Review of 2009 Comparative Medicine

Douglas K Taylor, DVM, DACLAM
C.L. Davis @ NC State

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Doug's Quick Tips

- Read *everything* and take notes
  - *Least* emphasis on novel/specific results
  - Subsequently study only your notes
- Focus on facts that you can actually remember
  - ~600 pages in 2009 Comp Med-you gotta cut bait at some point
- Try to lump papers by topic
- Try to formulate a 'few' reasonable questions from any given paper
  - Bear in mind that the exam questions must be backed by 2 references
- Think about papers in 2 ways:
  - Is there data from the paper that might serve as a question?
  - Does the paper serve to prompt a question about older, classic core material?

Disclaimer

- **This is not an ACLAM sanctioned presentation**
- **All information is deemed reliable and correct**
  - No warranty for accuracy
- **No information presented is known to be specifically included in the ACLAM Board Certification Exam**

Disclaimer

Dr Taylor is of reasonable intellect. He, like you, however, has absolutely no idea what questions might actually appear on the 2010ACLAM Certifying Examination. This presentation represents his best attempt to highlight material that might serve as the basis for questions and in no way, shape, or form is it sanctioned by ACLAM. Any resemblance between questions asked herein and those on the actual examination is purely coincidental, but nevertheless fortunate for those in attendance today. Amen.

Volume 59 (1)
February, 2009

Effects of *Helicobacter* Infection on Research: The Case for Eradication of *Helicobacter* from Rodent Research Colonies

Maciej Chichlowski and Laura P Hale*

Table 1. Rodent host species and sites of *Helicobacter* infection.

Helicobacter spp.	Infected species[a]	Site of infection	References
H. aurati	Hamster	Stomach, intestine	82, 83
H. bilis	Mouse, rat	Intestine	35
H. cholecystus	Hamster	Gallbladder	36
H. cinaedi	Hamster	Intestine	108
H. ganmani	Mouse, rat	Intestine	89
H. hepaticus	Mouse, rat, gerbil	Intestine	25, 44, 97
H. mesocricetorum	Hamster	Intestine	104
H. mastomyrinus	*Mastomys natalensis*	Liver	101
H. muridarium	Mouse, rat	Intestine, stomach	54
H. pylori (experimental infections only)	Mouse	Stomach	93
H. rodentium	Mouse, rat	Intestine	100
H. trogontum	Rat, mouse	Intestine	73, 75
H. typhlonius	Mouse, rat	Intestine	39

[a]Unless noted, all mice listed are *Mus musculus*.

Table 2. Rodent models of *Helicobacter*-associated gastrointestinal and liver cancer

Mouse strain	*Helicobacter* spp. involved	Tumor	References
INS-GAS	*H. pylori*, *H. felis*	Gastric adenocarcinoma	50,55
BALB/c-IL10$^{-/-}$	*H. hepaticus*	Colon carcinoma	79
IL10$^{-/-}$ (C57BL/6)	*H. typhlonius*, *H. rodentium*, *H. hepaticus*	Colon carcinoma	9,46,53
Mdr1a$^{-/-}$	*H. hepaticus*, *H. bilis*	Colon carcinoma	60,111
Rag2$^{-/-}$	*H. hepaticus*	Colon carcinoma	15
A/JCr	*H. hepaticus*	Hepatocellular carcinoma	92,110
Smad3	*H. hepaticus*, *H. bilis*	Colon carcinoma	62

- Which of the following *Helicobacter* species are **urease positive**?
  1. *H. hepaticus*
  2. *H. bilis*
  3. *H. pylori*
  4. *H. muridarum*
  5. *H. rodentium*

- Which of the following *Helicobacter* species are **urease positive**?
  1. ***H. hepaticus***
  2. ***H. bilis***
  3. ***H. pylori***
  4. ***H. muridarum***
  5. *H. rodentium*

- What strain is the mouse shown?
  1. BALB/c
  2. FVB/N
  3. A/J
  4. C3H/HeJ
  5. C57BL/6

- What strain is the mouse shown?
  1. BALB/c
  2. FVB/N
  3. A/J
  4. **C3H/HeJ**
  5. C57BL/6

This strain carries the *Pde6b*^{rd1} mutation. What is the resultant phenotype?

Alopecia: Possible Causes and Treatments, Particularly in Captive Nonhuman Primates

Melinda A Novak[1-3,*] and Jerrold S Meyer[1,2]

Alopecia (hair loss) occurs in some nonhuman primates housed in captivity and is of concern to colony managers and veterinarians. Here we review the characteristics, potential causes, and treatments for this condition. Although we focus on nonhuman primates, relevant research on other mammalian species is discussed also, due to the relative paucity of studies on alopecia in the primate literature. We first discuss the cycle of hair growth and explain how this cycle can be disrupted to produce alopecia. Numerous factors may be related to hair loss and range from naturally occurring processes (for example, seasonality, aging) to various biologic dysfunctions, including vitamin and mineral imbalances, endocrine disorders, immunologic diseases, and genetic mutations. We also address bacterial and fungal infections, infestation by parasites, and atopic dermatitis as possible causes of alopecia. Finally, we examine the role of psychogenic factors, such as stress. Depending on the presumed cause of the hair loss, various treatment strategies can be pursued. Alopecia in nonhuman primates is a multifaceted disorder with many potential sources. For this reason, appropriate testing for various disease conditions should be completed before alopecia is considered to be related to stress.

Abbreviation: VDR, vitamin D receptor.

4 Stages in Hair Cycle

- Anagen
  - Active growth phase
- Catagen
  - Cessation of cell division
- Telogen
  - ‘Resting’ phase
- Exogen?
  - Expulsion of hair shaft

Shown are the forearms from two macaques aged 24 years (Left) and 9 years (Right). What is the most likely cause of alopecia in the animal on the left?

1. Alopecia areata
2. Age
3. Telogen effluvium
4. Atopic dermatitis
5. *Microsporum canis*

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Telogen Effluvium

- What is the genus and common name?

- What is the genus and common name?
  - *Phodopus campbelli*
  - Djungarian hamster or Russian dwarf

Kinetics of Transmission, Infectivity, and Genome Stability of Two Novel Mouse Norovirus Isolates in Breeding Mice

Jennifer A Kelmenson,[1] Darcy P Pomerleau,[1] Stephen Griffey,[3] Weidong Zhang,[2] Michele J Karolak,[4] and James R Fahey[1,*]

Ponder This…..

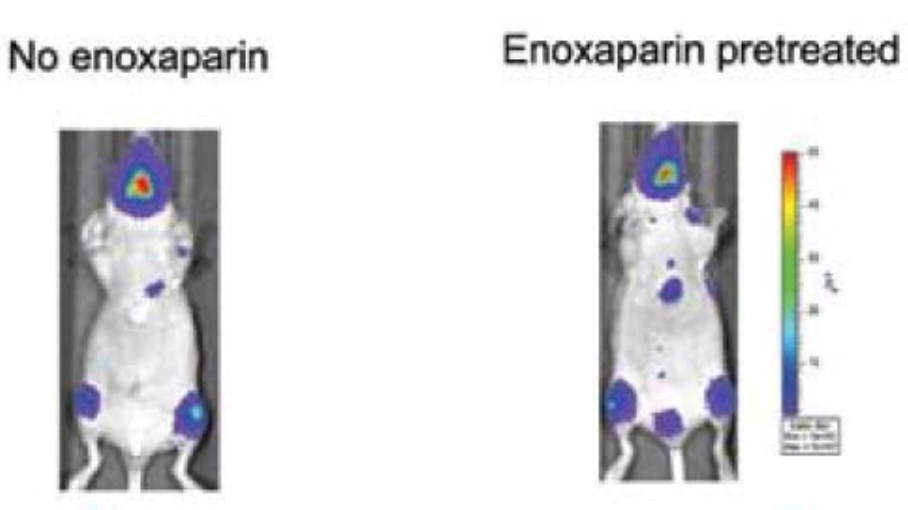
- To what family does Norovirus belong?
- What is RT-PCR?
- What do you know about NOD/ShiLtJ and NOD.CB17-*Prkdc*^{scid}/J mice?

Ponder This…..

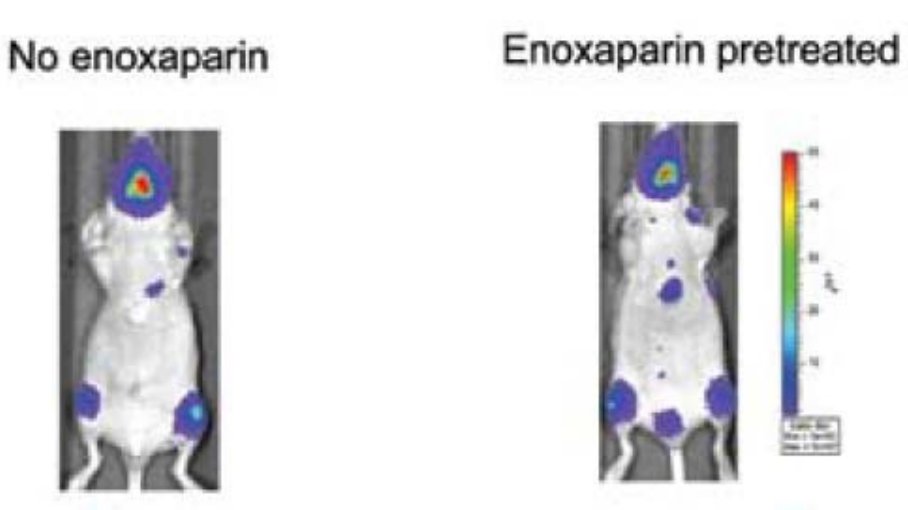
- To what family does Norovirus belong?
  - **Caliciviridae; ssRNA**
  - **High mutation rate**
- What is RT-PCR?
  - **Reverse transcriptase PCR**
- What do you know about NOD/ShiLtJ and NOD.CB17-*Prkdc*^{scid}/J mice?
  - **NOD = Type I diabetes model**
  - **NOD-SCID has reduced ‘leakiness’**

Use of Low-Molecular–Weight Heparin to Decrease Mortality in Mice after Intracardiac Injection of Tumor Cells

Kim L Stocking,[1,*] Jon C Jones,[2] Nancy E Everds,[3] Bernard S Buetow,[3,†] Martine P Roudier,[3] and Robert E Miller[2]



- What imaging modality is shown above?
  1. Positron Emission Tomography
  2. Computed Tomography
  3. Magnetic Resonance Imaging
  4. Immunoflourescence
  5. Bioluminescence



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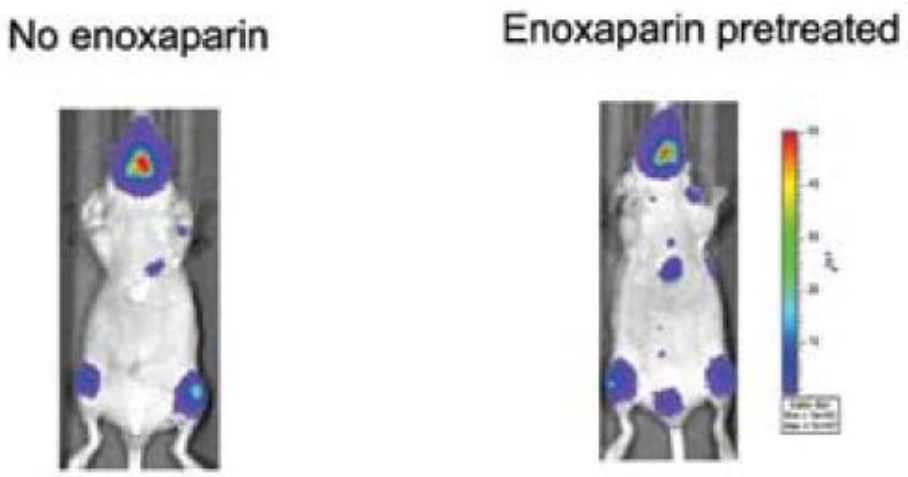
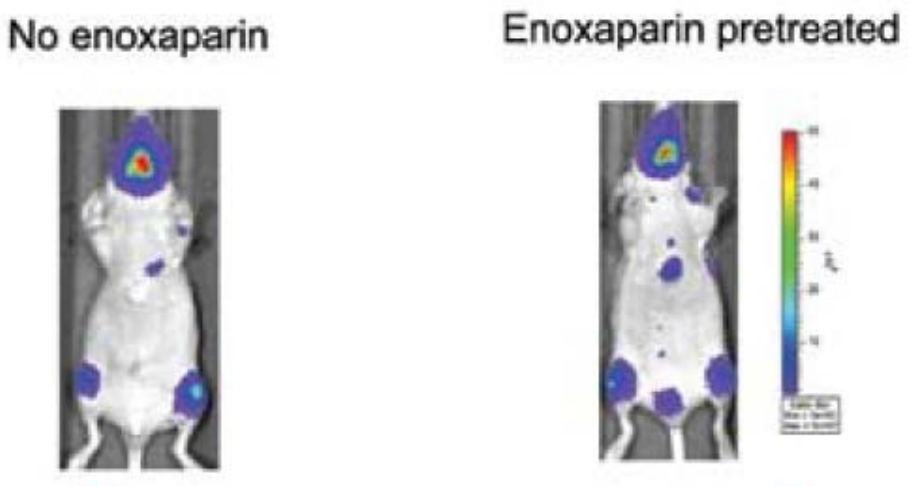
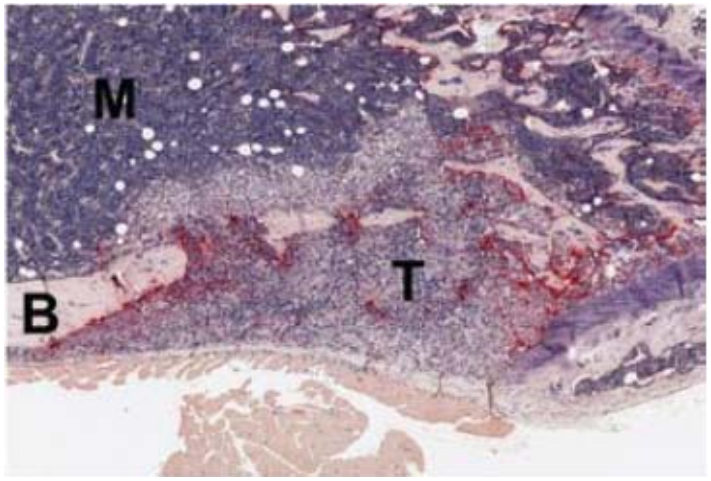


What is the enzyme commonly used?

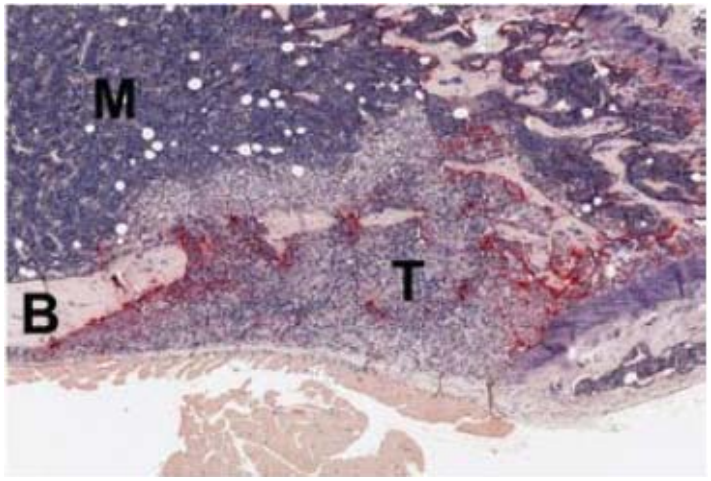


What is the enzyme commonly used?

Luciferase



- The tissue shown above has been subjected to tartrate-resistant acid phosphatase (TRAP) staining. What cell does this identify?
  1. Osteoblasts
  2. Osteoclasts
  3. Medullary endothelial cells
  4. Pluripotent stem cells
  5. B lymphocytes



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Effects of 4-Vinylcyclohexene Diepoxide on Peripubertal and Adult Sprague–Dawley Rats: Ovarian, Clinical, and Pathologic Outcomes

F Salih Muhammad,[1] Amanda K Goode,[3,4] Nancy D Kock,[3,4] Esther A Arifin,[1] J Mark Cline,[3,4] Michael R Adams,[3,4] Patricia B Hoyer,[5] Patricia J Christian,[5] Scott Isom,[2] Jay R Kaplan,[3,4] and Susan E Appt[3,4,*]

- 4-Vinylcyclohexene Diepoxide treated rats can serve as an induced model of what condition in humans?
  1. Type I diabetes mellitus
  2. Type II diabetes mellitus
  3. Parkinson’s disease
  4. Menopause
  5. Osteoporosis

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  1. Type I diabetes mellitus
  2. Type II diabetes mellitus
  3. Parkinson's disease
  4. **Menopause**
  5. **Osteoporosis (indirectly)**

Stock or Strain?

- Sprague-Dawley
- Lewis
- Long-Evans
- Fischer 344
- Wistar
- Brattleboro

Stock or Strain?

- Sprague-Dawley (Stock)
- Lewis (Strain)
- Long-Evans (Stock)
- Fischer 344 (Strain)
- Wistar (Stock)
- Brattleboro (Strain)

Evaluation of Buprenorphine in a Postoperative Pain Model in Rats

Leslie I Curtin,[1] Julie A Grakowsky,[2] Mauricio Suarez,[2] Alexis C Thompson,[3] Jean M DiPirro,[4] Lisa BE Martin,[1] and Mark B Kristal[2,*]

Take Note….

- Hyperalgesia vs Allodynia

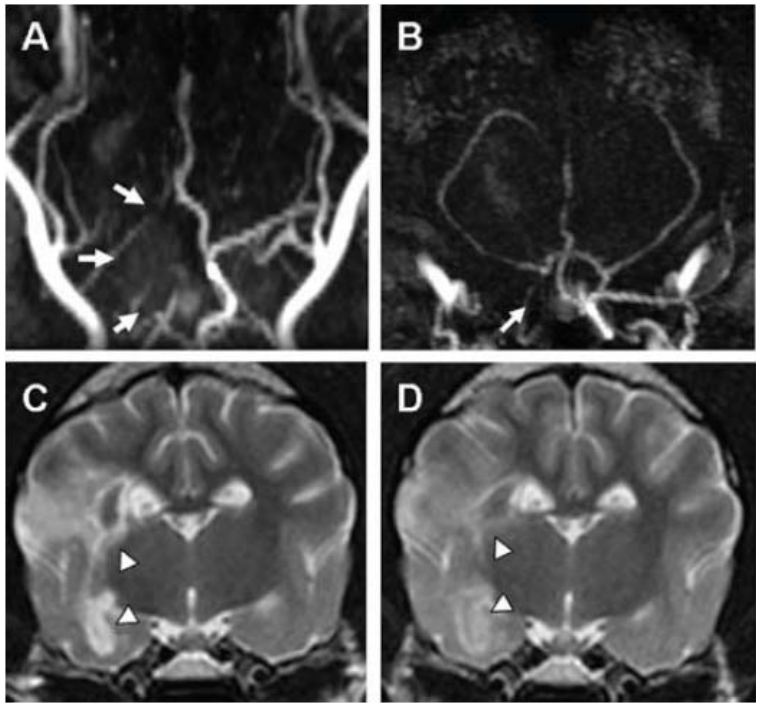
- Tools of analgesiometry
  - Compact force gage
  - Tail withdrawal
  - Open field maze

Three-Dimensional Time-of-Flight Magnetic Resonance Angiography of Intracranial Vessels in a Canine Model of Ischemic Stroke with Permanent Occlusion of the Middle Cerebral Artery

Byeong-Teck Kang,[1] Dong-Pyo Jang,[3] Su-Hyun Gu,[1] Young-Bo Kim,[3] Chae-Young Lim,[1] Jong-Hwan Lee,[2] Eung-Je Woo,[4] Zang-Hee Cho,[3,*] and Hee-Myung Park[1,*]

MRI

- TOF-MRA
  - Relies on moving water molecules. No contrast needed
- Diffusion weighted
  - T1: Fluid Dark
  - T2: Fluid Bright
- Perfusion weighted
- Fluid Attenuation Inversion Recovery (FLAIR)



Refinement of Canine Pancreatitis Model: Inducing Pancreatitis by Using Endoscopic Retrograde Cholangiopancreatography

Dawn S Ruben,* Diana G Scorpio, and Jonathan M Buscaglia

- A Class B dealer acquiring a dog from a pound must hold that dog for how long before selling?
  1. 1 day
  2. 3 days
  3. 5 days
  4. 7 days
  5. 10 days

- A Class B dealer acquiring a dog from a pound must hold that dog for how long before selling?
  1. **1 day (if 5 or 10 day period already satisfied)**
  2. 3 days
  3. **5 days (if acquired from another source)**
  4. 7 days
  5. **10 days**

Take Note….

