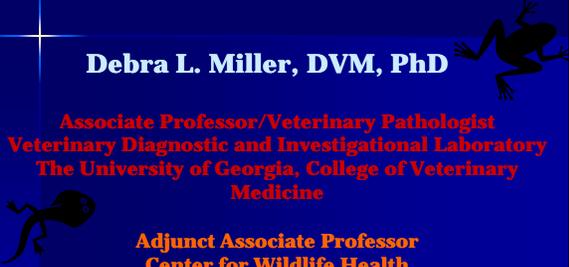


**Amphibian
Diseases and Pathology**

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Definitions:

- Pathology = absence from normal.
- Disease = a condition that impairs normal function
- Pathogen = organism that is capable of causing disease (viruses, bacteria, fungi, parasites)
- Not all pathogens cause disease all of the time
- Not all diseases are caused by pathogens (ex: diabetes, most cancers)

PLEASE REALIZE:

- Symptom is used in HUMAN medicine NOT for animals
 - Things we feel and the patient describes to the physician
- Signs occur in Humans and Animals
 - Things we can measure or observe

Gross External Changes (what you might find in the field)

- Swollen body or legs: edema
- Red coloration: erythema
- Red depressions where skin is missing: ulcerations
- Scrapes and scabs: abrasions
- Missing limbs: malformations, necrosis of distal limbs, trauma
- Sheets of missing skin on limbs: degloving
- Thickened or unshed skin: Proliferation of the skin
- Bumps: parasitic or other organisms cysts
- Loss of pigment in teeth of tadpoles



Loss of pigment in keratin 'teeth' of tadpoles



**Proliferation/thickening of skin
Excessive shedding**



<http://www.nationalparks.gov.au/npsas.nsf/Content/Frog+Chytrid+fungus>

Missing Limbs



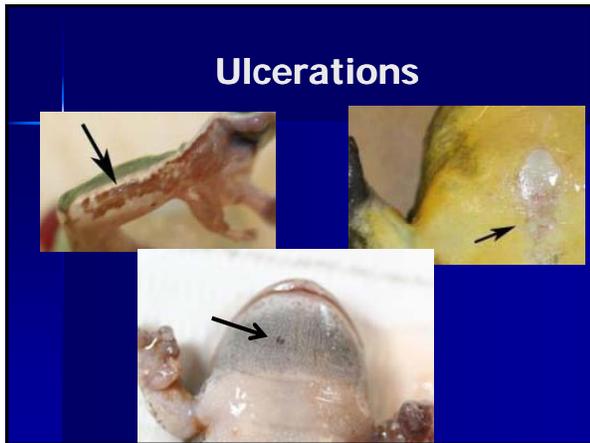
Degloving



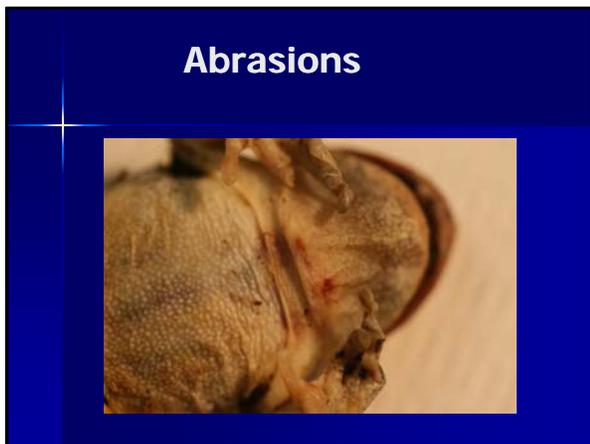
Lumps and Bumps



Ulcerations



Abrasions



SEASONAL or ABNORMAL?



Gross Internal Changes: what you might see on necropsy

- Swollen pale liver: Fatty change
- Tan spots in organs (esp. liver, kidney): possible necrosis
- Round cysts or lumps: Granulomas or parasitic cysts
- Red organs: possible hemorrhage or congested vessels

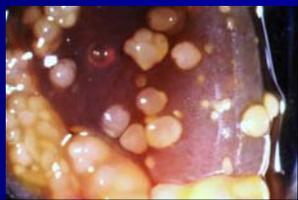
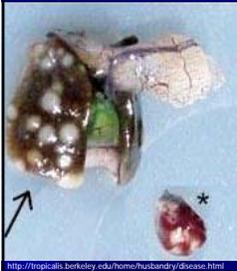
Pale organs



