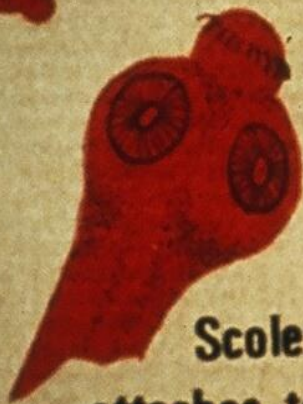


Life Cycle of
Hymenolepis nana



Egg in feces

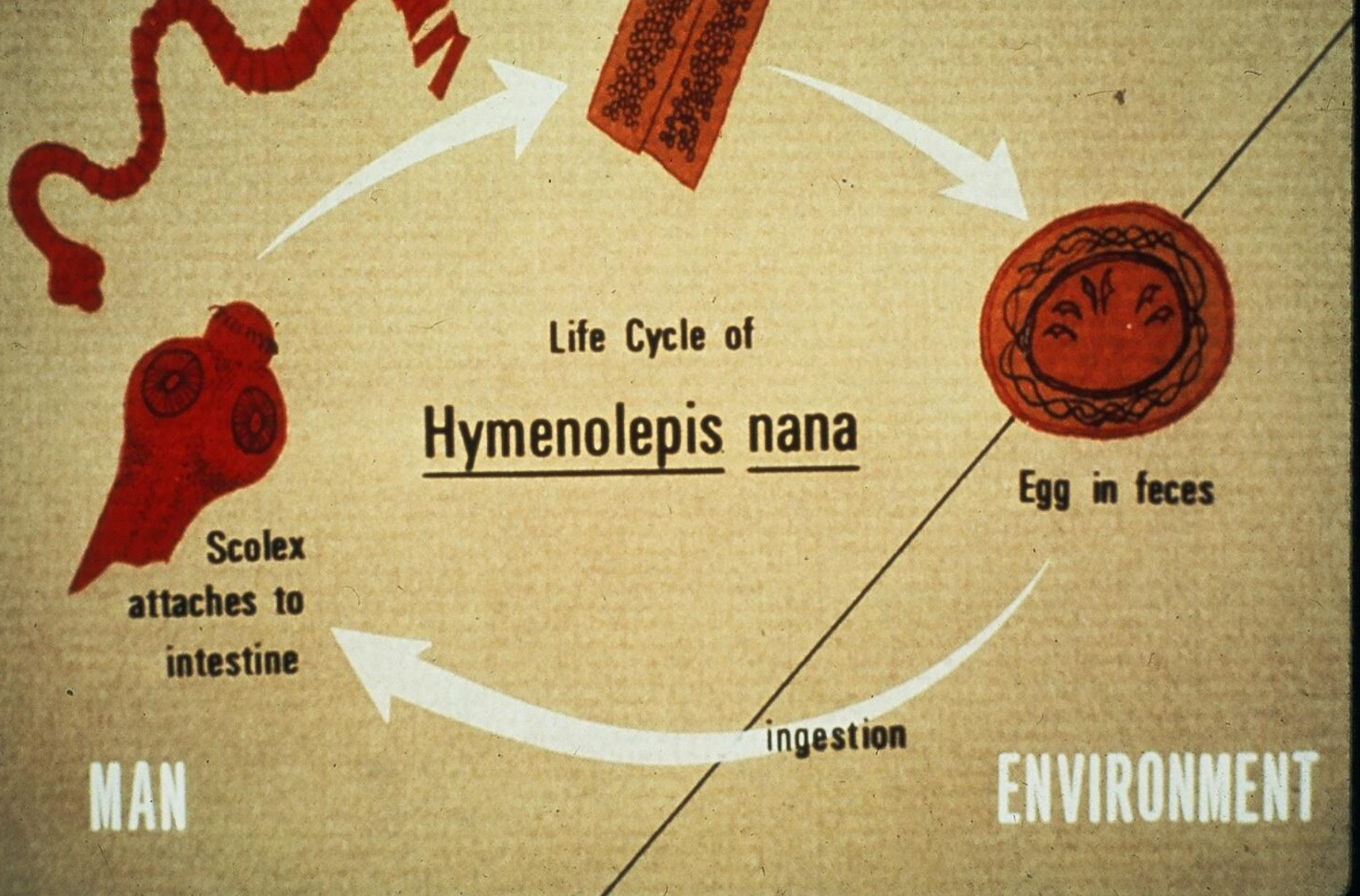
Scolex
attaches to
intestine