- *Borrelia burgdorferi*
- *Dirofilaria immitis*
- *Ehrlichia canis*
- *Anaplasma phagocytophilum*

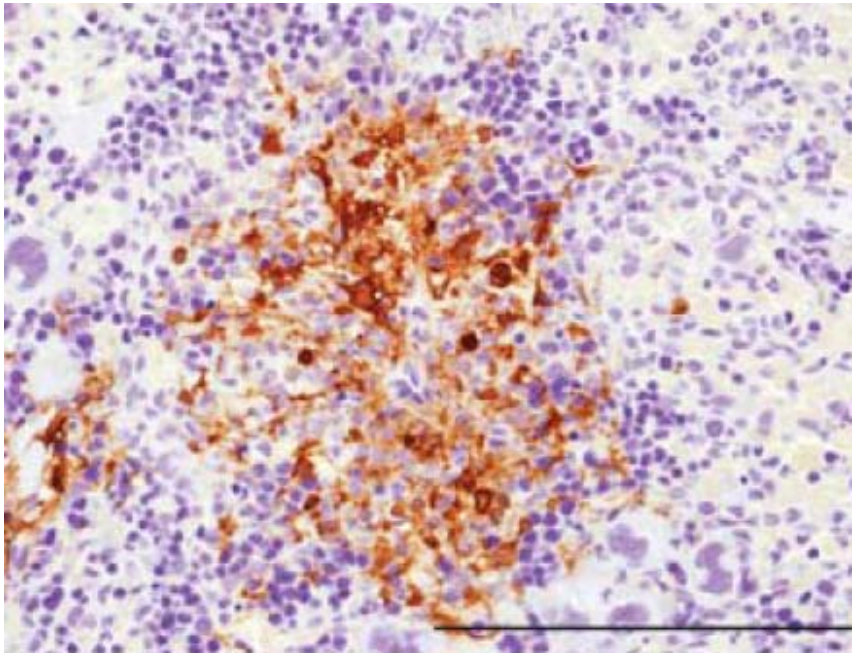
Extreme Susceptibility of African Naked Mole Rats (*Heterocephalus glaber*) to Experimental Infection with Herpes Simplex Virus Type 1

James Artwohl,[1,*] Susan Ball-Kell,[2] Tibor Valyi-Nagy,[1] Steven P Wilson,[3] Ying Lu,[4] and Thomas J Park[1]

Take Note….

- Genus and species of the African Naked Mole Rat?
- To what family does HSV1 belong? Cytomegalovirus?
- What herpes virus of macaques also belongs to this family?
- Some molecular biology
  - HindIII sites, LacZ

- The image shown depicts tissue processed using what method?
    1. Immunoflourescent antibody staining
    2. Immunohistochemistry
    3. Warthin-starry stain
    4. Fite-Faraco stain
    5. Congo red stain



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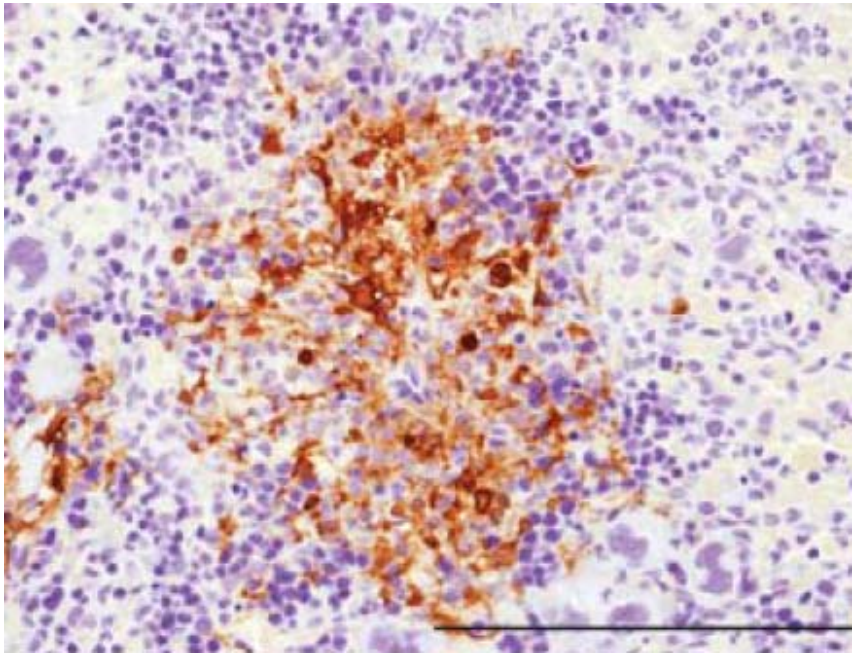

Volume 59 (2)
April, 2009

Enhancing the Ability of Experimental Autoimmune Encephalomyelitis to Serve as a More Rigorous Model of Multiple Sclerosis through Refinement of the Experimental Design

Mitchell R Emerson,[1] Ryan J Gallagher,[2,†] Janet G Marquis,[3] and Steven M LeVine[2,*]

EAE Model

- Administration of encephalitogenic compound with adjuvant to induce T-cell activity against myelin

What is the difference between CFA and IFA?

1. CFA lacks mycobacterial cell components
2. IFA lacks mycobacterial cell components
3. IFA is a water-in-oil adjuvant
4. IFA is an oil-in-water adjuvant
5. CFA acts in a classic depot-forming fashion

EAE Model

- Administration of encephalitogenic compound with adjuvant to induce T-cell activity against myelin

What is the difference between CFA and IFA?

1. CFA lacks mycobacterial cell components (False)
2. **IFA lacks mycobacterial cell components**
3. IFA is a water-in-oil adjuvant (True)
4. IFA is an oil-in-water adjuvant (False)
5. CFA acts in a classic depot-forming fashion (True)

The Spatial Learning Phenotype of Heterozygous *Leaner* Mice is Robust to Systematic Variation of the Housing Environment

Joana M Marques,[1,4,5] Isabel Alonso,[2] Cristina Santos,[3] Isabel Silveira,[2] and I Anna S Olsson[1,*]

B6.Cg-*Os* +/+ *Cacna1a*$^{tg\text{-}la}$/J

vs

B6;Cg-*Os* +/+ *Cacna1a*$^{tg\text{-}la}$/J

Novel Pathologic Findings Associated with Urinary Retention in a Mouse Model of Mucopolysaccharidosis Type IIIB

Sylvia I Gografe,[1,7,*] Paul R Sanberg,[1-5] Wilfredo Chamizo,[6] Hector Monforte,[6] and Svitlana Garbuzova-Davis[1-3,5]

Take Note…

- Alcian blue stain
- PAS stain
- B6.129S6-*Naglu*^{tm1Efn}

Take Note…

- Alcian blue stain
  - Sulfated mucosubstances e.g. heparin sulfate
- PAS stain
  - Polysaccharides
- B6.129S6-*Naglu*^{tm1Efn}
  - Congenic currently on B6 genetic background; targeted mutation of the *Naglu* gene created by Elizabeth Neufield at UCLA originally on a 129 strain

Effect of Inositol Hexaphosphate on the Development of UVB-Induced Skin Tumors in SKH1 Hairless Mice

Krishnan Kolappaswamy,[1-3] Kendra A Williams,[4] Cinzia Benazzi,[6] Giuseppe Sarli,[6] Charles G McLeod Jr,[1] Ivana Vucenik,[2,4] and Louis J DeTolla,[1-3,5,*]

The mouse shown carries the *Hr*^{hr} mutation. What is true about the phenotype?

1. Diminished T helper cell function
2. Complete lack of vibrissae
3. Diminished B-cell function
4. Absence of a thymus
5. Development of curly toe nails

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- Which of the following is true about light classified as ultraviolet B?
  1. Wavelength of 320-400 nm
  2. Wavelength of 280-320 nm
  3. Wavelength of 100-280 nm
  4. It is considered germicidal
  5. Interaction with chlorinated compounds may generate phosgene gas

- Which of the following is true about light classified as ultraviolet B?
  1. Wavelength of 320-400 nm (UV-A)
  2. **Wavelength of 280-320 nm**
  3. Wavelength of 100-280 nm (UV-C)
  4. It is considered germicidal (UV-C)
  5. **Interaction with chlorinated compounds may generate phosgene gas**

Intestinal Cytokine mRNA Expression in Canine Inflammatory Bowel Disease: A Meta-Analysis with Critical Appraisal

Albert E Jergens,[1,*] Ioana M Sonea,[4] Annette M O'Connor,[2] Linda K Kauffman,[1] Sinisa D Grozdanic,[1] Mark R Ackermann,[3] and Richard B Evans[5]

- What is the purpose of the “RT” reaction performed as part of running RT-PCR?
  1. To generate mRNA
  2. To generate rRNA
  3. To generate tRNA
  4. To generate cDNA
  5. To generate DNA

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4. **To generate cDNA**
5. To generate DNA

- The statistical alpha value is most commonly chosen to be 0.05. What is the effect of choosing 0.10?
  1. The power of the statistical test goes up
  2. The power of the statistical test goes down
  3. The chance for a Type I error goes up
  4. The chance for a Type II error goes up
  5. The chance for a Type II error goes down

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Bovine Colostral Antibody Against Verotoxin 2 Derived from *Escherichia coli* O157:H7: Resistance to Proteases and Effects in Beagle Dogs

Takashi Kuribayashi,[1] Tetsuro Seita,[1] Mariko Matsumoto,[1] Katsunori Furuhata,[2] Kazutoshi Tagata,[1] and Shizuo Yamamoto[1,*]

- VERO cells originated from what animal?
  1. Macaca mulatta
  2. Pogona vitticeps
  3. Chlorocebus aethiops
  4. Erythrocebus patas
  5. Aotus nancymaae

- VERO cells originated from what animal?
  1. Macaca mulatta (Rhesus macaque)
  2. Pogona vitticeps (Bearded dragon)
  3. **Chlorocebus aethiops (Vervet monkey)**
  4. Erythrocebus patas (Patas monkey)
  5. Aotus nancymaae (Owl monkey)

Serologic Evaluation of Clinical and Subclinical Secondary Hepatic Amyloidosis in Rhesus Macaques (*Macaca mulatta*)

Jamus G MacGuire,* Kari L Christe, JoAnn L Yee, Alexis L Kalman-Bowlus, and Nicholas W Lerche

- Retroperitoneal fibromatosis is associated with what virus?
  1. Simian immunodeficiency virus
  2. Simian T lymphotropic virus
  3. Simian retrovirus type D1
  4. Simian retrovirus type D2
  5. Herpesvirus simplex 1

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- What stain is used to detect amyloid?
  1. Oil red O
  2. Alizarin red
  3. Congo red
  4. Geimsa
  5. Warthin-Starry

- What stain is used to detect amyloid?
  1. Oil red O (Triglycerides)
  2. Alizarin red (Calcification)
  3. **Congo red**
  4. Geimsa (Blood smears)
  5. Warthin-Starry (Silver stain)

Treatment of Giardiasis in Common Marmosets (*Callithrix jacchus*) with Tinidazole

Joshua A Kramer, Audra M Hachey, Lynn M Wachtman, and Keith G Mansfield*

Giardia intestinalis is a common protozoan parasite that can infect many laboratory animal primates, although its role as a contributor to the induction of gastrointestinal disease remains unclear. This study sought to investigate the prevalence of *Giardia* in a colony of common marmosets by using a *Giardia* antigen-capture assay and to address the possible eradication of this infection by using tinidazole, an antiprotozoal similar to metronidazole but requiring fewer doses. Among 31 colony marmosets, 13 (42%) were positive for *Giardia*. Two doses of oral tinidazole eliminated the infection in all animals. Repeat testing of the 13 *Giardia*-positive monkeys 1 y later showed that 11 remained negative and that treated animals had a significant increase in weight at 1 y. *Giardia* antigen is common in common marmoset feces, and treatment using oral tinidazole is possible and highly effective.

- A chronic wasting syndrome is routinely observed in which NHP species?
  1. Macaca fascicularis
  2. Pan troglodytes
  3. Saguinus oedipus
  4. Callithrix jacchus
  5. Cebus apella

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  2. Pan troglodytes
  3. Saguinus oedipus
  4. **Callithrix jacchus**
  5. Cebus apella

Mousepox Detected in a Research Facility: Case Report and Failure of Mouse Antibody Production Testing to Identify *Ectromelia Virus* in Contaminated Mouse Serum

Philippe Labelle,[1] Nina E Hahn,[4] Jenelle K Fraser,[1] Lonnie V Kendall,[2] Melanie Ziman,[3] Edward James,[5] Nilabh Shastri,[5] and Stephen M Griffey[1,*]

Good Pox Virus Tidbits

- Ectromelia virus
  - Poxviridae; Orthopoxvirus; dsDNA;
- Orf?
- Monkey pox?
- Yabapox and tanapox?

Good Pox Virus Tidbits

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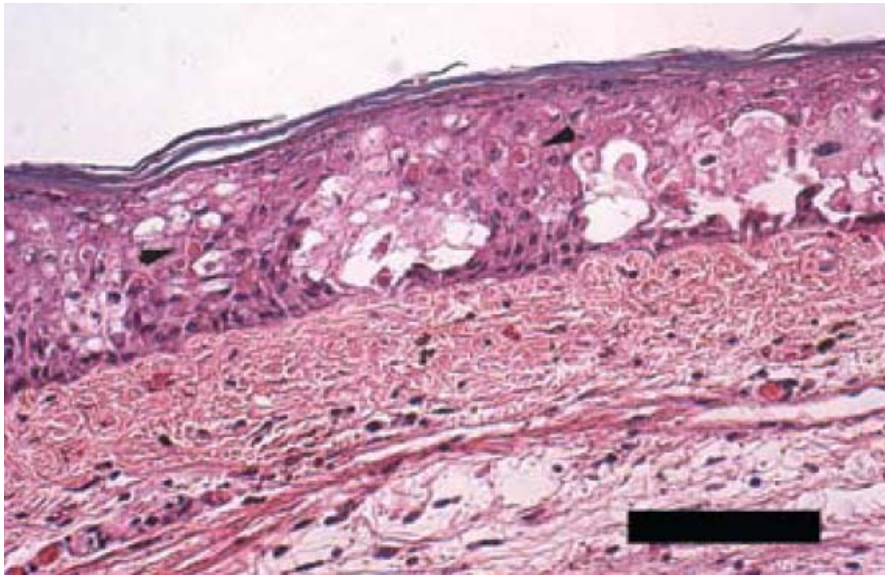
- Yabapox and tanapox?
  - Yatapox



Ralstonia pickettii-Induced Ataxia in Immunodeficient Mice

Marion Berard,[1] Christine Medaille,[2] Meredith Simon,[3] Stéphanie Serre,[4] Kathleen Pritchett-Corning,[4] and Virginie Dangles-Marie[5,6,*]

Take Note…

- B6.129-*Rag*^{tmFwa}
  - Lack what cells?
- HEPA filter
  - Filters particles of what size?
- Name a tissue Gram stain

Take Note…

- B6.129-*Rag*^{tmFwa}
  - B and T lymphocytes
- HEPA filter
  - 99.97% of particles 0.3um in diameter
- Name a tissue Gram stain
  - Brown and Brenn

Volume 59(3)

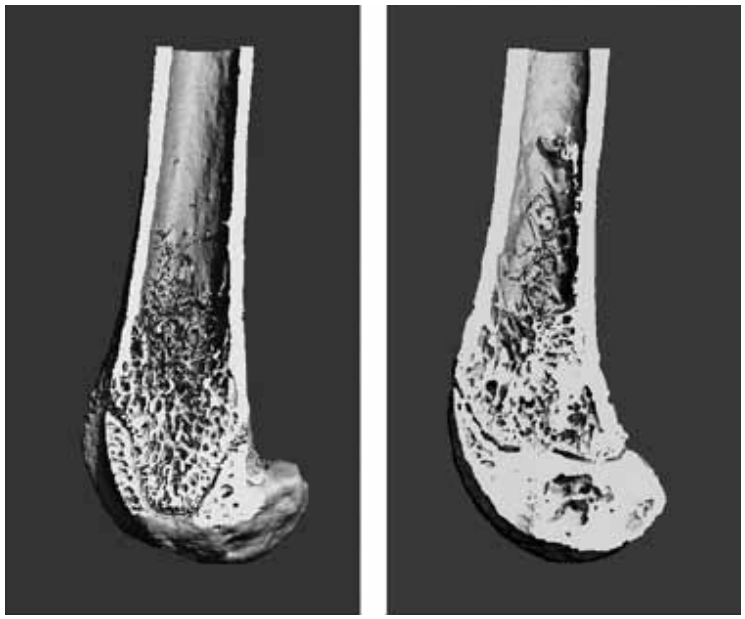
June, 2009

Deletion of Mitogen-Activated Protein Kinase Phosphatase 1 Modifies the Response to Mechanical Bone Marrow Ablation in a Mouse Model

Jodi Carlson,[1,*] Qing Zhang,[2] Anton Bennett,[3] and Agnès Vignery[2]

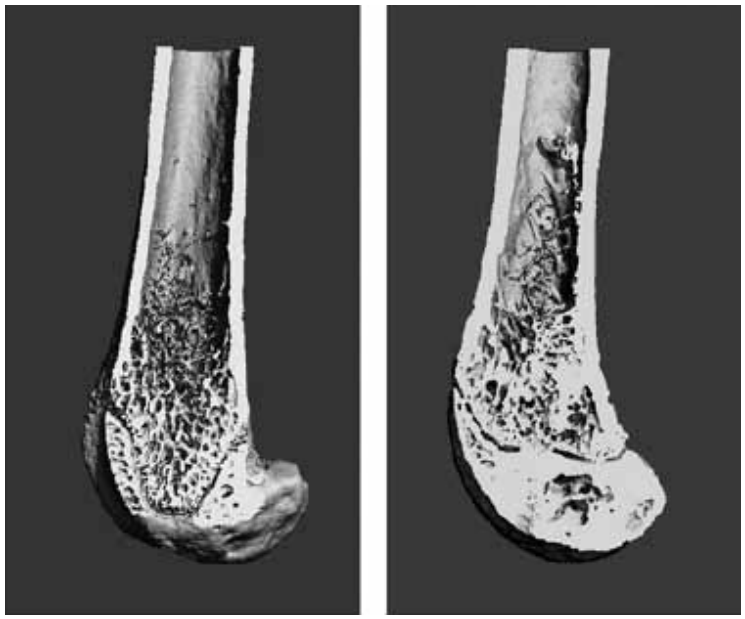
What imaging modality was used to generate the image shown?

1. Micro PET
2. Micro CT
3. T1 weighted MRI
4. T2 weighted MRI
5. Bioluminescence



What imaging modality was used to generate the image shown?

