The Laboratory Guinea Pig

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Disclaimer

• Not ACLAM-sanctioned
• No specific knowledge of material on the 2009 ACLAM exam

• Name two inbred strains of guinea pigs:

  Order:  
  Suborder:  
  Family:  
  Genus/Species:  

Two outbred stocks: Dunkin-Hartley & Hartley
Guinea pigs have precocious offspring.

Name other laboratory animal species with precocious offspring:

True/False: The hairless guinea pig is euthymic.

Have been used as a model for studying chemical warfare vesicants such as mustard gas.
Crl: IAF (HA) BR
When does the *vaginal closure membrane* open in guinea pigs?

What is the name of the toxin found in guinea pig seminal fluid?

Guinea pig scurvy. Note hemorrhage at costochondral junction.

Guinea pigs cannot convert glucose to ascorbic acid due to a lack of what enzyme?
Guinea pig scurvy

Bronchopneumonia in a guinea pig.

Suppurative bronchopneumonia. Likely etiologic agent?

What's your diagnosis?

Differential etiologic diagnoses?

What's your diagnosis?

List some additional species which are susceptible to this (or a similar) problem.
Slide 1 of 3: Diarrhea in guinea pigs. What are some differential diagnoses?

Slide 2 of 3: Gas-filled intestine.

Slide 3 of 3: Diarrhea in guinea pigs. What are some differential diagnoses?

Slide 2 of 3: Gas-filled intestine.

Diagnosis (genus and species):

Direct life cycle; complete in 65 days
No migration beyond the intestinal mucosa
Infections usually asymptomatic

Acid-fast Cryptosporidiosis

Ascarid ovum

Gross slide from a guinea pig.
Trichophyton mentagrophytes. Spores can be demonstrated in hair follicles on H&E. PAS or silver staining may aid visualizing the fungi.

Focal alopecia and pruritus in a guinea pig.

What's your diagnosis? Etiologic agent?

Gross image from the hairs of a guinea pig.

What's your diagnosis? Genus & species.

Genus & species?
Genus & species?

Cervical lymphadenitis in a guinea pig. Most likely etiology?
What else is wrong in this picture?

Streptococcus zooepidemicus OR Streptococcus equi ssp. zooepidemicus (depends on the reference)

Lancefield Group C
Beta-hemolytic
Blood smear from a guinea pig. What is it ??!!!

KURLOFF CELL
(A.K.A “Foas-Kurloff cells”)
- Unique mononuclear cells found in certain tissues of guinea pigs
- In nonpregnant animals, located in:
  - Splenic sinusoids (can be identified on splenic impression smears)
  - Stromal tissues of bone marrow and thymus
- In pregnant animals, increase with pregnancy & in response to estrogen
- PAS positive, mucopolysaccharide
- Considered to be the counterpart of NK cells in other species; NK cytotoxic activity

Histo slide from a guinea pig.
Morphologic diagnosis?
Differential diagnoses?

Encephalitozoon cuniculi in a guinea pig

Animals in a shipment of 2-month-old Hartley guinea pigs were depressed, anorexic, with pasty stools.

Etiologic diagnosis?
Identify the name of the test used to identify Listeria monocytogenes by instilling a culture of the bacterium into the conjunctival sac of guinea pigs or rabbits. The culture will produce severe keratoconjunctivitis sicca (KCS) within 24 hours.

A. Sereny test
B. Anton test
C. Cobaye test
D. Quelling test
E. Draize test

Histopath: Note large oval basophilic intranuclear inclusions. Etiologic diagnosis?

Adenoviral pneumonia or pneumonitis in a guinea pig.

No serologic tests available.

“Adenoviral infections in colonies of guinea pigs are probably more relevant than currently recognized.”

Percy & Barthold 2007

A recently-published paper describing a guinea pig model of transfusional iron overload confirmed that iron overload does NOT cause which of the following effects:

a. Arrhythmias
b. Darkly-pigmented skin
c. Hepatomegaly
d. Increased cardiac and hepatic iron concentrations


Per a recent publication, the preferred injectable anesthetic regimen in guinea pigs for blood collection from the anterior vena cava is:

a. Medetomidine 0.5 mg/kg IM
b. Ketamine-Xylazine 30 & 2.5 mg/kg SC
c. Ketamine-Xylazine 30 & 2.5 mg/kg IM
d. Ketamine-Xylazine 30 & 2.5 mg/kg IP
e. Pentobarbital 37 mg/kg IP

Guinea pigs are a suitable model for tuberculosis research because of which of the following characteristics:

a. Extreme susceptibility to TB infection
b. Symptoms and pathology similar to human TB infection
c. Delayed-Type Hypersensitivity (DTH) response
d. Demonstrated protection from infection when admin. BCG
e. All of the above