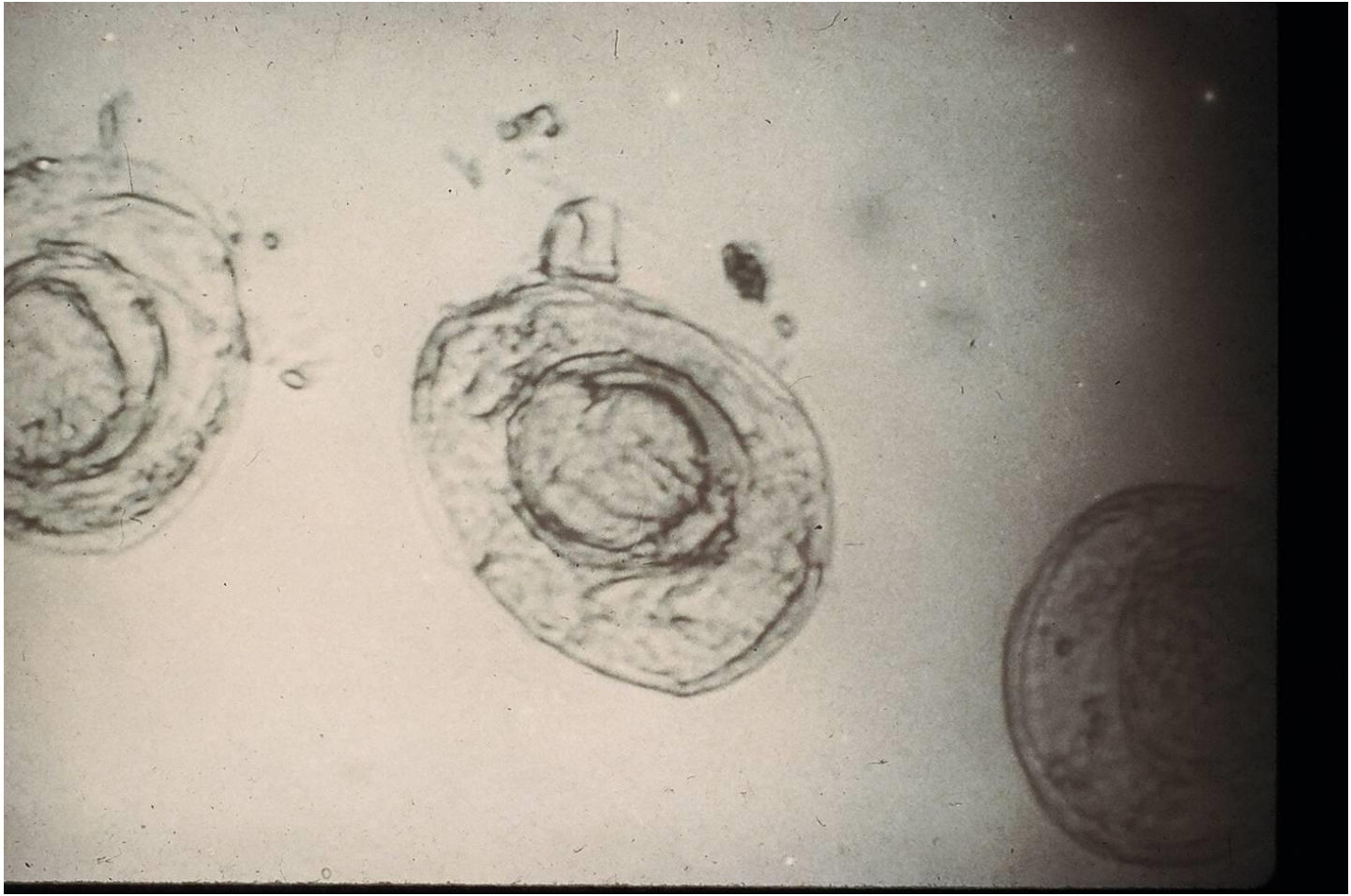


MAN

ingestion

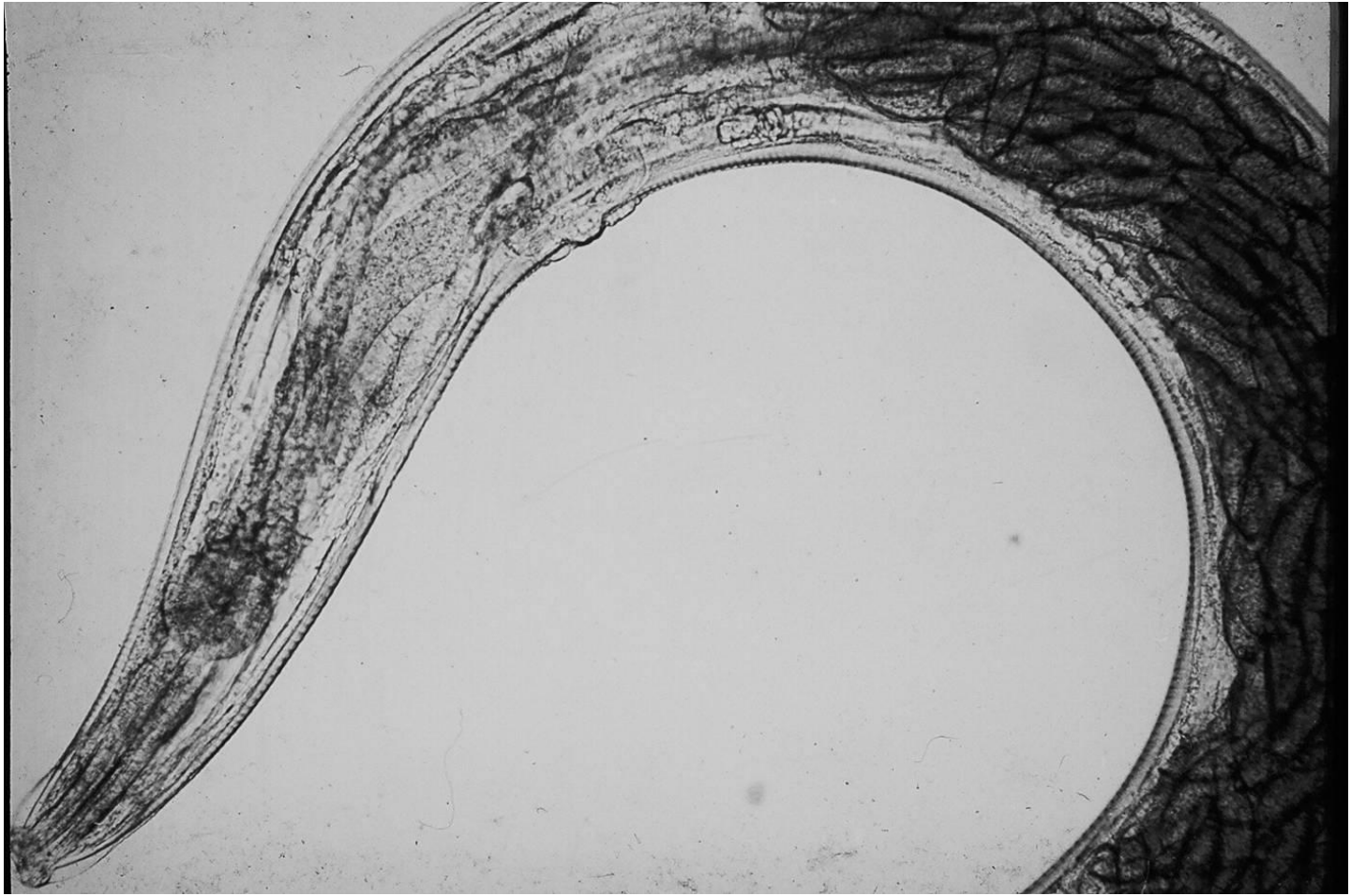
ENVIRONMENT







Female Pin worm



Pin worm eggs



Common Ectoparasites of lab. Mice and Rats

Lice	<u>Polyplax</u> <u>serrata</u>
Mites	<u>Myobia</u> <u>musculi</u> <u>Myocoptes</u> <u>musculinus</u>
Fleas	<u>Leptosylla</u> <u>segnis</u> <u>et</u> <u>al</u>