1. Micro PET
2. **Micro CT**
3. T1 weighted MRI
4. T2 weighted MRI
5. Bioluminescence



Moxidectin Toxicity in Senescence-Accelerated Prone and Resistant Mice

Vanessa K Lee,[1,*] Asheesh K Tiwary,[4] Prachi Sharma-Reddy,[3] Karen A Lieber,[1] Douglas K Taylor,[1,2] and Deborah M Mook[1,2]

- The “SAMP8” mouse is most commonly used to study what?
  1. Renal dysfunction
  2. Type I diabetes mellitus
  3. Type II diabetes mellitus
  4. Aging changes
  5. Alzheimer’s disease

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2. Type I diabetes mellitus
3. Type II diabetes mellitus
4. **Aging changes**
5. **Alzheimer’s disease**

Endpoints for Mouse Abdominal Tumor Models: Refinement of Current Criteria

Eden V Paster,[1] Kimberly A Villines,[2] and Debra L Hickman[3,*]

Hybridomas are used for what purpose?

1. To study metastatic disease
2. To create targeted mutations
3. To create monoclonal antibodies
4. To create polyclonal antibodies
5. To create F1 hybrid mouse strains

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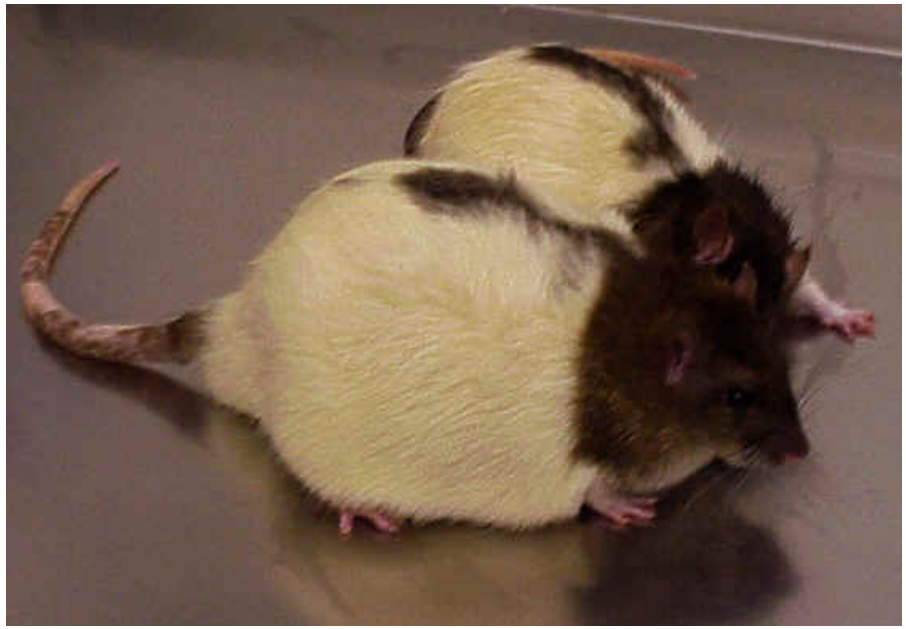
Use of Fat-Fed Rats to Study the Metabolic and Vascular Sequelae of Obesity and β-Adrenergic Antagonism

Melinda Frye,[1,†,*] Ivan McMurtry,[1,‡] E Christopher Orton,[3] and Karen Fagan[2,§]

- Shown in the image is a Zucker fatty rat. What is the genetic mutation?
  1. *Fa^{lep}*
  2. *Lep^{fa}*
  3. *Fa^{lepr}*
  4. *Lepr^{fa}*
  5. *Lep^{fat}*



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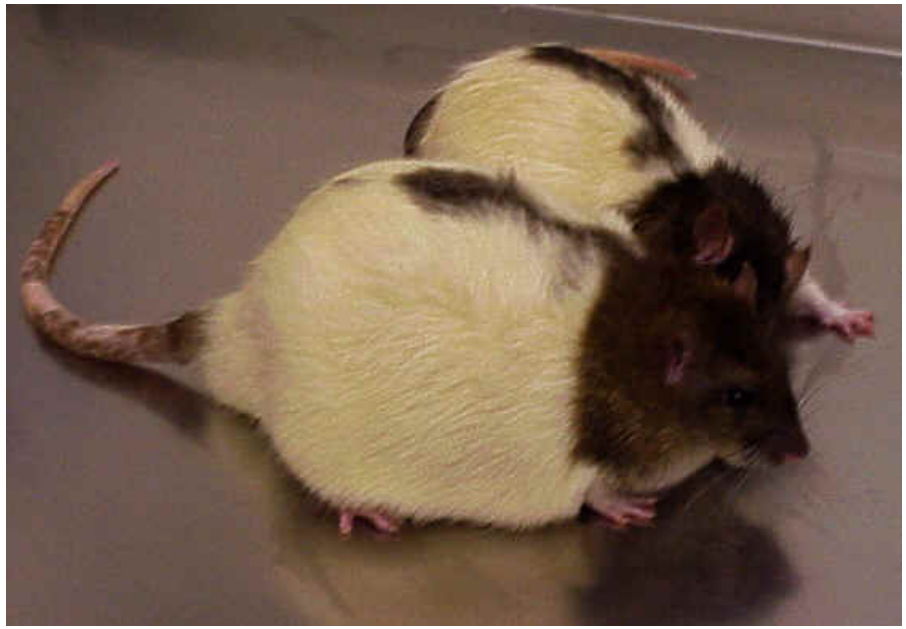

What is the corresponding mutation in the mouse?

What is the corresponding mutation in the mouse?

Lepr^{db}

What is the corresponding mutation in the mouse?

Lepr^{db}

Lep^{ob}

The Unilateral Urogenital Anomalies (UUA) Rat: A New Mutant Strain Associated with Unilateral Renal Agenesis, Cryptorchidism, and Malformations of Reproductive Organs Restricted to the Left Side

Kohei Amakasu, Katsushi Suzuki, and Hiroetsu Suzuki*

- The UUA rat compares most closely with what other strain that also exhibits renal agenesis?
    1. Long-Evans cinnamon
    2. Gunn
    3. Wistar
    4. August Copenhagen
    5. Brattleboro

- The UUA rat compares most closely with what other strain that also exhibits renal agenesis?
  1. Long-Evans cinnamon (Copper storage disorder)
  2. Gunn (Crigler-Najjar syndrome)
  3. Wistar (Outbred stock)
  4. **August Copenhagen**
  5. Brattleboro (Diabetes Insipidus)

- Relative to the Wistar rat, what term best describes the UUA rat?
  1. Inbred
  2. Hybrid
  3. Outbred
  4. Congenic
  5. Coisogenic

- Relative to the Wistar rat, what term best describes the UUA rat?
  1. Inbred
  2. Hybrid
  3. Outbred
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  5. **Coisogenic**

The Physiologic Responses of Dutch Belted Rabbits Infected with Inhalational Anthrax

William S Lawrence,[1,*] Jason M Hardcastle,[1] Douglas L Brining,[2] Lori E Weaver,[2] Cindy Ponce,[1] Elbert B Whorton,[3] and Johnny W Peterson[1]

Take Note….

- Wirtz-Conklin differential spore stain
- *Bacillus anthracis* toxins
  - Lethal and edema
- *B. anthracis* as select agent
  - “Overlap” agent
  - BMBL recommends handling at BSL 2 or 3 depending on nature of the work (ABSL 3 in this study)

Assessing Anticalcification Treatments in Bioprosthetic Tissue by Using the New Zealand Rabbit Intramuscular Model

Gregory A Wright,* Joelle M Faught, and Jane M Olin

Raman Spectroscopy

- Identifies the nature of chemical bonds by their interaction with photons and the subsequent scatter
  - In this study, type of calcium salt identified

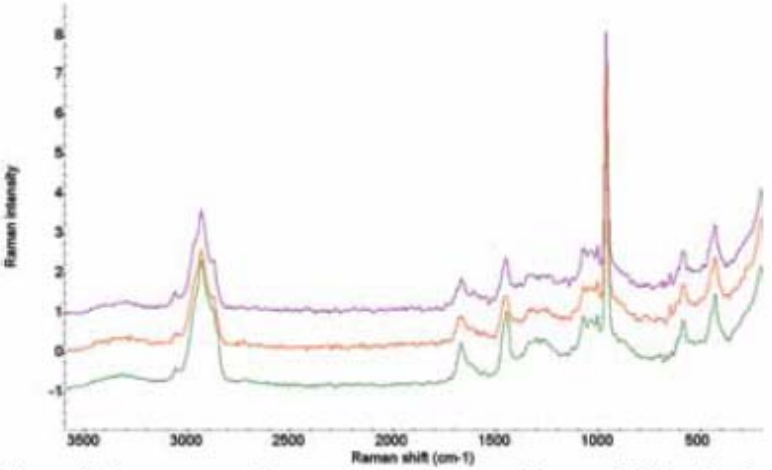

Figure 1. Raman spectral map of intensity versus Raman shift (cm^{-1}) collected from a human explanted valve (purple), rabbit intramuscular explant (red), and the spectrum from the Raman standards library (green).

Left Ventricular Remodeling after Myocardial Infarction: Characterization of a Swine Model on β-Blocker Therapy

Franca S Angeli, Mia Shapiro , Nicolas Amabile, Gina Orcino, Charles S Smith, Theresa Tacy, Andrew J Boyle, Kanu Chatterjee, Stanton A Glantz, William Grossman, and Yerem Yeghiazarians*

- What feature of the swine cardiac vasculature make it very well-suited for studies of human heart disease?
  1. Coronary blood flow is predominantly left-sided
  2. Coronary blood flow is predominantly right-sided
  3. Collateral circulation is extensive
  4. The LAD coronary artery is easily occluded
  5. The left circumflex artery is easily occluded

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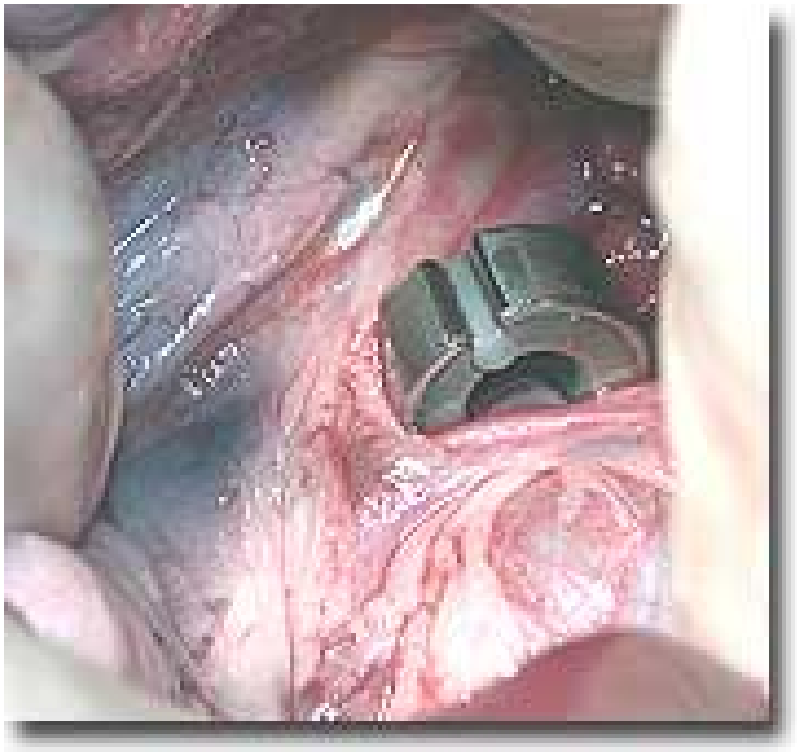

- What is the device shown?

Comparison of 3 Methods to Induce Acute Pulmonary Hypertension in Pigs

Anna B Roehl,[1] Paul Steendijk,[2] Jan H Baumert,[1] Joerg Schnoor,[1] Rolf Rossaint,[1] and Marc Hein[1,*]

Take Note…

- Methods of inducing pulmonary hypertension
  - Pulmonary artery banding
  - Pulmonary artery occlusion (transient)
  - Microbead infusion
  - Thromboxane A2 infusion

Comparison of Biomarkers of Oxidative Stress and Cardiovascular Disease in Humans and Chimpanzees (*Pan troglodytes*)

Elaine N Videan,[1,*] Christopher B Heward,[2] Kajal Chowdhury,[2,3] John Plummer,[2] Yali Su,[2] and Richard G Cutler[2]

Volume 59 (4)
August, 2009

Pulmonary Inflammation and Airway Hyperresponsiveness in a Mouse Model of Asthma Complicated by Acid Aspiration

Jean A Nemzek[1,*] and Jiyoun Kim[2]

- What is the genus and species of the organism shown above?
  1. *Caenorhabditis elegans (nematode)*
  2. *Drosophila melanogaster (fruit fly)*
  3. *Aplysia californica (sea hare)*
  4. *Blatella germanica*
  5. *Dasypus novemcinctus (9-banded armadillo)*

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  4. ***Blatella germanica***
  5. *Dasypus novemcinctus (9-banded armadillo)*

Decreased Growth Factor Expression through RNA Interference Inhibits Development of Mouse Preimplantation Embryos

Tedla D Dadi, Ming W Li, and K C Kent Lloyd*

- Which of the following is a standard protocol to induce superovulation in mice?
  1. PMSG followed 48 hours later by hCG
  2. PMSG followed 12 hours later by hCG
  3. PMSG followed 48 hours later by progesterone
  4. FSH followed 48 hours later by hCG
  5. FSH followed 48 hours later by LH

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Lots of Molecular Stuff

- RNA interference technology
- IFA
- Western blotting
- TUNEL assay

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  - Way to knock down gene expression
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  - Label cell antigens
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  - Way to knock down gene expression
- IFA
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- Western blotting
  - Label proteins
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Lots of Molecular Stuff

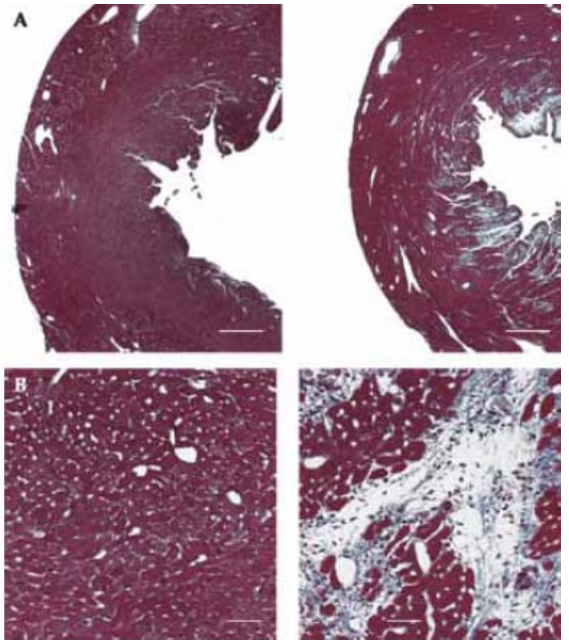
- RNA interference technology
  - Way to knock down gene expression
- IFA
  - Label cell antigens
- Western blotting
  - Label proteins
- TUNEL assay
  - Assay for apoptosis

Isoproterenol-Induced Myocardial Injury and Diastolic Dysfunction in Mice: Structural and Functional Correlates

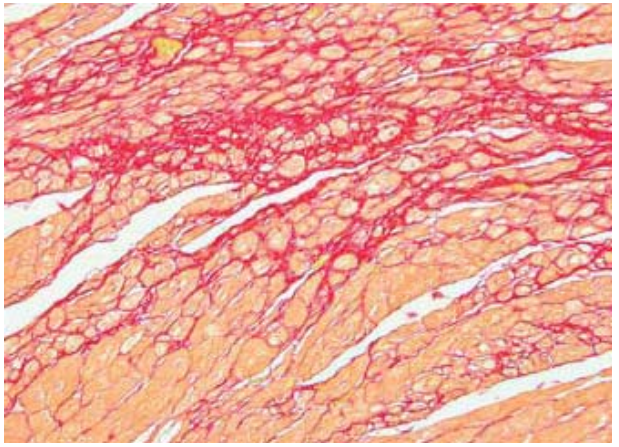
Wesley W Brooks* and Chester H Conrad

Special Stains

- Masson’s Trichrome



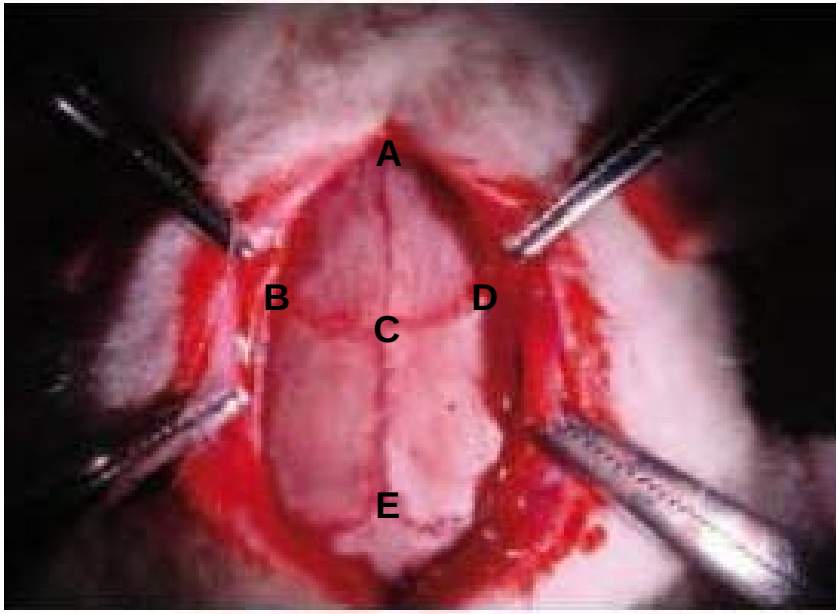
- Picrosirius red



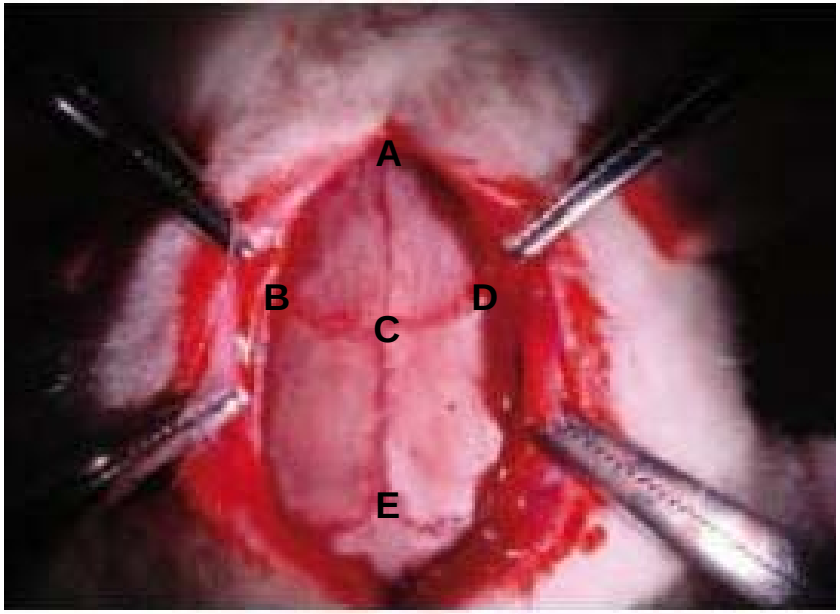
Altered Sleep Patterns and Physiologic Characteristics in Spontaneous Dwarf Rats

Monica L Andersen,* Kil S Lee, Camila Guindalini, Waldemarks A Leite, Magda Bignotto, and Sergio Tufik