Tan areas on organs



Cysts and Nodules



<http://topicalis.berkeley.edu/home/husbandry/disease.html>

Hemorrhages



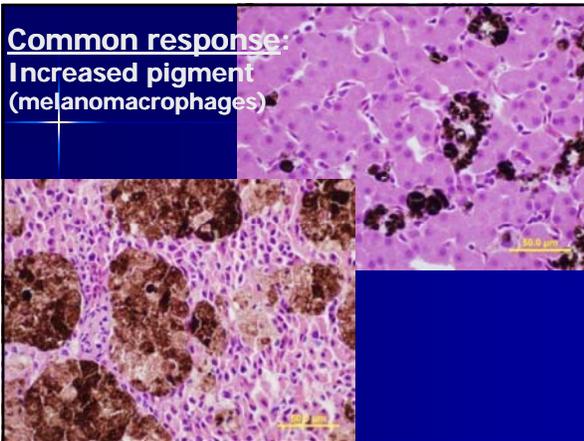
BE AWARE OF NORMAL STRUCTURES!



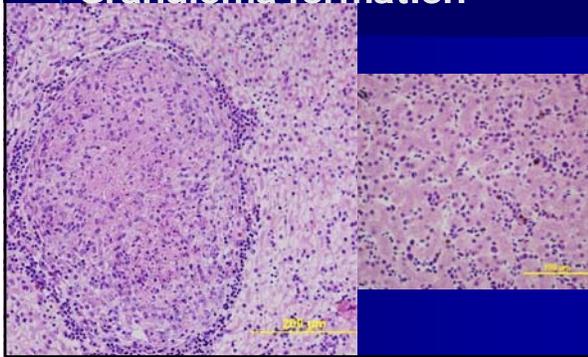
Histopathological Changes: what you might see under the microscope

- Increase in Melanomacrophage Centers
- Granulomas
- Necrosis (dead cells/organs) or degeneration (compromised cells/organs including fatty change in liver)
- Hemorrhage or congested vessels
- Bacteria
- Fungi
- Viral Inclusions
- Parasites

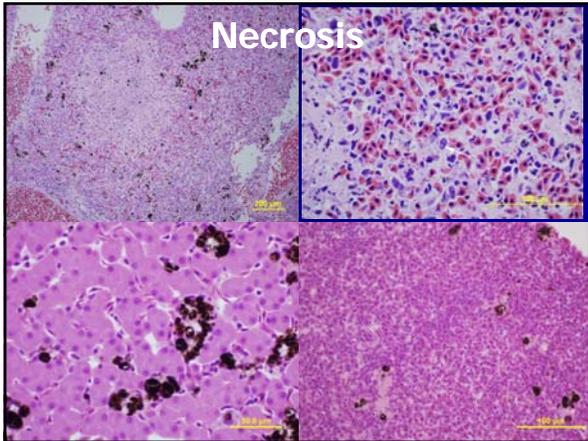
Common response: Increased pigment (melanomacrophages)



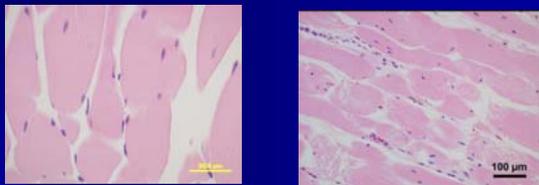
**Common response =
Granuloma formation**