Lice



Lice

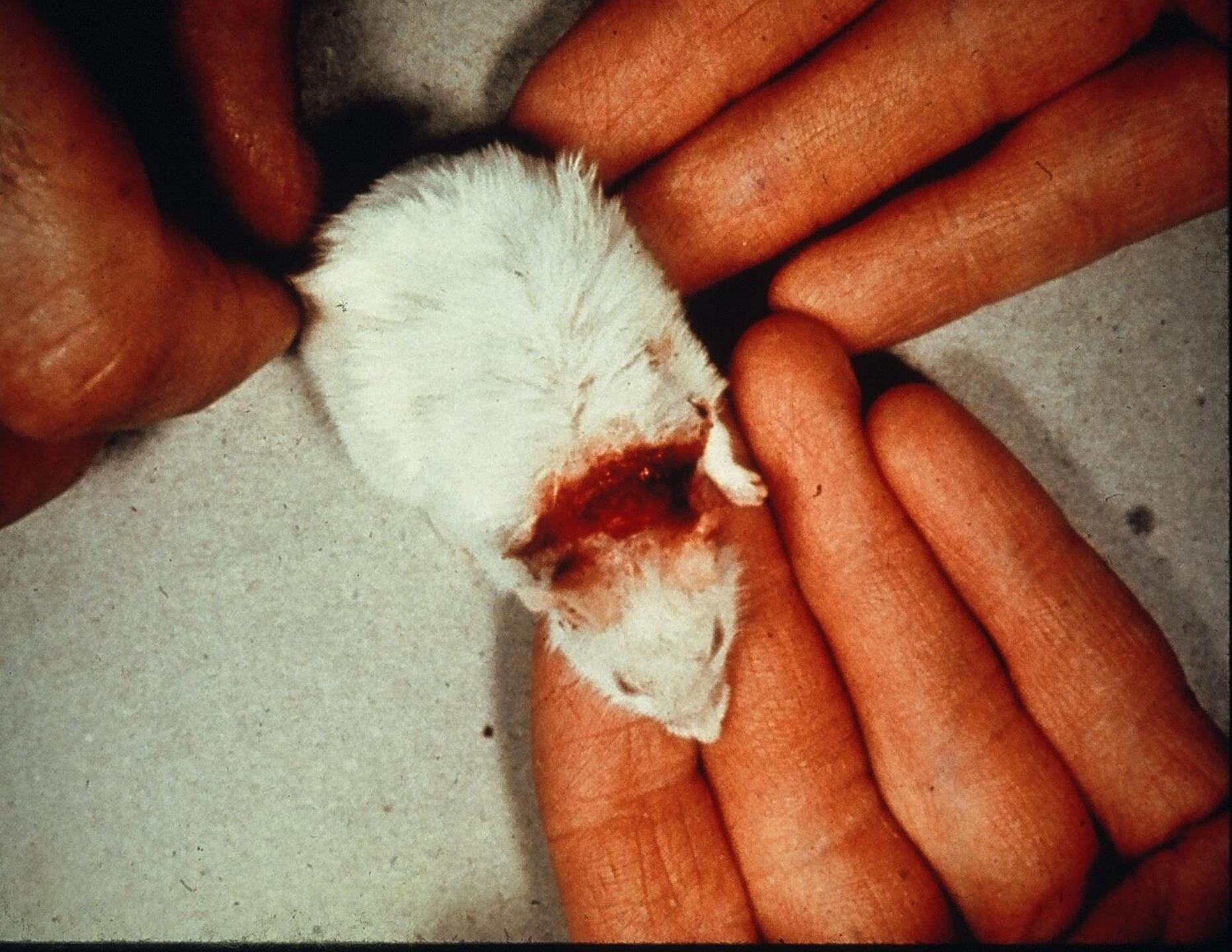


Mite









Common diseases of lab. Mice (1)

Viral diseases

- 1. Ectromelia (mouse pox)
 - 2. Sendai virus
 - 3. Infantile diarrhea (EDIM)
 - 4. Lymphocytic Choriomeningitis
 - 5. Mouse hepatitis virus (MHV)
 - 6. MPV, K-virus, Pneumonia virus of mice(PVM), LDH virus, Reo-3 virus, rotavirus, etc.,
-

Influence of Genotyping on Mortality in Epizootic of Mouse Pox

Inbred Strain	Mortality
DBA/1	84%
A	84%
C3H	71%
C57BL/6	<1%
BALB/c	<15%
AKR	<1%

Sendai Virus

- A large RNA virus
 - Highly infectious
 - Unstable in the environment
 - Cause an acute respiratory infection
 - Transmitted with contact and exhaust air sentinels , but not to soiled bedding sentinels
-