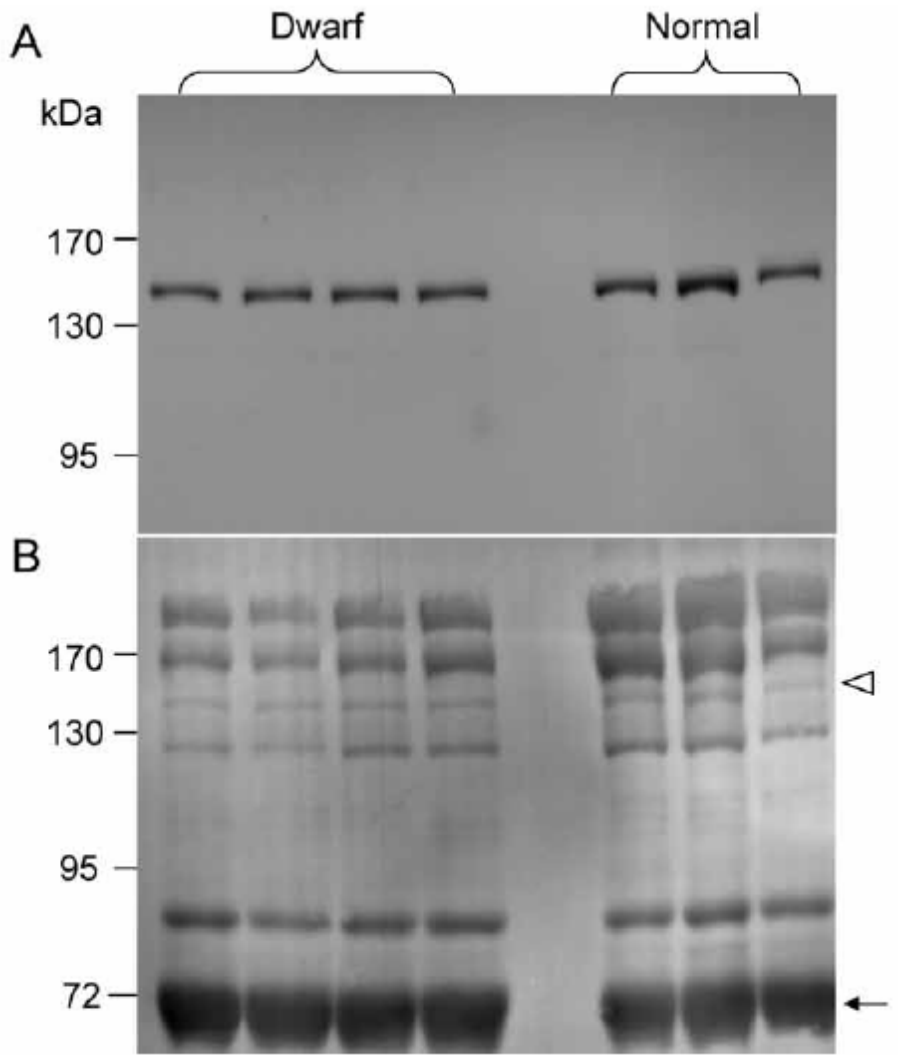
- Where is Bregma in the image shown?
  1. A
  2. B
  3. C
  4. D
  5. E



- Where is Bregma in the image shown?
  1. A
  2. B
  3. **C**
  4. D
  5. E (Lambda)

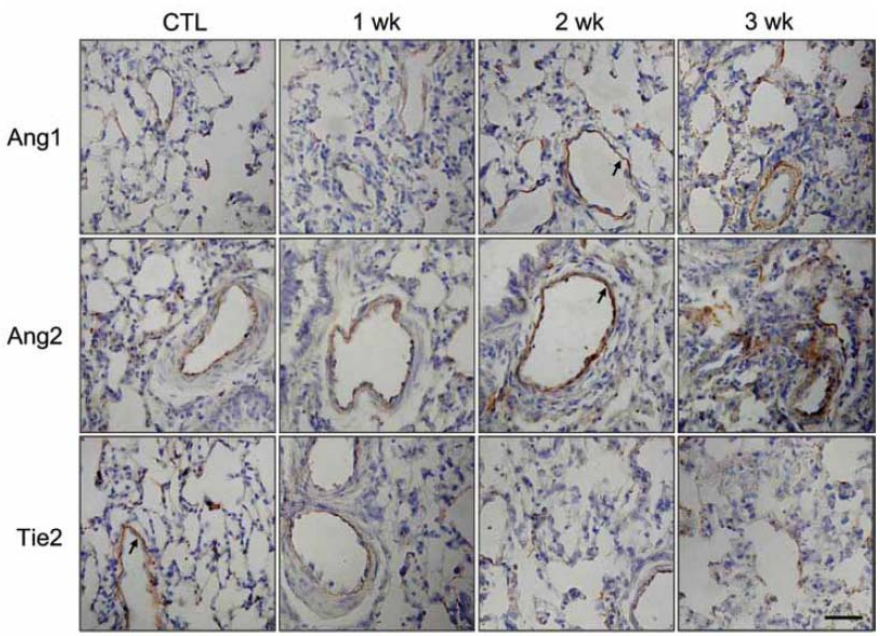


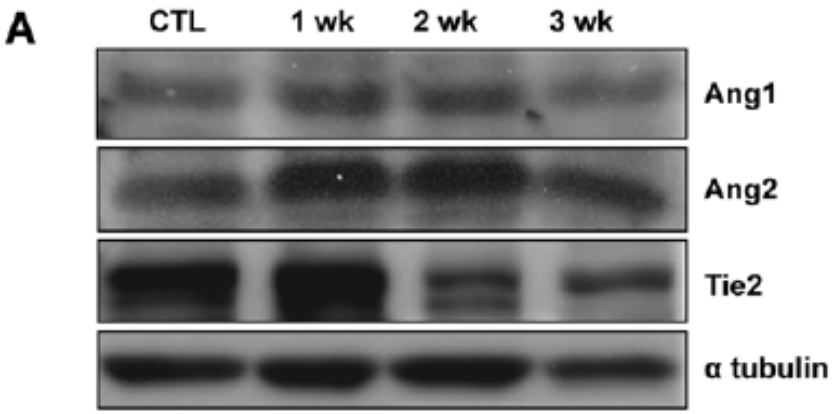
Immunoblotting

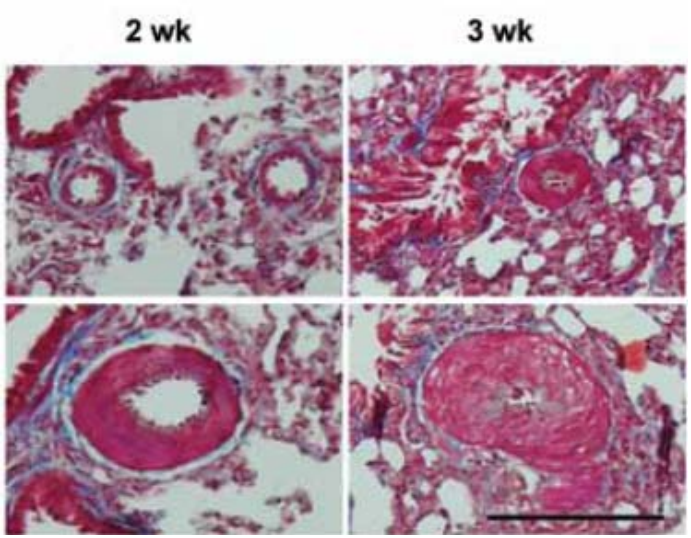


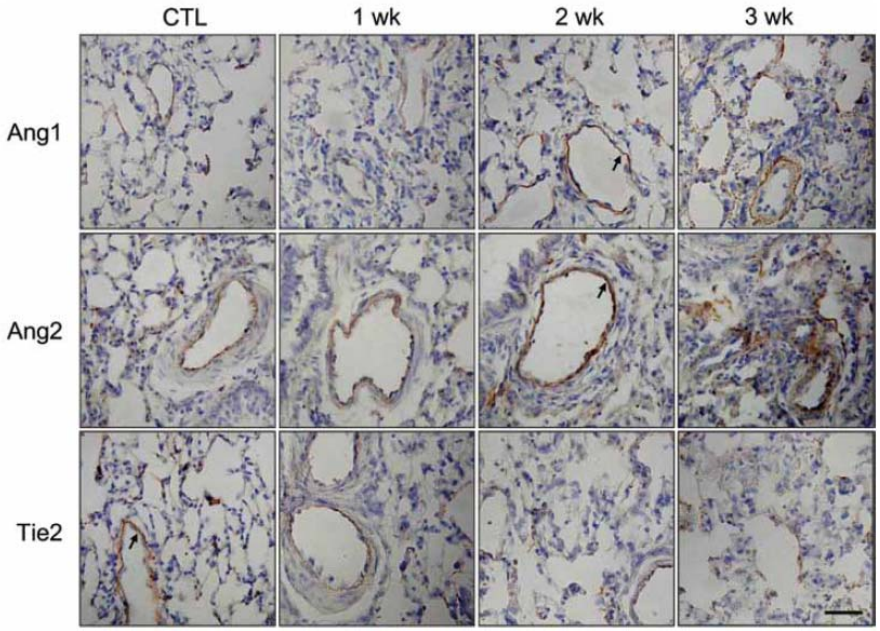
Temporal Changes of Angiopoietins and Tie2 Expression in Rat Lungs after Monocrotaline-Induced Pulmonary Hypertension

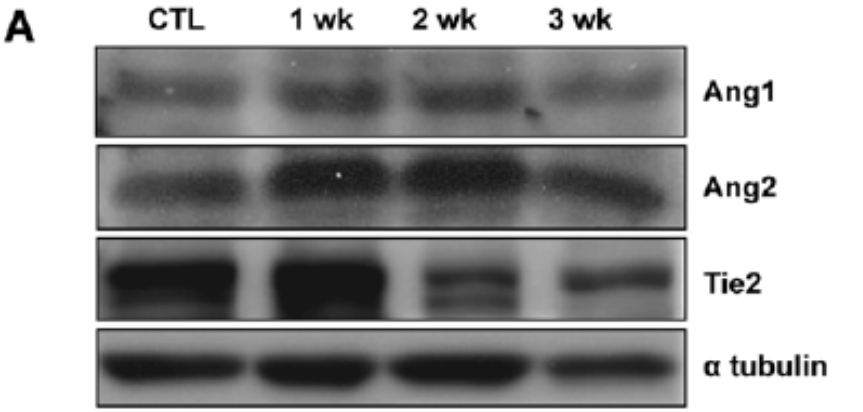
Yu Ji Cho,[2] Jae Yoon Han,[1] Sang Gab Lee,[2] Byeong Tak Jeon,[1] Wan Sung Choi,[1] Young Sil Hwang,[2] Gu Seob Roh,[1,*] and Jong Deog Lee[2,*]

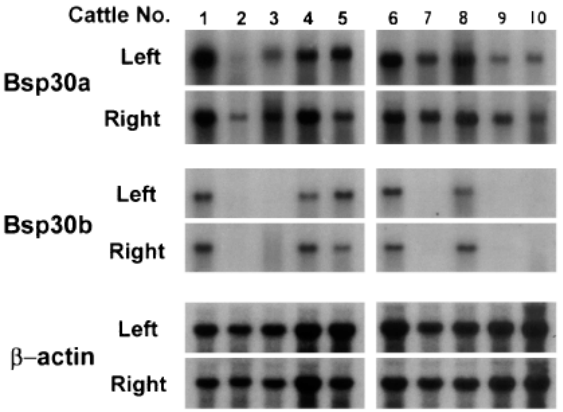

CTL
1 wk
2 wk
3 wk
Ang1
Ang2
Tie2

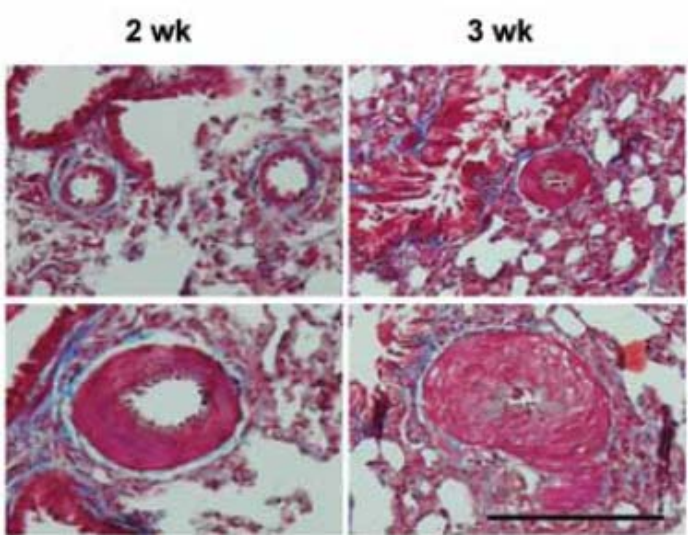

A
CTL
1 wk
2 wk
3 wk
Ang1
Ang2
Tie2
α tubulin

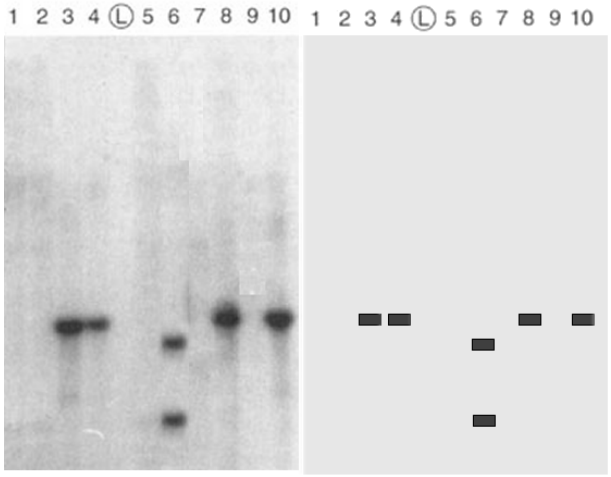

2 wk
3 wk


CTL
1 wk
2 wk
3 wk
Ang1
Ang2
Tie2


A
CTL
1 wk
2 wk
3 wk
Ang1
Ang2
Tie2
α tubulin

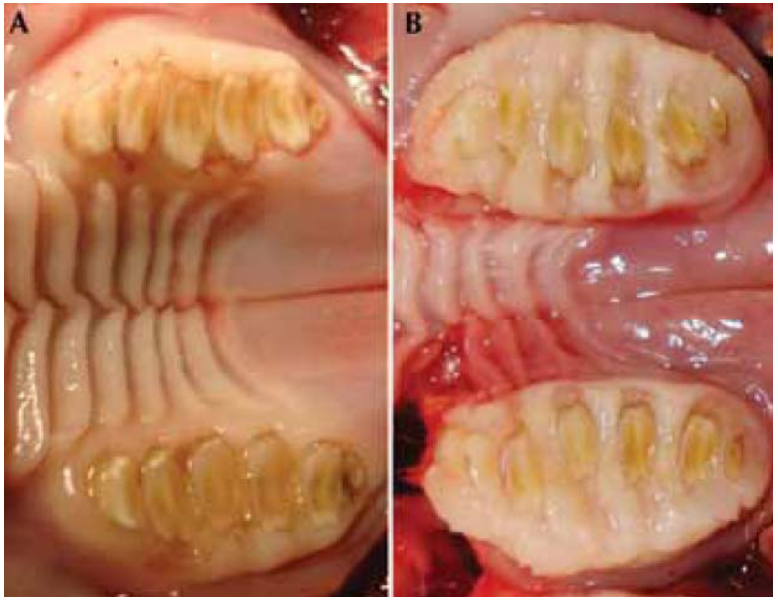

Cattle No.
1 2 3 4 5 6 7 8 9 10
Bsp30a
Left
Right
Bsp30b
Left
Right
β–actin
Left
Right


2 wk
3 wk

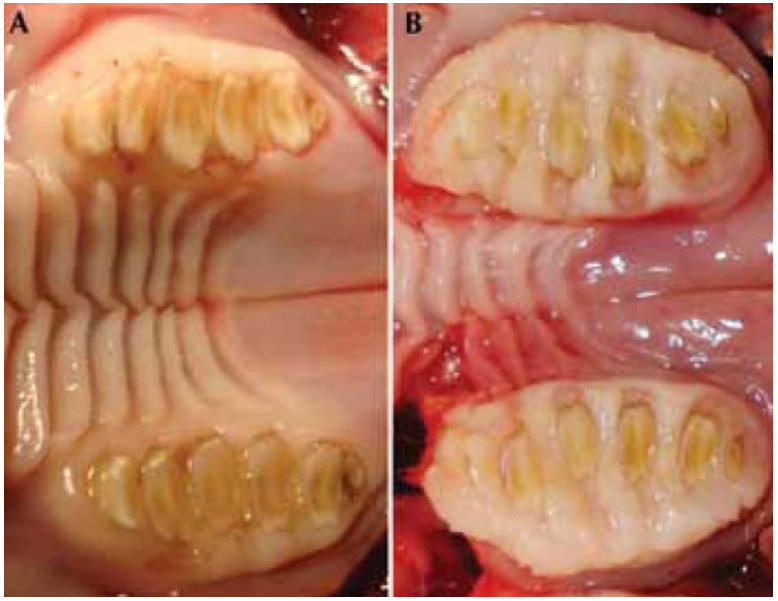

1 2 3 4 L 5 6 7 8 9 10
1 2 3 4 L 5 6 7 8 9 10

Cyclosporine-Induced Gingival Overgrowth in New Zealand White Rabbits (*Oryctolagus cuniculus*)

Sherrie M Jean,[1,*] Prachi Sharma,[3] Douglas Taylor,[1,2] and Deborah Mook[1,2]



- The condition shown is induced by administration of what compound?
  1. Azithromycin
  2. Erythromycin
  3. Streptomycin
  4. Cyclosporine
  5. Doxyrubicin



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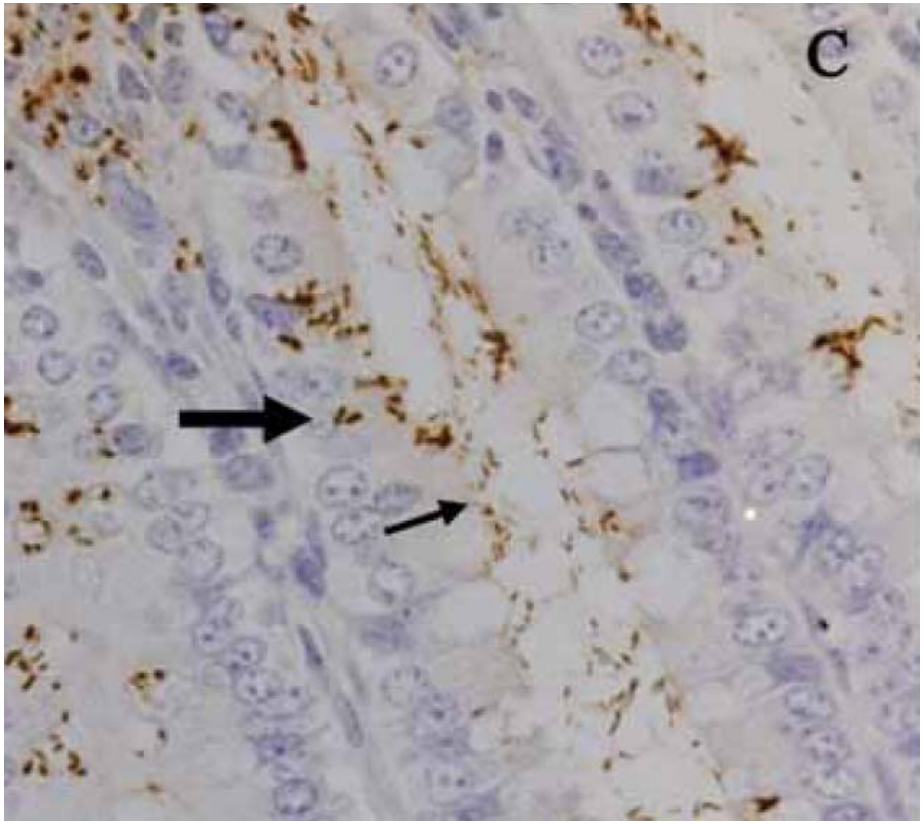
  4. **Cyclosporine**
  5. Doxyrubicin