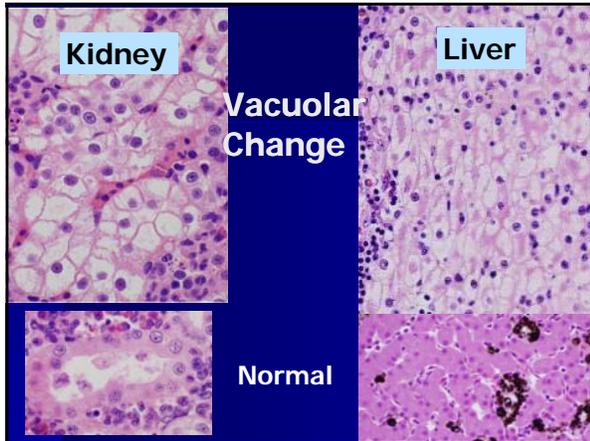


Necrosis

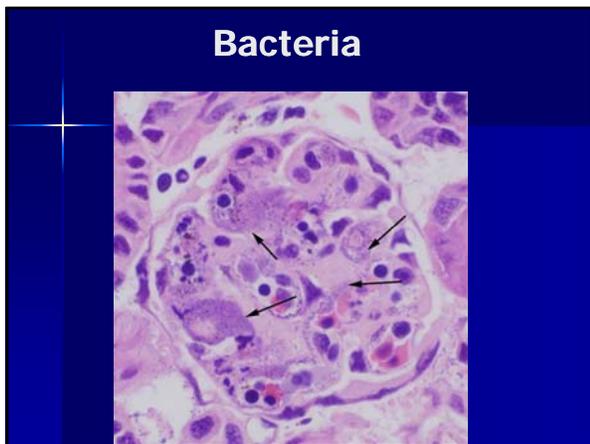


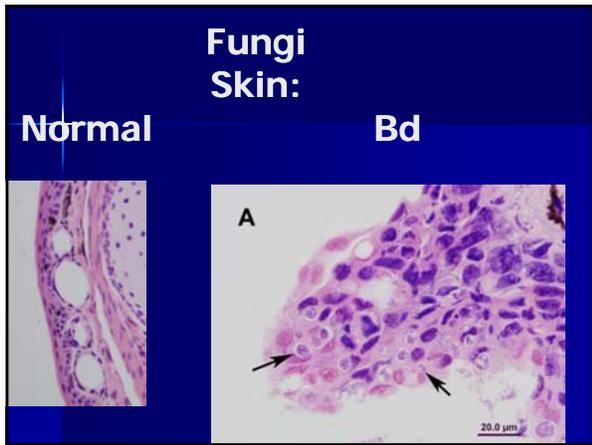
Muscle
Normal Degeneration



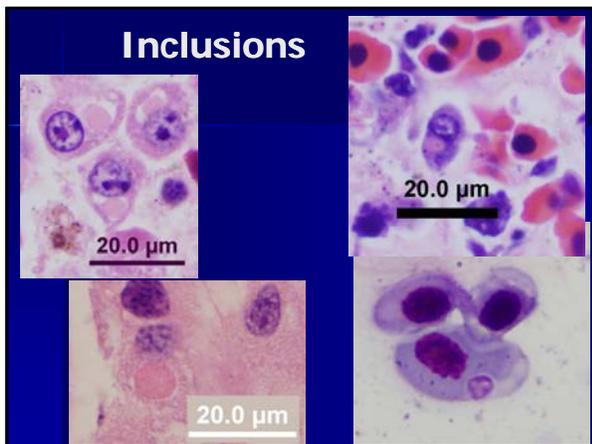


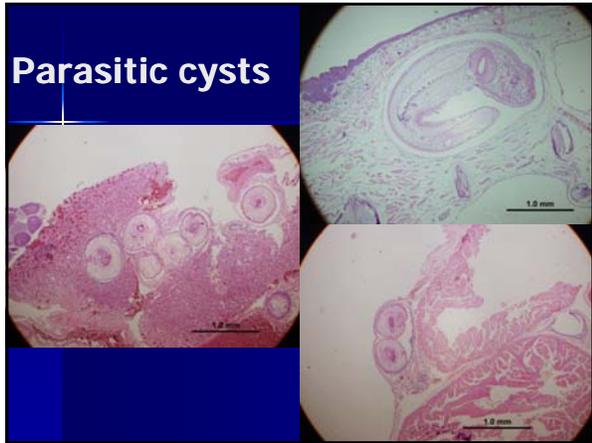




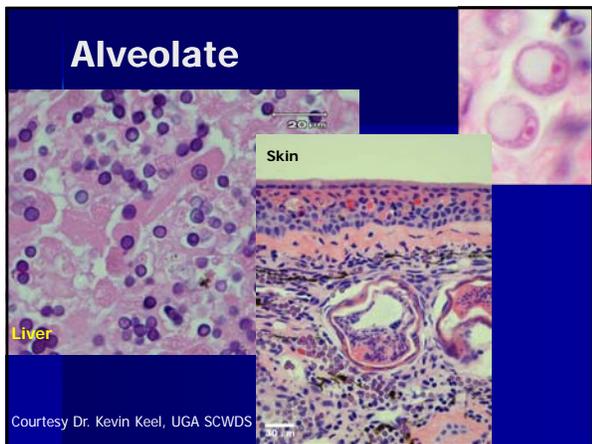












Questions?



LAB TIME: Organ Review