Mouse Hepatitis Virus (MHV)

- A large RNA virus
 - Highly infectious
 - Unstable in the environment
 - Cause an acute intestinal infection
-

Mouse parvovirus (MPV)

- A small DNA virus
 - Moderately infectious
 - Highly stable in the environment
 - Cause a persistent systemic infection with viral shedding in the urine, feces and expired air
-

Murine rotavirus

- A medium size double stranded RNA virus,
 - Highly infectious
 - Highly stable in environment
 - Cause an acute intestinal infection
 - Transmitted only to contact sentinel
-

Common diseases of lab. Mice (2)

Bacterial diseases:

- 1. Bacterial and Mycoplasmal pneumonia
 - 2. *Salmonella spp.* Infection
 - 3. Murine colonic hyperplasia :
Citrobacter freundii
 - 4. *Pseudomonas spp.* Infection
 - 5. Tyzzer's disease: *Clostridium piliforme*
 - 6. Helicobacter
 - 7. Misc. bacterial diseases :
Strep., Staphy., Corynebacterium
-

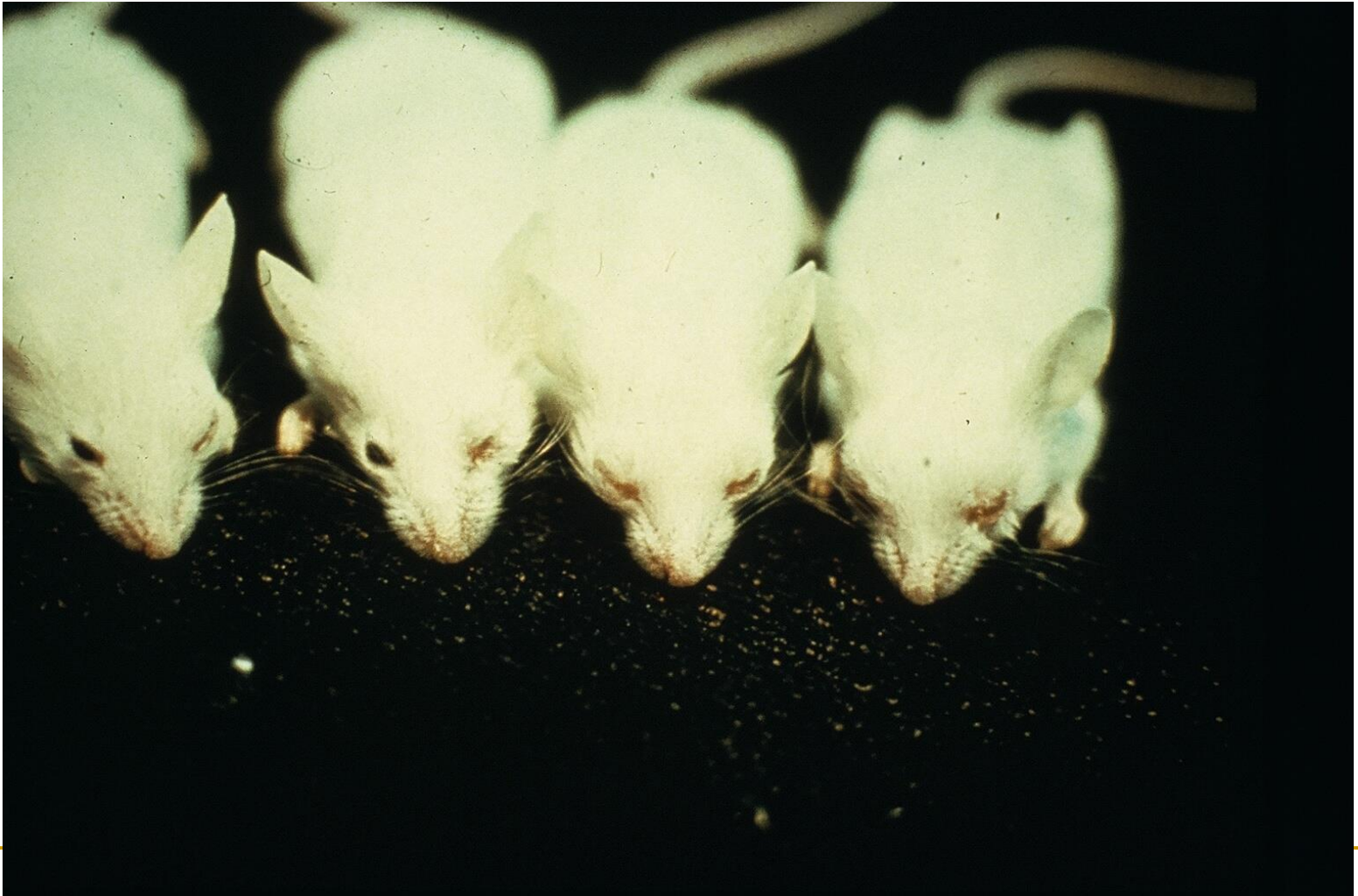
Gram Positive Cocci Infection



Enteric Gram Negatives Bacteria



Small Gram Negative Bacilli







Green Fur caused by *Pseudomonas aeruginosa*

Significance

**Morbidity and Mortality
Complication of Animal
Experimentation**

Murine Respiratory Mycoplasmosis

- MRM Stands out as the major complicating factor in the use of rats in biomedical research
 - Syndrome including : chronic murine pneumonia, enzootic bronchiectasis, infectious catarrh, endemic murine pneumonia, viral pneumonia, labyrinthitis ...etc..
-

Common diseases of lab.

Rats (2)

Viral diseases:

- 1. Sialodacryoadenitis (SDAV)
 - 2. Cytomegalovirus
 - 3. Rat parvovirus
 - 4. Sendai virus
-

Common diseases of lab. Rats (3)

Misc. conditions of non-infectious diseases

1. Ringtail
 2. Chromodacryorrhea