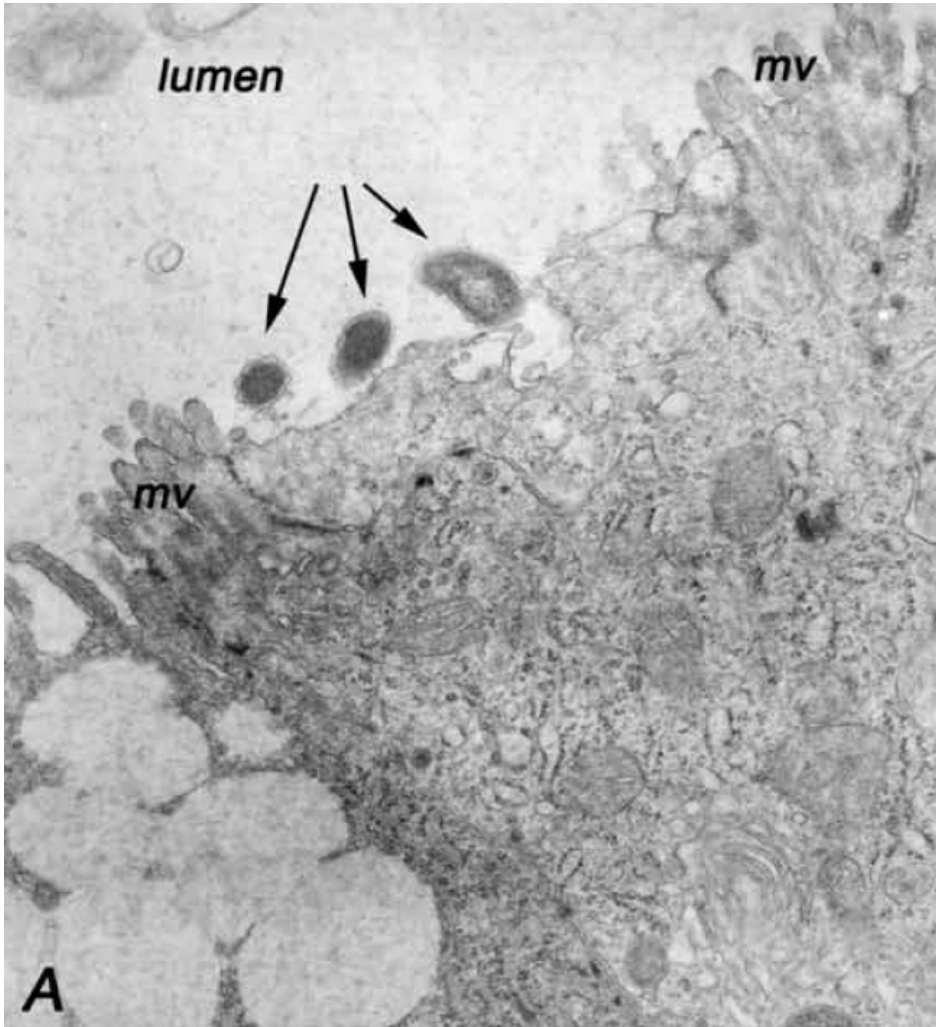
Immune Response to and Histopathology of *Campylobacter jejuni* Infection in Ferrets (*Mustela putorius furo*)

Kevin W Nemelka,[1,*] Ammon W Brown,[2] Shannon M Wallace,[2] Erika Jones,[3] Ludmila V Asher,[2] Dawn Pattarini,[3] Lisa Applebee,[3] Theron C Gilliland Jr,[3] Patricia Guerry,[3] and Shahida Baqar[3]



IHC

TEM



Cloning of the Full-Length cDNA of Porcine Antithrombin III and Comparison with its Human Homolog

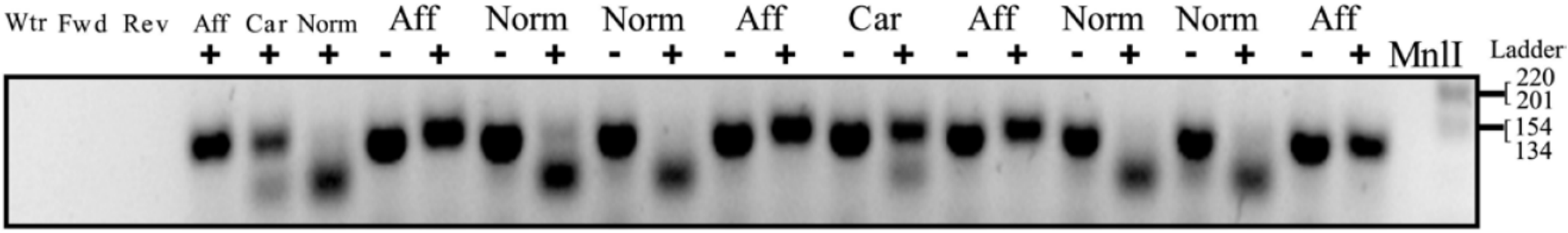
Younan Chen,[1] Weidong Tan,[1] Shengfang Qin,[1] Jie Zhang,[1] Hong Bu,[2] Youping Li,[1] Yanrong Lu,[1,*] and Jingqiu Cheng[1,*]

- The liver tissue taken from a C57BL/6 mouse donor and transplanted into a BALB/c recipient is best described as what?
    1. Xenograft
    2. Allograft
    3. Syngeneic allograft
    4. Autograft
    5. Isograft

- The liver tissue taken from a C57BL/6 mouse donor and transplanted into a BALB/c recipient is best described as what?
    1. Xenograft (between different species)
    2. **Allograft (between same species)**
    3. Syngeneic allograft (between same genotype)
    4. Autograft (self)
    5. Isograft (same as #3)

Inadvertent Propagation of Factor VII Deficiency in a Canine Mucopolysaccharidosis Type I Research Breeding Colony

Lucas P Carlstrom,[1] Jackie K Jens,[1] Marley E Dobyns,[1] Merry Passage,[2] Patricia I Dickson,[2] and N Matthew Ellinwood[1,*]



- What do you know about DNA endonuclease digestion products, agarose gels, and blotting?

Prevalence of Viremia and Oral Shedding of Rhesus Rhadinovirus and Retroperitoneal Fibromatosis Herpesvirus in Large Age-Structured Breeding Groups of Rhesus Macaques (*Macaca mulatta*)

Jessica A White,[1,*] Patricia A Todd,[1] JoAnn L Yee,[1] Alexis Kalman-Bowlus,[1] Kelsey S Rodgers,[4] Xiaowei Yang,[2] Scott W Wong,[4] Peter Barry,[1,3] and Nicholas W Lerche[1]

Fun with Matching

1. *Cercopithecine herpesvirus 1*
2. *Cytomegalovirus*
3. *Rhadinovirus*
4. Epstein-Barr virus
5. Measles
6. *Yaba virus*
7. Simian hemorrhagic fever virus

1. Alphaherpesvirinae
2. Betaherpesvirinae
3. Gammaherpesvirinae
4. Arteriviridae
5. Poxviridae
6. Paramyxoviridae

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2. *Cytomegalovirus*
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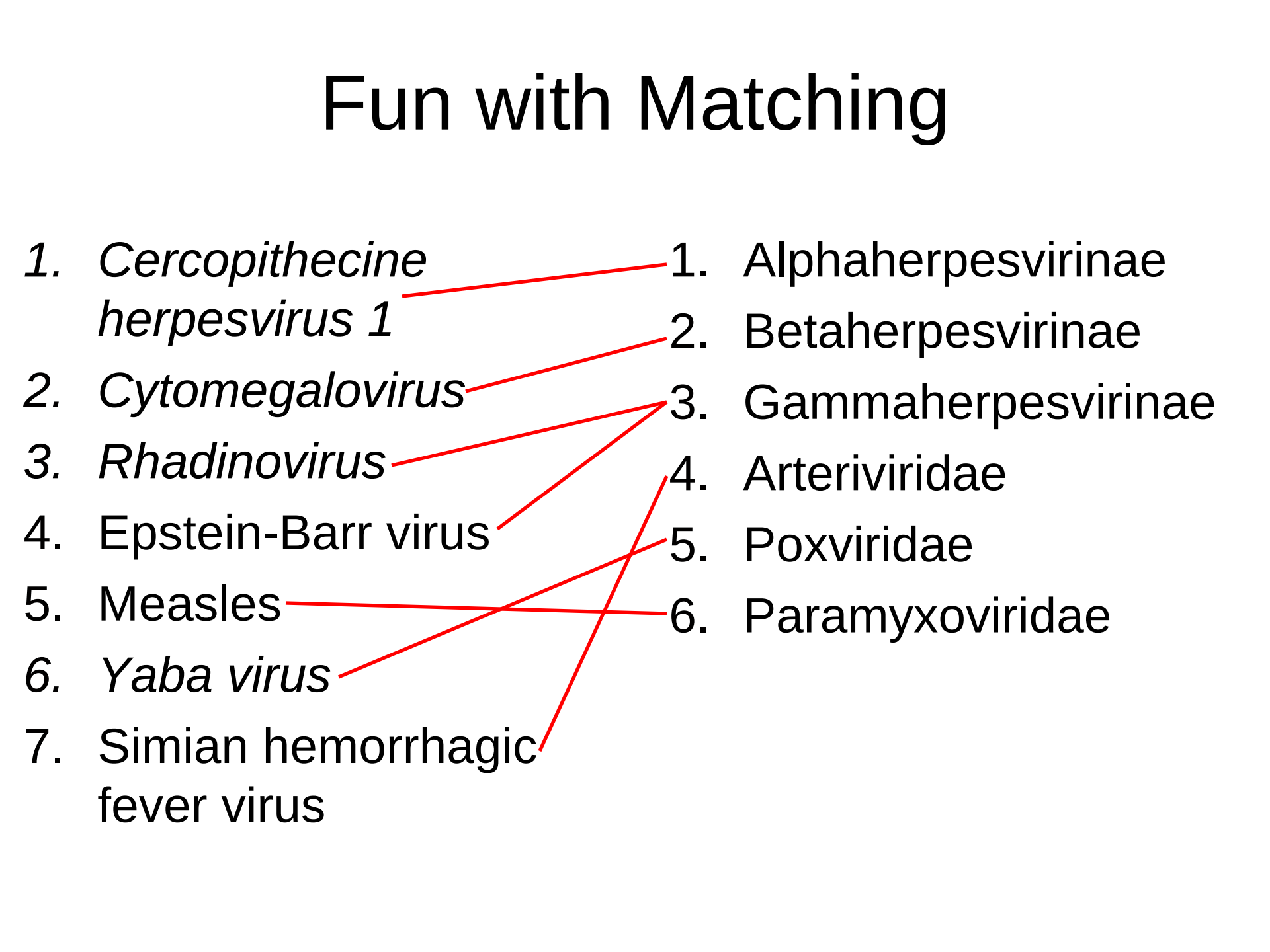

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October, 2009

Estrogen-Responsive Transient Expression Assay Using a Brain Aromatase-Based Reporter Gene in Zebrafish (*Danio rerio*)

Dong-Jae Kim,[1] Seung-Hyeok Seok,[1] Min-Won Baek,[1] Hui-Young Lee,[1] Yi-Rang Na,[1] Sung-Hoon Park,[1] Hyun-Kyoung Lee,[1] Noton Kumar Dutta,[1] Koichi Kawakami,[2] and Jae-Hak Park[1,*]

- What is the primary role of the biological filter in an aquatic housing system?
    1. To remove chlorine
    2. To remove chloramine
    3. To remove carbon dioxide
    4. To remove calcium
    5. To remove ammonia

- What is the primary role of the biological filter in an aquatic housing system?
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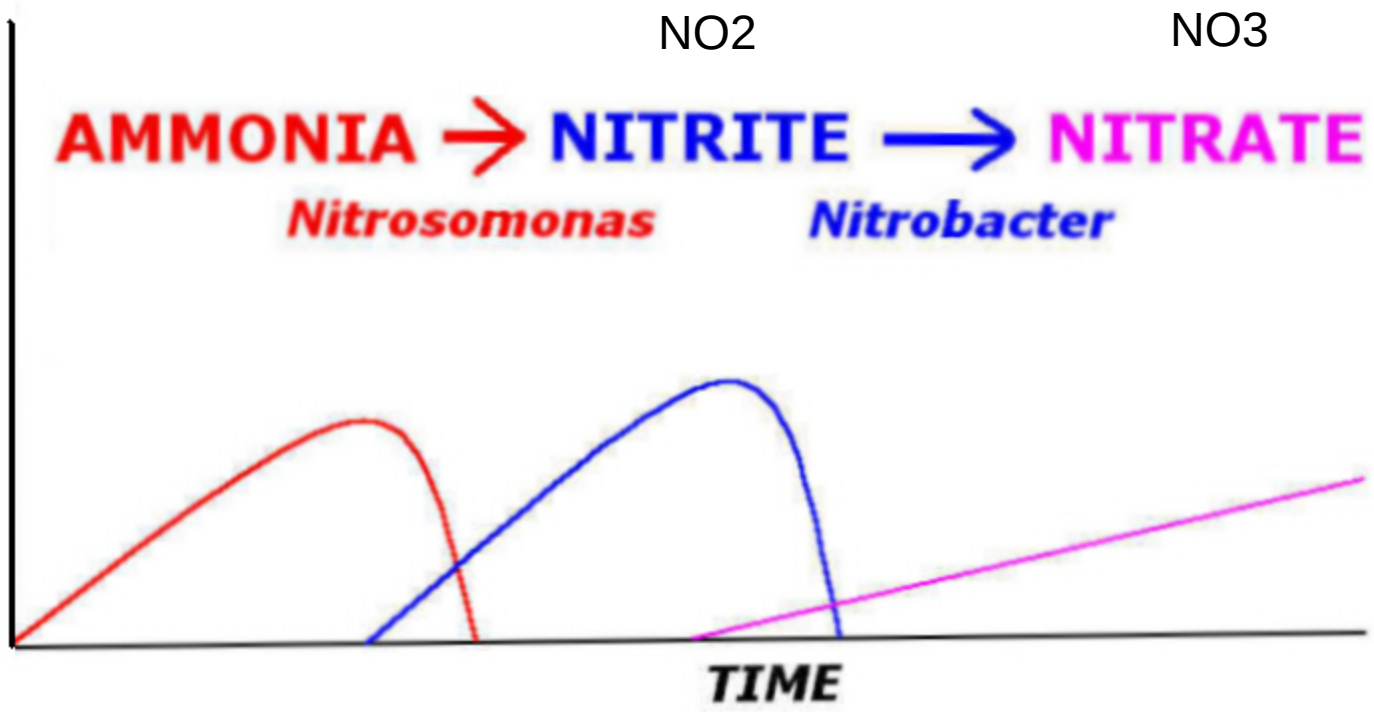
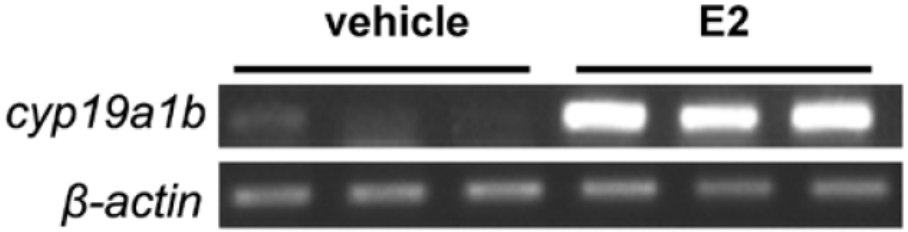
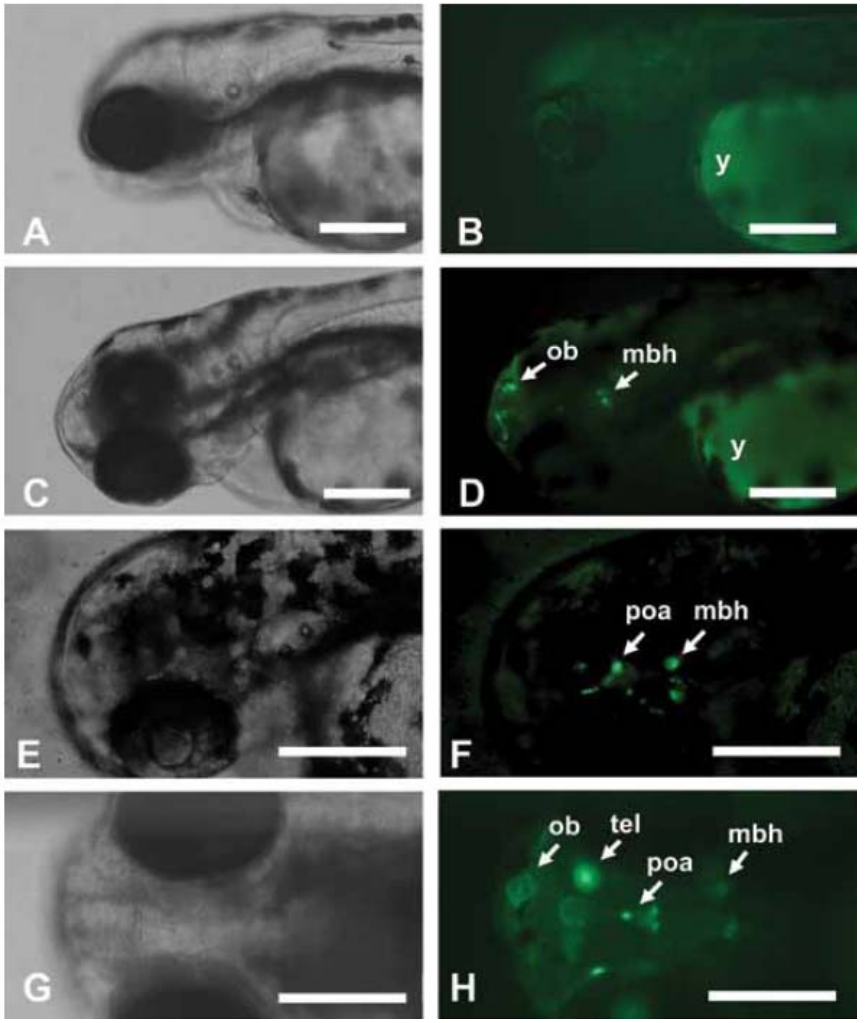
  5. **To remove ammonia**


NO2
NO3
AMMONIA
NITRITE
NITRATE
Nitrosomonas
Nitrobacter
TIME

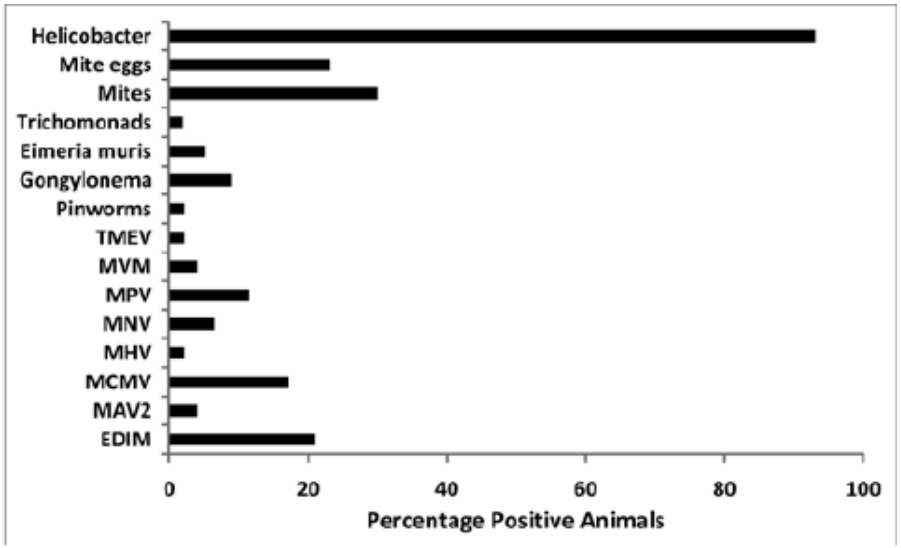
Take Note…

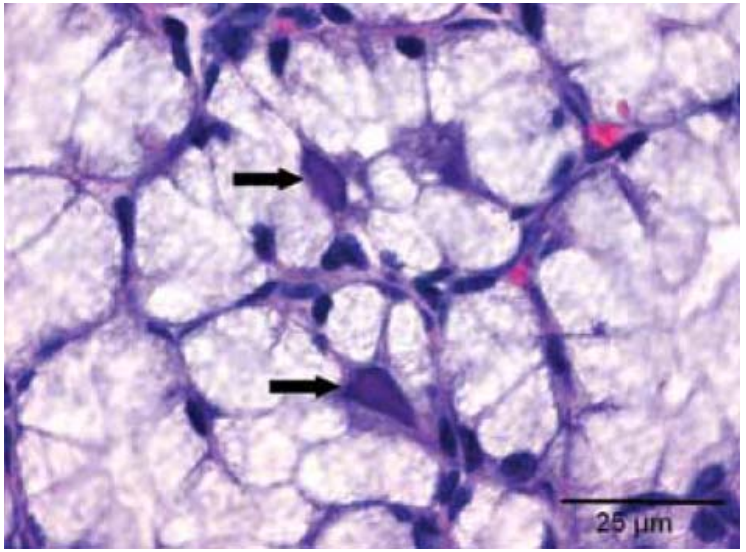

vehicle
E2
cyp19a1b
β-actin

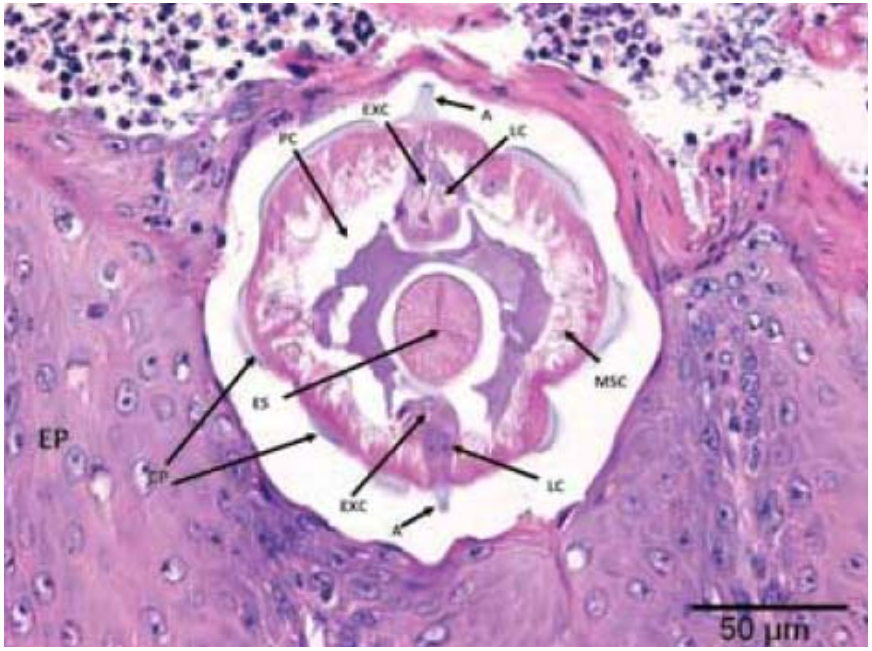

A
B
y
C
D
ob
mbh
y
E
F
poa
mbh
G
H
ob
tel
poa
mbh

Infectious Diseases in Wild Mice (*Mus musculus*) Collected on and around the University of Pennsylvania (Philadelphia) Campus

Sharon E Parker,[1] Sarah Malone,[1] Ralph M Bunte,[2] and Abigail L Smith[1,2,*]


Helicobacter
Mite eggs
Mites
Trichomonads
Eimeria muris
Gongylonema
Pinworms
TMEV
MVM
MPV
MNV
MHV
MCMV
MAV2
EDIM
0
20
40
60
80
100
Percentage Positive Animals

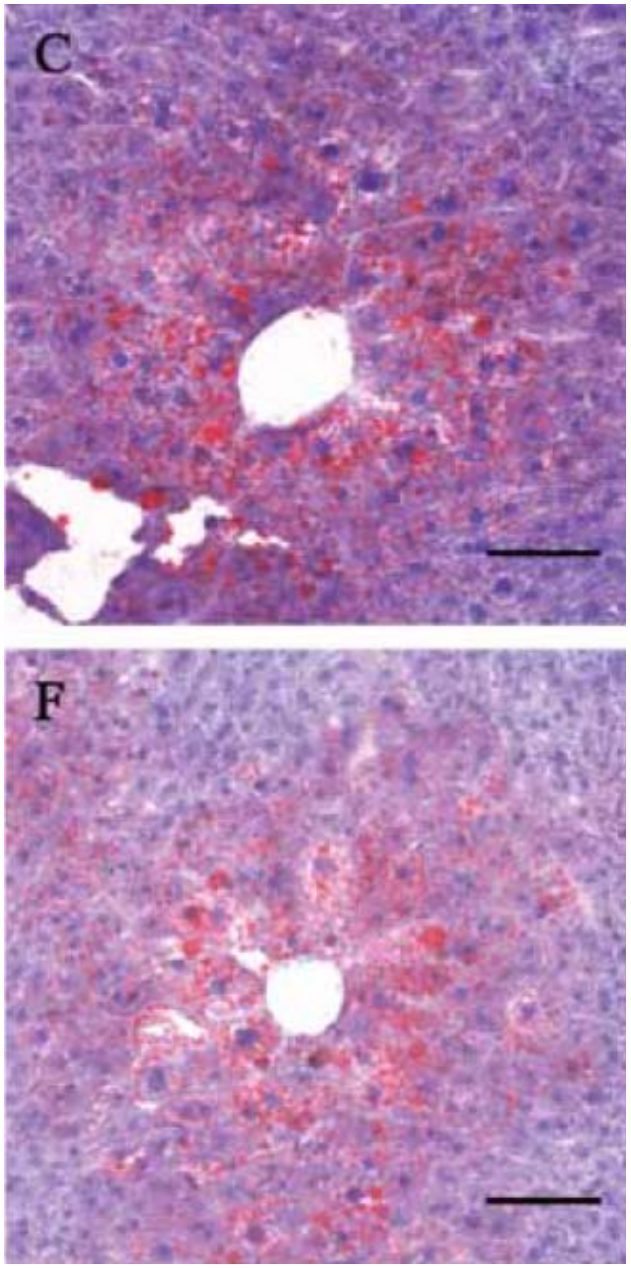

25 µm


EXC
A
LC
PC
ES
MSC
EP
EP
LC
EXC
A
50 µm

Adiposity-Related Biochemical Phenotype in Senescence-Accelerated Mouse Prone 6 (SAMP6)

Kimie Niimi,[1,2] Eiki Takahashi,[2,*] and Chitoshi Itakura[2]

- Oil Red O stain



- As Tribromoethanol degrades over time, what change can be observed?
  1. An increase in osmolality
  2. A decrease in osmolality
  3. An increase in pH
  4. A decrease in pH
  5. A decrease in turbidity

- As Tribromoethanol degrades over time, what change can be observed?
  1. An increase in osmolality
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  3. An increase in pH
  4. **A decrease in pH**
  5. A decrease in turbidity

Reproductive Experience and the Response of Female Sprague–Dawley Rats to Fear and Stress

Brandi N Rima,[1] Massimo Bardi,[2,*] Julia M Friedenberg,[3] Lillian M Christon,[4] Kate E Karelina,[5] Kelly G Lambert,[6] and Craig H Kinsley[3]

- What is the primary mediator of glucocorticoid activity in rodents?
    1. Hydrocortisone
    2. Cortisol
    3. Corticosterone
    4. Aldosterone
    5. Prednisolone

- What is the primary mediator of glucocorticoid activity in rodents?
  1. Hydrocortisone
  2. Cortisol
  3. **Corticosterone**
  4. Aldosterone
  5. Prednisolone

Effects of Timing of Dexamethasone Treatment on the Outcome of Collagenase-Induced Intracerebral Hematoma in Rats

Claudine Savard,[2] Pablo Patricio Lema,[1] Pierre Hélie,[2] and Pascal Vachon[1,*]

- The apparatus shown is used to measure what parameter?
    1. Strength
    2. Pain perception
    3. Coordination
    4. Vision
    5. Memory

- The apparatus shown is used to measure what parameter?
    1. Strength
    2. Pain perception
    3. **Coordination**
    4. Vision
    5. Memory

Insulin Resistance in Insulin-Resistant and Diabetic Hamsters (*Mesocricetus auratus*) Is Associated with Abnormal Hepatic Expression of Genes Involved in Lipid and Glucose Metabolism

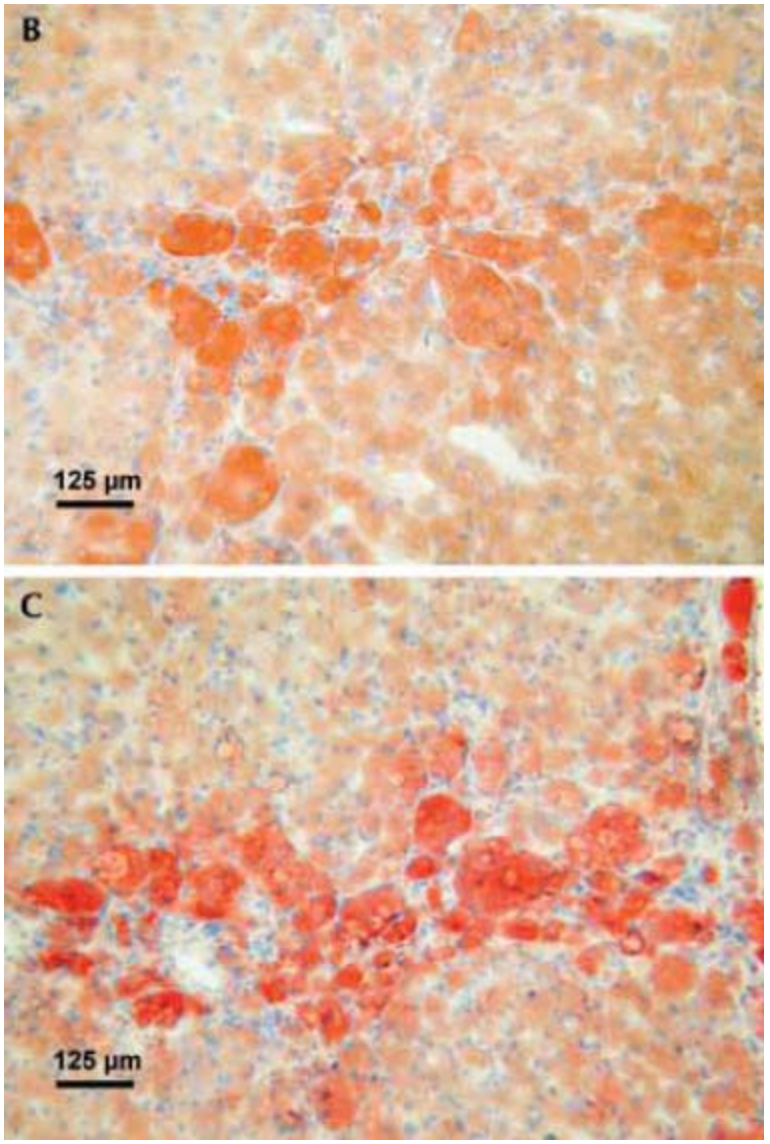
Guosheng Li, Xuhan Liu, Hua Zhu, Lan Huang, Yali Liu, Chunmei Ma, and Chuan Qin*

- Which of the following is a model for Type II diabetes mellitus?
  1. Alloxan-induced diabetes
  2. Streptozoticin-induced diabetes
  3. Mice with a mutation in the *Lepr* gene
  4. Mice with a mutation in the *Lep* gene
  5. The NOD mouse

- Which of the following is a model for Type II diabetes mellitus?
  1. Alloxan-induced diabetes (Type I)
  2. Streptozoticin-induced diabetes (Type I)
  3. **Mice with a mutation in the *Lepr* gene**
  4. **Mice with a mutation in the *Lep* gene**
  5. The NOD mouse (Type I)

NOTE!!! "STZ given to induce Type 2 diabetes.." stated on page 450

- Oil Red O



Fun With Hamster Taxonomy

- Syrian Hamster
- Chinese Hamster
- Armenian Hamster
- European Hamster
- Djungarian Hamster

Fun With Hamster Taxonomy

- Syrian Hamster
  - *Mesocricetus auratus*
- Chinese Hamster
  - *Cricetulus griseus*
- Armenian Hamster
  - *Cricetulus mirgratorius*
- European Hamster
  - *Cricetus cricetus*
- Djungarian Hamster
  - *Phodopus sungorus*

MRI Features in a Canine Model of Ischemic Stroke: Correlation between Lesion Volume and Neurobehavioral Status during the Subacute Stage

Byeong-Teck Kang,[1] Dong-Pyo Jang,[2] Su-Hyun Gu,[3] Jong-Hwan Lee,[4] Dong-In Jung,[5] Chae-Young Lim,[3] Ha-Jung Kim,[3] Young-Bo Kim,[2] Hyung-Joong Kim,[6] Eung-Je Woo,[6] Zang-Hee Cho,[2,*] and Hee-Myung Park[3,*]

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VS

Three-Dimensional Time-of-Flight Magnetic Resonance Angiography of Intracranial Vessels in a Canine Model of Ischemic Stroke with Permanent Occlusion of the Middle Cerebral Artery

Byeong-Teck Kang,[1] Dong-Pyo Jang,[3] Su-Hyun Gu,[1] Young-Bo Kim,[3] Chae-Young Lim,[1] Jong-Hwan Lee,[2] Eung-Je Woo,[4] Zang-Hee Cho,[3,*] and Hee-Myung Park[1,*]

The Anatomy of the Glenoid Labrum: A Comparison between Human and Dog

Martin Sager,[1,*] Monika Herten,[2] Stefanie Ruchay,[2] Josef Assheuer,[3] Martin Kramer,[4] and Marcus Jäger[2]

K-9 Exercise Requirement?

- Housed singly?
- Housed in groups?

K-9 Exercise Requirement?

- Housed singly?
  - No specific requirement IF 2x required cage space provided
  - If less than 2x, exercise program per the AV
- Housed in groups?
  - No specific requirement IF 100% of space required for each individual provided

Related Items

- Dog housed with no “sensory contact” with another dog?

- Exercise exemption?

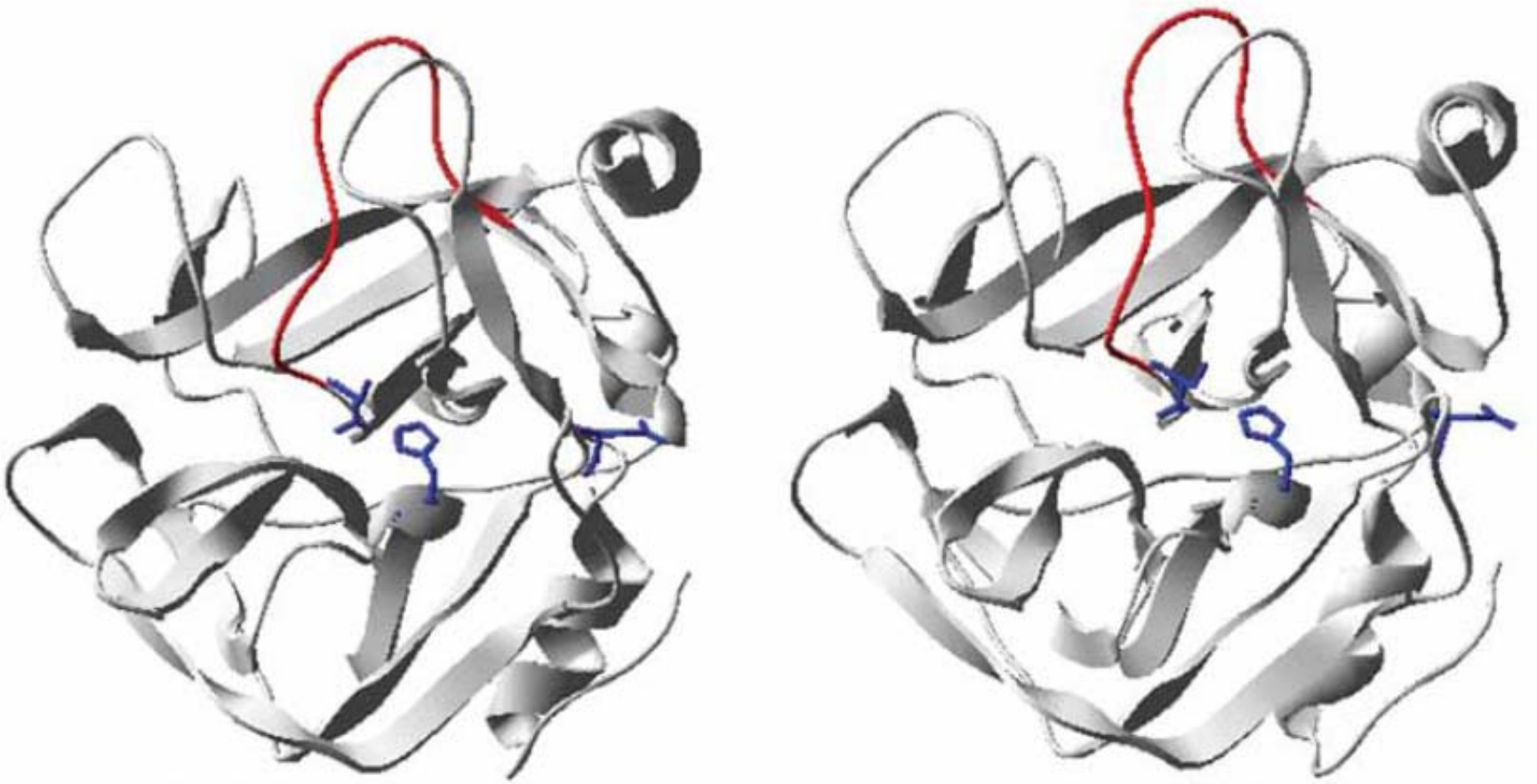
Related Items

- Dog housed with no “sensory contact” with another dog?
  - Must have human contact daily

- Exercise exemption?
  - Per AV’s discretion and MUST be reviewed every 30 days
  - Per IACUC protocol, and MUST be reviewed at least annually

Cloning and Comparison of Factor X from Rhesus Monkey (*Macaca mulatta*)

Younan Chen,[1] Shengfang Qin,[1] Weidong Tan,[1] Yanrong Lu,[1] Jie Zhang,[1] Hongxia Li,[3] Hong Bu,[2] and Jingqiu Cheng[1,*]



A Rhesus monkey

B Human

Simian Varicella Virus in Pigtailed Macaques (*Macaca nemestrina*): Clinical, Pathologic, and Virologic Features

- What do you know about Simian Varicella Virus?
  - Family?
  - Subfamily?
  - Species?
  - Characterized strains?
  - Similar to what human virus?

- What do you know about Simian Varicella Virus?
  - Family?
    - Herpesviridae
  - Subfamily?
  - Species?
  - Characterized strains?
  - Similar to what human virus?

- What do you know about Simian Varicella Virus?
  - Family?
    - Herpesviridae
  - Subfamily?
    - Alphaherpesvirinae
  - Species?
  - Characterized strains?
  - Similar to what human virus?

- What do you know about Simian Varicella Virus?
  - Family?
    - Herpesviridae
  - Subfamily?
    - Alphaherpesvirinae
  - Species?
    - *Cercophithecine herpesvirus 9*
  - Characterized strains?
  - Similar to what human virus?

- What do you know about Simian Varicella Virus?
  - Family?
    - Herpesviridae
  - Subfamily?
    - Alphaherpesvirinae
  - Species?
    - *Cercophithecine herpesvirus 9*
  - Characterized strains?
    - Delta, Medical lake, Patas, Liverpool
  - Similar to what human virus?

- What do you know about Simian Varicella Virus?
  - Family?
    - Herpesviridae
  - Subfamily?
    - Alphaherpesvirinae
  - Species?
    - *Cercophithecine herpesvirus 9*
  - Characterized strains?
    - Delta, Medical lake, Patas, Liverpool
  - Similar to what human virus?
    - Varicella-zoster (chicken pox)

Take Note….