 3. Disease of aging: chronic renal disease, spinal nerve root degeneration, skeletal muscle degeneration, polyarteritis nodosa
 4. Neoplasms
-

Diarrhea of soft stools (Mice)

- MHV
 - EDIM
 - *Citrobacter freundii*
 - Endoparasite
 - *Salmonella spp.*
 - *Clostridium piliforme*
 - A typical *E. coli*
 - *Streptobacillus moniliformis*
-

Emaciation / Weight Loss (Rat)

- Endoparasites
 - *Salmonella spp*
 - *Clostridium piliforme*
 - *Mycoplasma pulmonis*
 - *Car bacillus*
 - *Citrobacter kutscheri*
 - Parvovirus
-

Ocular Discharge / Conjunctives (Rat)

- SDAV
 - *Mycoplasma pulmonis*
 - *Mycoplasma arithritis*
 - *Corynebacterium kutscheri*
 - *Streptococcus pneumoniae*
 - *Salmonella spp.*
 - *Pneumonia pneumotropica*
-

Chronic Respiratory Disease (Rat)

- *Mycoplasma pulmonis*
 - *Streptococcus pneumoniae*
 - Sendai Virus
 - *Pasteurella pneumotropica*
 - *Corynebacterium kutscheri*
-

AGENTS WHICH MAY INTERFERE WITH RESEARCH

AGENTS WHICH MAY INTERFERE WITH CARCINOGENESIS STUDIES IN MICES

- ◆ *MHV*
 - ◆ *Sendai Virus*
 - ◆ *Mouse polyoma V.*
 - ◆ *MVM*
 - ◆ *Citrobacter freundii*
 - ◆ *M. pulmonis*
 - ◆ *Klebsilla*
 - ◆ *C. kutscheri*
 - ◆ *C. piliforme*
-

AGENTS WHICH MAY INTERFERE WITH PHARMACOLOGICAL STUDIES IN MICE

- EDIM
 - *Salmonella spp.*
 - *Clostridium piliforme*
-

AGENTS WHICH MAY INTERFERE WITH TUMOR TRANPLANTATION/HYBRIDOMA STUDIES IN MICE

- ◆ **MHV**
 - ◆ **REO-3**
 - ◆ **Ectromelia**
 - ◆ **LCM**
 - ◆ **Sendai Virus**
 - ◆ **Mouse thymic
necrosis virus**
 - ◆ **K Virus**
 - ◆ **MVM**
 - ◆ ***M. pulmonis***
 - ◆ ***C. kutscheri***
 - ◆ ***C. piliforme***
-

AGENTS WHICH MAY INTERFERE WITH TOXICOLOGICAL STUDIES IN MICE

- ◆ MHV
 - ◆ EDIM
 - ◆ *M. pulmonis*
 - ◆ *Klebsiella spp.*
 - ◆ *Corynebacterium kutscheri*
 - ◆ *Clostridium piliforme*
 - ◆ *Pasteurella spp.*
-