Some Differentials

- Monkey pox: Noteworthy event in 2003?
- Measles: Two other clinical manifestations?
- B-virus: The ‘new’ name?

Some Differentials

- Monkey pox: Noteworthy event in 2003?
  - Shipment of rodents from Ghana source of Midwestern ‘outbreak’
- Measles: Two other clinical manifestations?
  - Pneumonia and Koplik spots
  - GI symptoms in NWPs
  - Syncitia formation
- B-virus: The ‘new’ name?
  - *Macacine herpesvirus 1*

Volume 59 (6)
December, 2009

Acute Phase Response in Animals: A Review

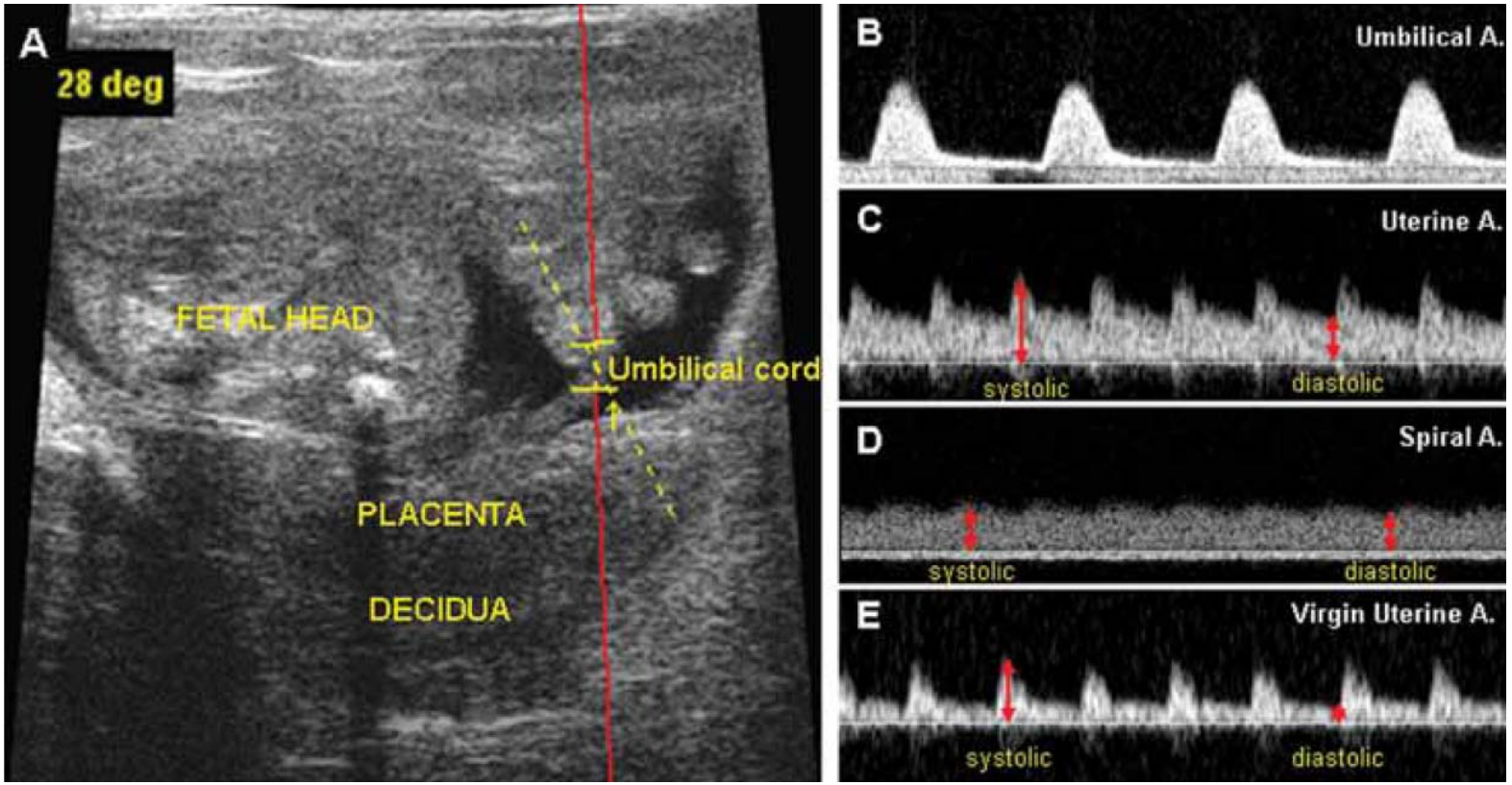
Carolyn Cray,[1,*] Julia Zaias,[1,2] and Norman H Altman[1]

Not Sure On This One….

- Acute phase proteins
  - Serum amyloid A and P, C-reactive protein, fibrinogen, ceruloplasmin
- APR ‘inducers’
  - Neoplasia, infection, inflammation, necrosis, autoimmune, stress
- Use of APR in laboratory animal medicine
  - Refinement tool?

Using Ultrasonography to Define Fetal–Maternal Relationships: Moving from Humans to Mice

Jianhong Zhang and B Anne Croy*

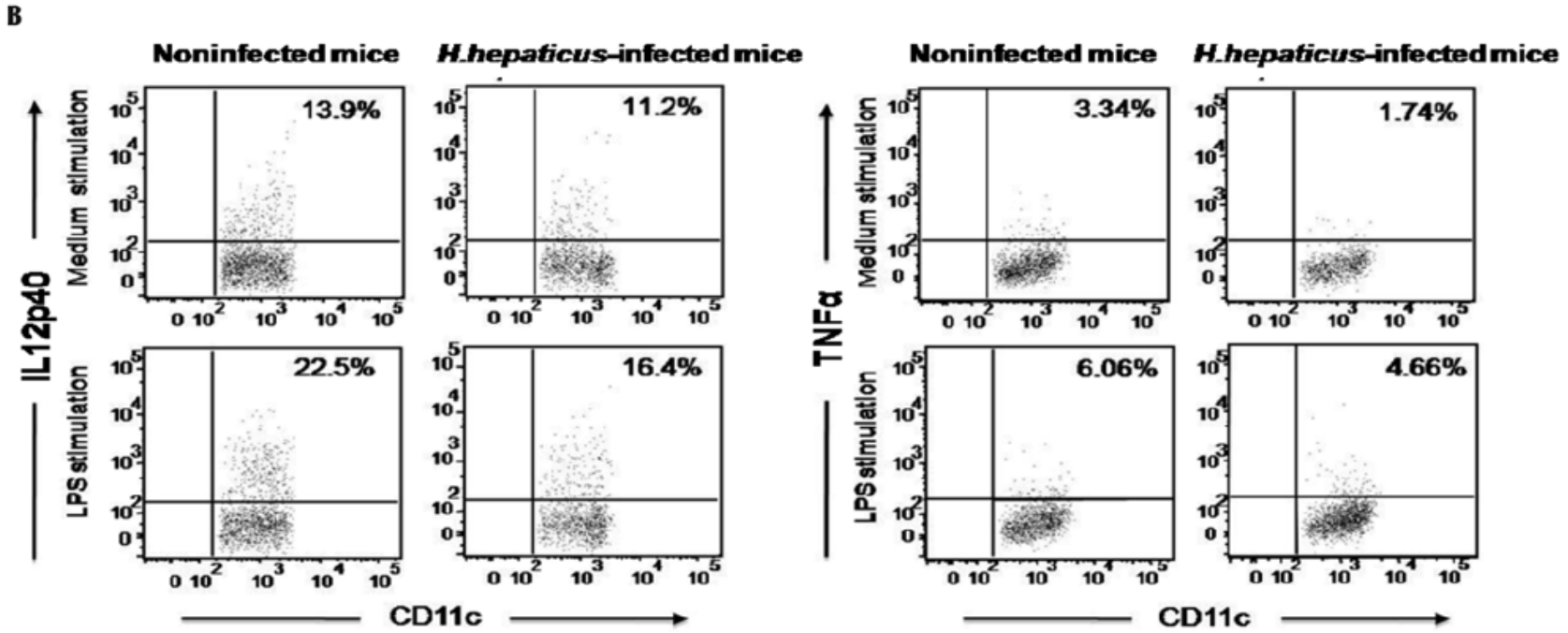


- B-mode image
- Doppler waveforms

The Effect of *Helicobacter hepaticus* Infection on Immune Responses Specific to Herpes Simplex Virus Type 1 and Characteristics of Dendritic Cells

Jatinder Gulani,[1] Christopher C Norbury,[2] Robert H Bonneau,[2] and Catherine S Beckwith[1,2,*]

FACS


B
Noninfected mice
H.hepaticus-infected mice
Noninfected mice
H.hepaticus-infected mice
IL12p40
TNFα
Medium stimulation
LPS stimulation
13.9%
11.2%
22.5%
16.4%
3.34%
1.74%
6.06%
4.66%
CD11c
CD11c

Mutational Insertion of a *ROSA26–EGFP* Transgene Leads to Defects in Spermiogenesis and Male Infertility in Mice

Eric M Walters, Beth A Bauer, Craig L Franklin, Tim J Evans, Elizabeth C Bryda, Lela K Riley, and John K Critser*

Let’s Talk Transgenics

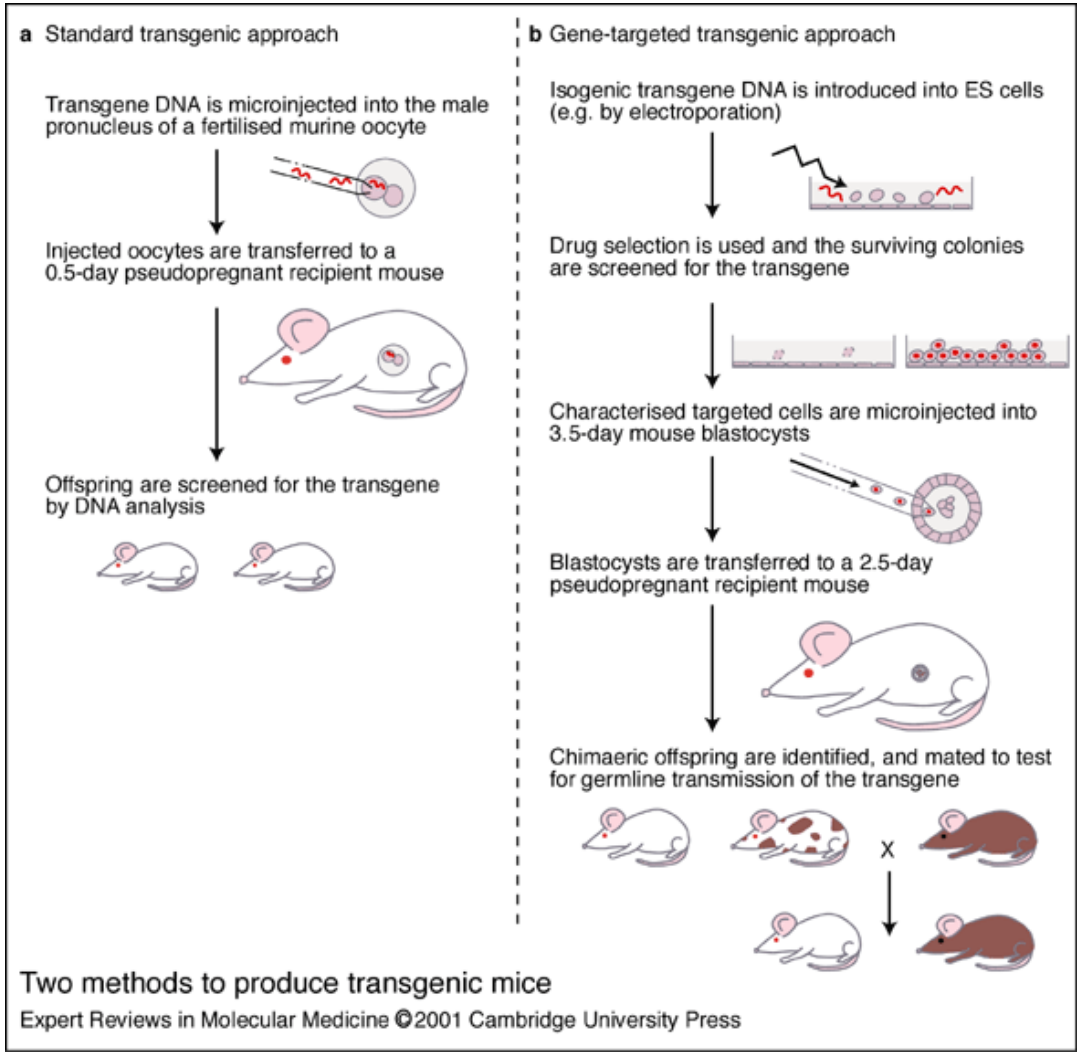
- FVB/NTac-*Tg(Gt(ROSA)26Sor-EGFP)130910Eps*

Let's Talk Transgenics

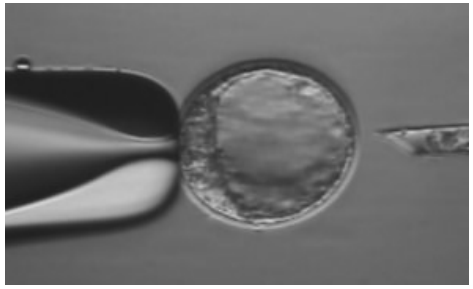
- FVB/NTac-*Tg(Gt(ROSA)26Sor-EGFP)130910Eps*
  - Random or targeted insertion of DNA?
  - Where is the DNA injected?
  - What is all that 'stuff' inside the parenthesis?
  - What does "130910" denote?
  - What does "Eps" denote?
  - Why FVB strain?
  - Was a chimera involved with producing this strain?

Let's Talk Transgenics

- FVB/NTac-*Tg(Gt(ROSA)26Sor-EGFP)130910Eps*
  - Random or targeted insertion of DNA?
    - Random. Targeted denoted "tm"
  - Where is the DNA injected?
    - Into male pronucleus
  - What is all that 'stuff' inside the parenthesis?
    - Official designation of the transgene
  - What does "130910" denote?
    - Founder designation
  - What does "Eps" denote?
    - Official lab code
  - Why FVB strain?
    - Large male pronucleus
  - Was a chimera involved with producing this strain?
    - No. Chimera the resulut of targeted mutation process.



Two methods to produce transgenic mice



A Mouse Surgical Model for Metastatic Ovarian Granulosa Cell Tumor

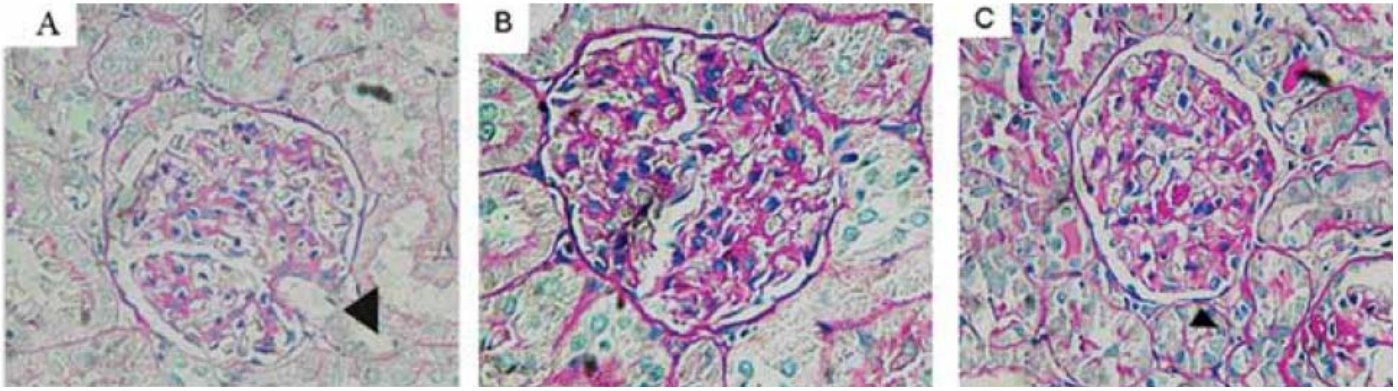
Marie-Eve Nadeau,[1,*] M Johanna Kaartinen,[1] Marie-Noëlle Laguë,[2] Marilène Paquet,[3] Louis M Huneault,[1] and Derek Boerboom[2]

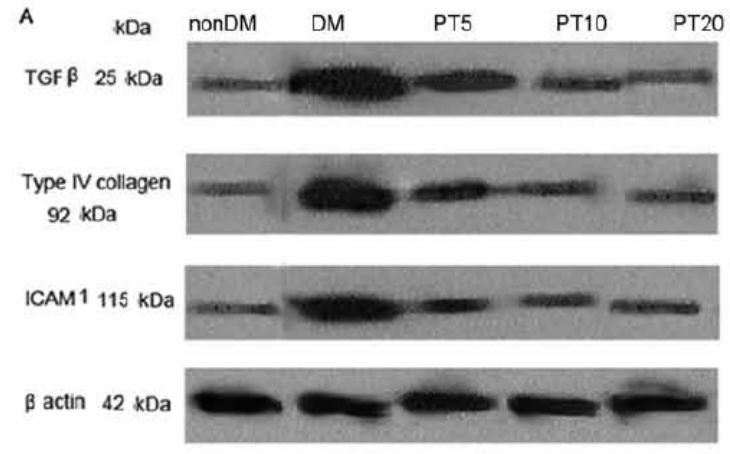
- What schedules are ketamine and morphine?
- What is the mechanism of medetomidine?
- What is the reversal agent for medetomidine?
- What is the NIOSH recommended exposure limit for halogenated anesthetic agents?

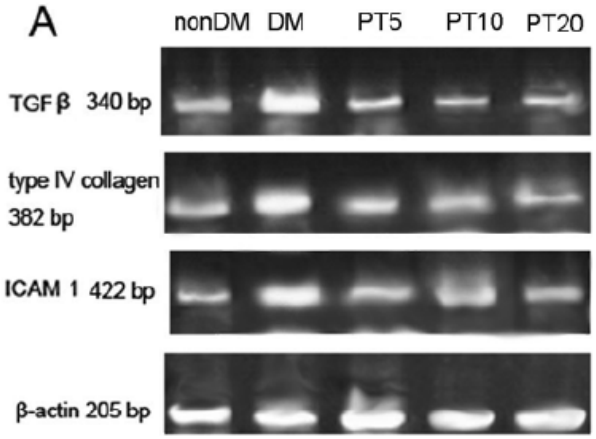
- What schedules are ketamine and morphine?
  - III and II respectively
- What is the mechanism of medetomidine?
  - Alpha adrenergic receptor agonist
- What is the reversal agent for medetomidine?
  - Atipamezole
- What is the NIOSH recommended exposure limit for halogenated anesthetic agents?
  - 2ppm (does NOT actually apply to isoflurane)

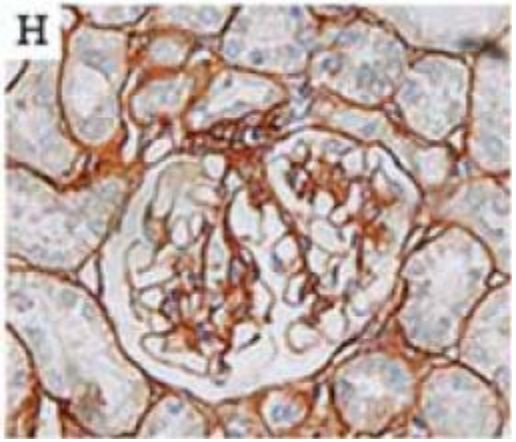
Paeoniflorin Prevents Diabetic Nephropathy in Rats

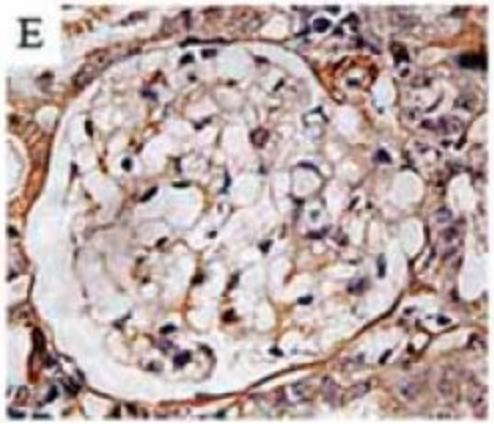
Jianfang Fu, Yuan Li, Li Wang, Bin Gao, Nanyan Zhang, and Qiuhe Ji*


A
B
C

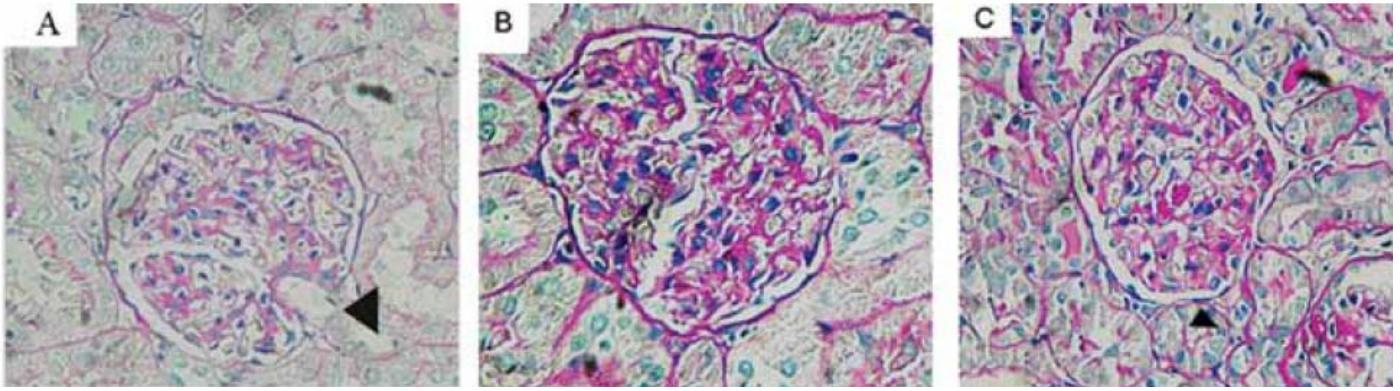

A
kDa
nonDM
DM
PT5
PT10
PT20
TGF β 25 kDa
Type IV collagen
92 kDa
ICAM 1 115 kDa
β actin 42 kDa


A
nonDM
DM
PT5
PT10
PT20
TGF β 340 bp
type IV collagen
382 bp
ICAM 1 422 bp
β-actin 205 bp

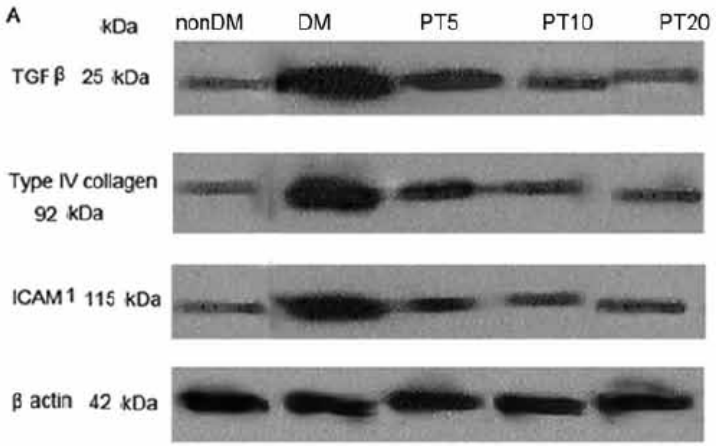

H

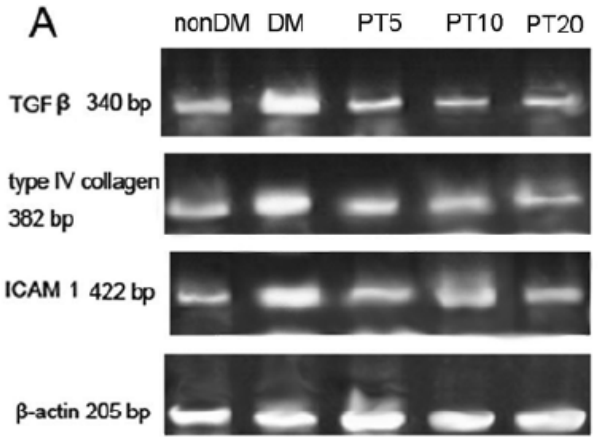

E

PAS



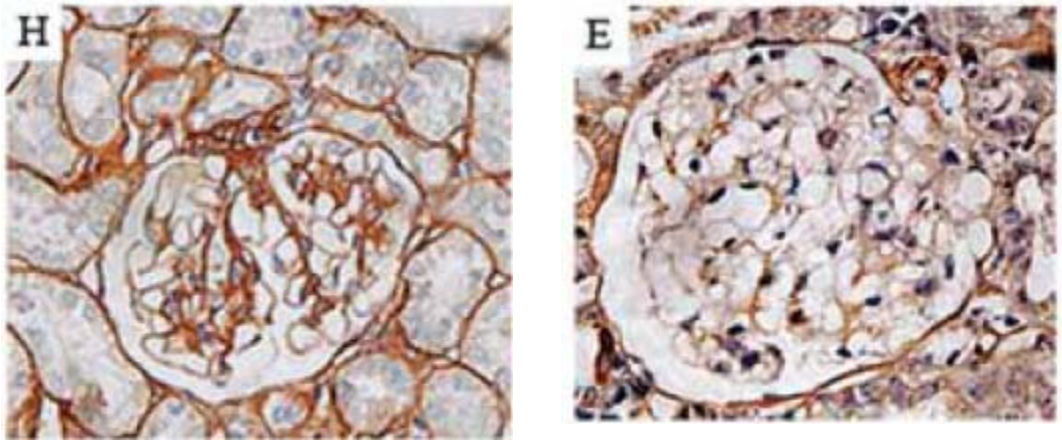
WB





RT PCR

IHC



Ribonucleotide Reductase Inhibitors Reduce Atherosclerosis in a Double-Injury Rabbit Model

Laura D Gallaugher,[1,*] Jon C Henry,[1] Patrick N Kearns,[2] Howard L Elford,[3] Valerie K Bergdall,[1] and Arturo J Cardounel[2,*]

Classifying Diets:

- Ingredients
  - Natural-ingredient
  - Purified
  - Chemically-defined
- Labeling/Consistency
  - Open formula
  - Closed formula
  - Fixed formula
- Physical form
  - Pelleted
  - Extruded
  - Meal
  - Crumbled
  - Liquid
- Sterilized
  - Autoclaved
  - Irradiated
- Certified diets

Open, Closed, Fixed

- Open formula
  - Each ingredient and concentration is openly declared
- Closed formula
  - Exact formulation is not disclosed; only ingredients are disclosed
- Fixed formula
  - Each ingredient always used in fixed amount

2014S

Teklad Global 14% Protein Rodent Maintenance Diet (Sterilizable)

2014S

Product Description—**Teklad Global 14% Protein Rodent Maintenance Diet (Sterilizable)** is designed and manufactured with the same high quality ingredients in both the United States and throughout Europe. 2014S is a **fixed formula** diet containing 14% protein and 3.5% fat. Scientific publications report that low fat, low protein diets promote longevity and normal body weight in rodents. 2014S does not contain alfalfa or soybean meal, thus minimizing the occurrence of natural phytoestrogens. Absence of animal protein and fish meal eliminates the presence of nitrosamines. 2014S is a balanced diet supplemented with additional vitamins to ensure nutritional adequacy after autoclaving. **All Harlan Teklad Global Diets® are available certified.**

Ingredients—Wheat middlings, ground wheat, ground corn, corn gluten meal, calcium carbonate, soybean oil, dicalcium phosphate, iodized salt, L-lysine, DL-methionine, choline chloride, thiamine mononitrate, biotin, niacin, vitamin A acetate, pyridoxine hydrochloride, vitamin D_3 supplement, folic acid, menadione sodium bisulfite complex (source of vitamin K activity), calcium pantothenate, vitamin E supplement, vitamin B_{12} supplement, riboflavin, ferrous sulfate, magnesium oxide, manganous oxide, zinc oxide, copper sulfate, calcium iodate, cobalt carbonate, chromium potassium sulfate.

Natural vs. Purified vs. Chemically Defined

- Natural Ingredient
  - Most common diet
  - Composed of cereal grains with some refined materials (e.g. bone meal)
  - Disadvantages
    - Variability in nutrient composition from batch to batch
    - Contaminants, estrogenic compounds
    - Reduced nutrient bioavailability

Natural vs. Purified vs. Chemically Defined

- Purified
  - Formulated from set of refined, invariant ingredients such as casein
    - AIN and NIH diets
      - AIN-93(G or M) most commonly used presently
- Chemically defined
  - Formulated with analytical-grade components
    - Amino acids, triglycerides etc.
  - Not very commonly used

Disadvantage of both is diminished shelf life

Atherogenic Diets

- Western diet and Paigen diet
  - High fat to promote atherosclerosis
  - Increased cholesterol plus sodium cholate in Paigen diet

Selected Nutrient Information [1]		
	% by weight	% kcal from
Protein	17.3	15.2
Carbohydrate	48.5	42.7
Fat	21.2	42.0

Certified Diets

- Certified to be free of contaminants
- Mandatory for GLP studies

Contaminant	Maximum Acceptable Limit			
	Rodent Diets	Guinea Pig/ Rabbit Diets	Lab Dog Diets	Primate Diets
Arsenic	1.00	1.00	1.00	1.00
Cadmium	0.50	0.50	0.50	0.50
Lead	1.50	1.50	1.50	1.50
Mercury	0.20	0.20	0.20	0.20
Selenium	0.50	0.50	0.50	0.50
Aflatoxin*	5.00	5.00	5.00	5.00
Aldrin	0.03	0.03	0.03	0.03
Dieldrin	0.03	0.03	0.03	0.03
Endrin	0.03	0.03	0.03	0.03
Heptachlor	0.03	0.03	0.03	0.03
Lindane	0.05	0.05	0.05	0.05
Chlordane	0.05	0.05	0.05	0.05
DDT-Related Substances	0.15	0.15	0.15	0.15
PCB	0.15	0.15	0.15	0.15
Heptachlor Epoxide	0.03	0.03	0.03	0.03
Toxaphene	0.15	0.15	0.15	0.15
a-BHC	0.05	0.05	0.05	0.05
b-BHC	0.05	0.05	0.05	0.05
d-BHC	0.05	0.05	0.05	0.05
Hexachlorobenzene	0.03	0.03	0.03	0.03
Mirex	0.02	0.02	0.02	0.02
Methoxchlor	0.50	0.50	0.50	0.50
Thimet	0.50	0.50	0.50	0.50
Diazinon	0.50	0.50	0.50	0.50
Disulfaton	0.50	0.50	0.50	0.50
Methyl Parathion	0.50	0.50	0.50	0.50
Malathion	0.50	0.50	0.50	0.50
Parathion	0.50	0.50	0.50	0.50
Thiodan	0.50	0.50	0.50	0.50
Ethion	0.50	0.50	0.50	0.50
Trithion	0.50	0.50	0.50	0.50

(Contaminents listed in parts per million) *(*Listed in parts per billion)*

- What does this signify?

- Name that diet:

Formula	g/Kg
Casein	207.0
DL-Methionine	3.0
Fructose	600.0
Lard	50.0
Cellulose	79.81
Mineral Mix, Rogers-Harper (170760)	50.0
Zinc Carbonate	0.04
Vitamin Mix, Teklad (40060)	10.0
Green Food Color	0.15

- What does this signify?
  - Radura

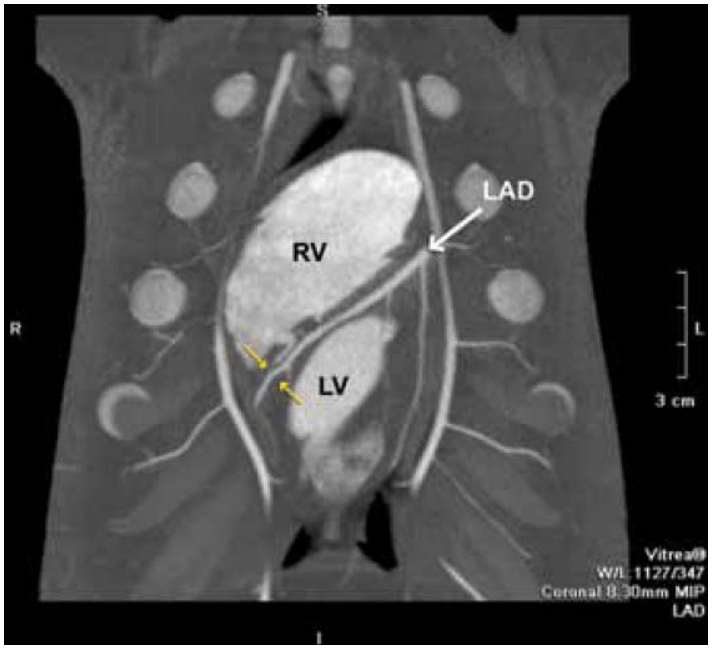
- Name that diet: Purified

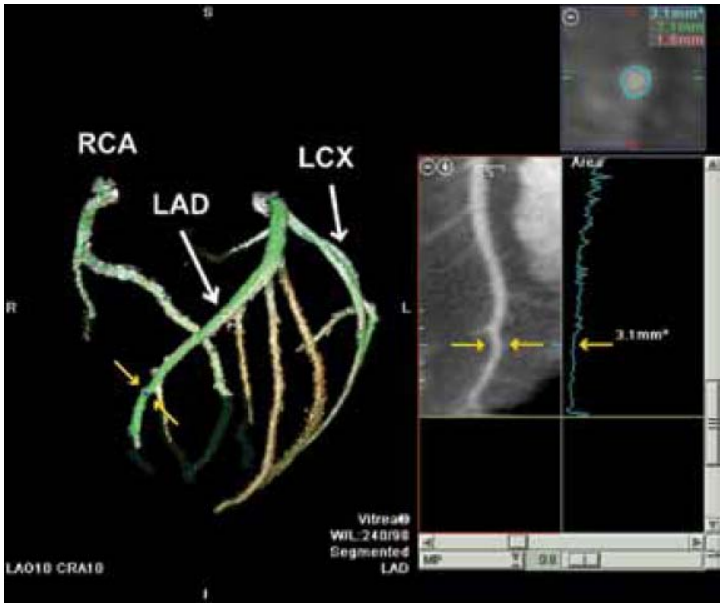
Formula	g/Kg
Casein	207.0
DL-Methionine	3.0
Fructose	600.0
Lard	50.0
Cellulose	79.81
Mineral Mix, Rogers-Harper (170760)	50.0
Zinc Carbonate	0.04
Vitamin Mix, Teklad (40060)	10.0
Green Food Color	0.15

Using Multidetector Computed Tomography in a Swine Model to Assess the Effects of Sublingual Nitroglycerin and Intravenous Adenosine on Epicardial Coronary Arteries

Wesley A Clarkson,[1] Carlos Santiago Restrepo,[2] Terry D Bauch,[2] and Bernard J Rubal[1,*]

- Just remember what is unique about swine heart vasculature!





Comparative Analyses of Single-Nucleotide Polymorphisms in the *TNF* Promoter Region Provide Further Validation for the Vervet Monkey Model of Obesity

Stanton B Gray,[1,2,*] Timothy D Howard,[2] Carl D Langefeld,[3] Gregory A Hawkins,[2] Abdoulaye F Diallo,[2] and Janice D Wagner[1]

Remember Your Type II Diabetes Tidbits

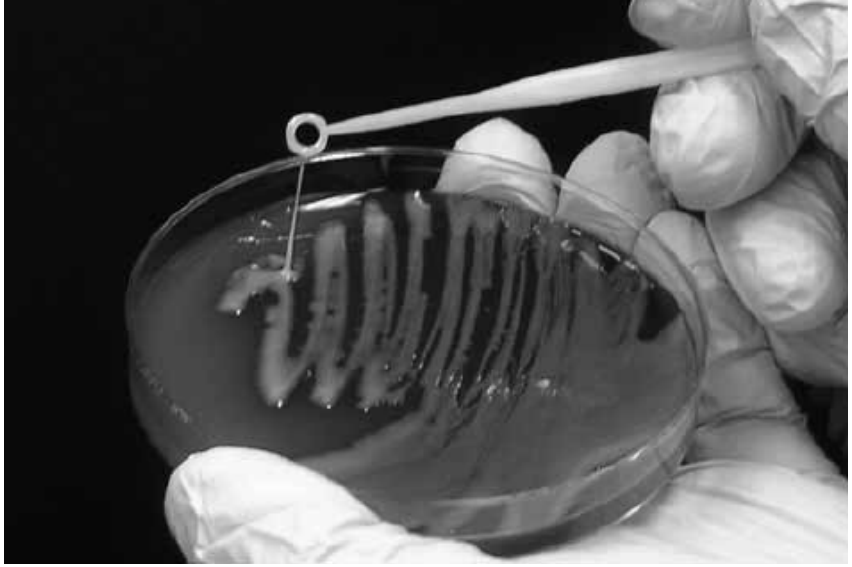
- Insulin dependent?
- Common alleles?
- Mouse Models?
- Rat model?

Remember Your Type II Diabetes Tidbits

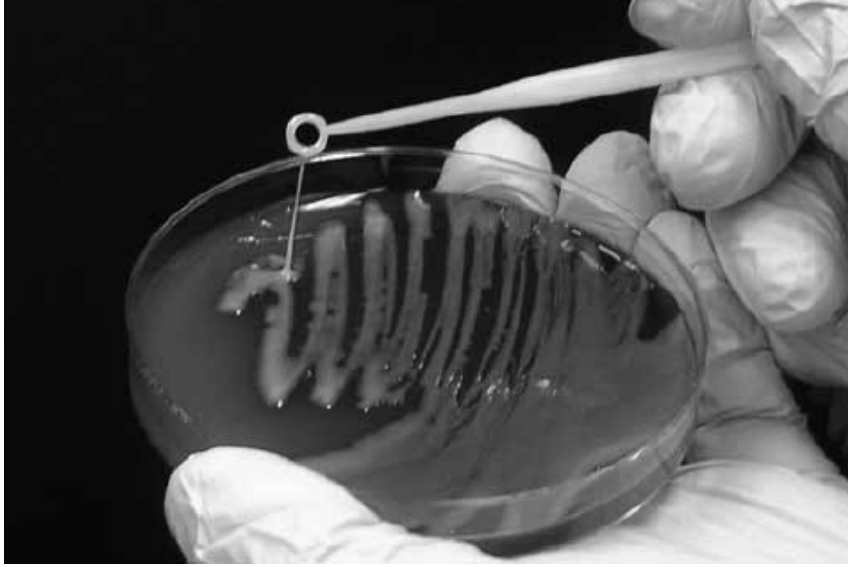
- Insulin dependent?
  - NIDDM
- Genes commonly mutated?
  - Lep and Lepr
- Mouse Models?
  - Ob/Ob and Db/Db
- Rat model?
  - Fatty Zucker

Epidemiology of Invasive *Klebsiella pneumoniae* with Hypermucoviscosity Phenotype in a Research Colony of Nonhuman Primates

Robin L Burke,* Chris A Whitehouse, Justin K Taylor, and Edward B Selby



- Shown above is the “string” assay used to phenotype *Klebsiella pnuemoniae.* Which of the following is/are true regarding this bacteria?
  1. Resulting disease is typically mild
  2. Resulting disease is typically fulminant
  3. Disease in OWP is more severe than NWP
  4. Disease in NWP is more sever than OWP
  5. Exudate is most often fibrinous to fibrinopurulent



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Now, go forth with confidence and pass this quiz