AGENTS WHICH MAY INTERFERE WITH CARCINOGENESIS STUDIES IN RATS

- *Mycoplasma pulmonis*
 - *Corynebacterium kutscheri*
 - *Clostridium piliforme*
 - KRV/H-1
-

AGENTS WHICH MAY INTERFERE WITH PARMACOLOGICAL STUDIES IN RATS

- *Sterptococcus pneumoniae*
 - *Salmonella spp.*
 - *Clostridium piliforme*
-

AGENTS WHICH MAY INTERFERE WITH TOXICOLOGICAL STUDIES IN RATS

- ◆ *Mycoplasma pulmonis*
 - ◆ *Corynebacterium kutscheri*
 - ◆ *Streptococcus pneumoniae*
 - ◆ *Clostridium piliforme*
 - ◆ KRV/H-1.
-

AGENTS WHICH MAY INTERFERE WITH TUMOR TRANPLANTATION/HYBRIDOMA STUDIES IN RATS

- ◆ *M. pulmonis*
 - ◆ *M. arthritidis*
 - ◆ *C. kutscheri*
 - ◆ *C. piliforme*
 - ◆ KRV/H-1
-

AGENTS WHICH MAY INTERFERE WITH INFECTIOUS DISEASE STUDIES IN MICE

- ◆ MHV
- ◆ EDIM
- ◆ GD-VII
- ◆ K Virus
- ◆ Mouse polyoma V.
- ◆ *C. kutscheri*
- ◆ *Clostridium piliforme*
- ◆ *Strptob. moniliformis*
- ◆ *M. pulmonis*
- ◆ *CAR bacillus*
- ◆ *Pasteurella spp.*

AGENTS WHICH MAY INTERFERE WITH INFECTIOUS DISEASE STUDIES IN RATS

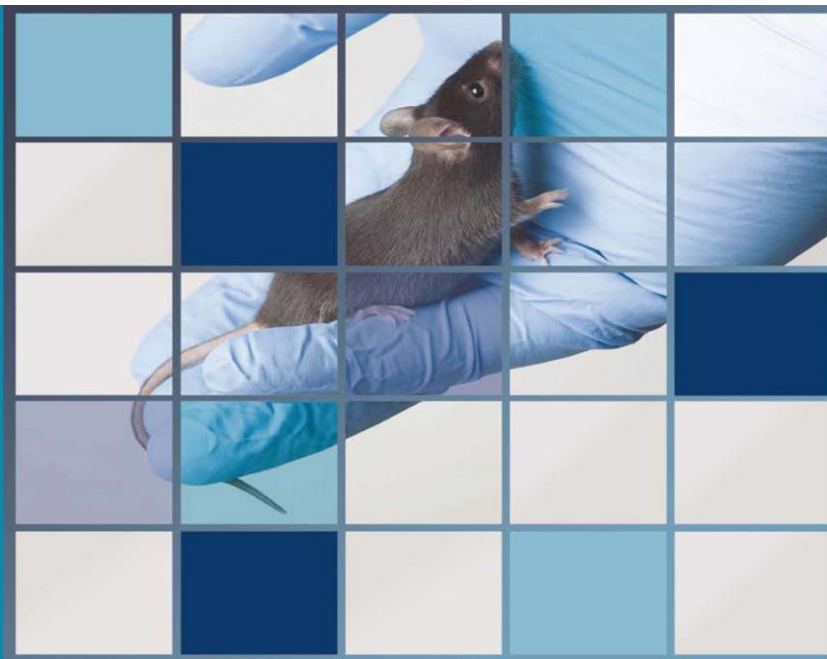
- ◆ *Corynebacterium kutscheri*
 - ◆ *Clostridium piliforme*
 - ◆ KRV/H-1
 - ◆ *Mycoplasma pulmonis*
 - ◆ *Mycoplasma arthritidis*
 - ◆ CAR Bacillus
 - ◆ *Streptococcus pneumoniae*
 - ◆ *Salmonella spp.*
 - ◆ *Pasteurella spp.*
-

AGENTS WHICH MAY INTERFERE WITH PHYSIOLOGICAL STUDIES IN MICE

- **MHV**
 - **ECTROMELIA**
 - ***C. KUTSCHERI***
-

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