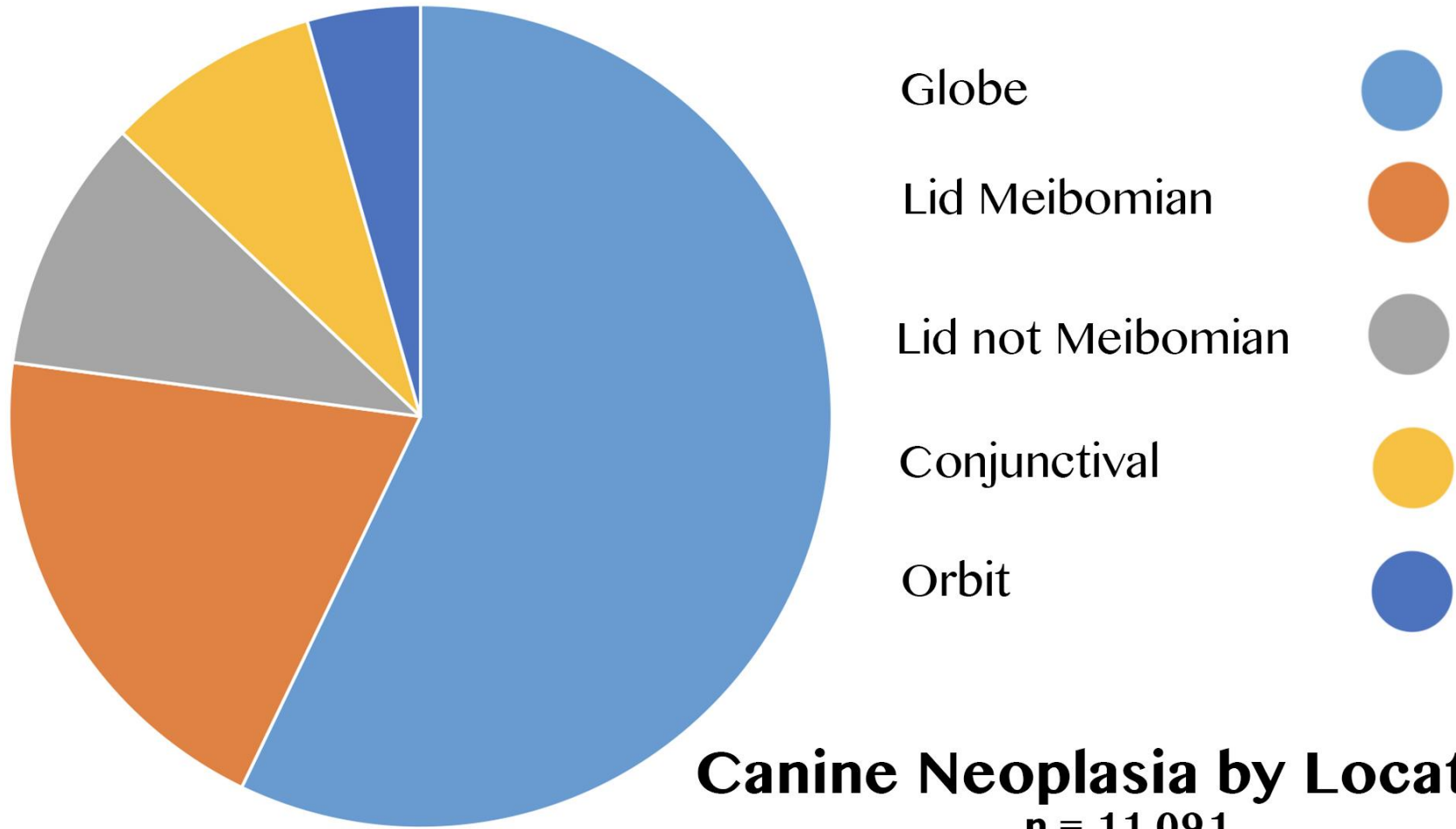


Primary Tumors of the Canine Conjunctiva, Eyelids and Orbit

Richard R Dubielzig

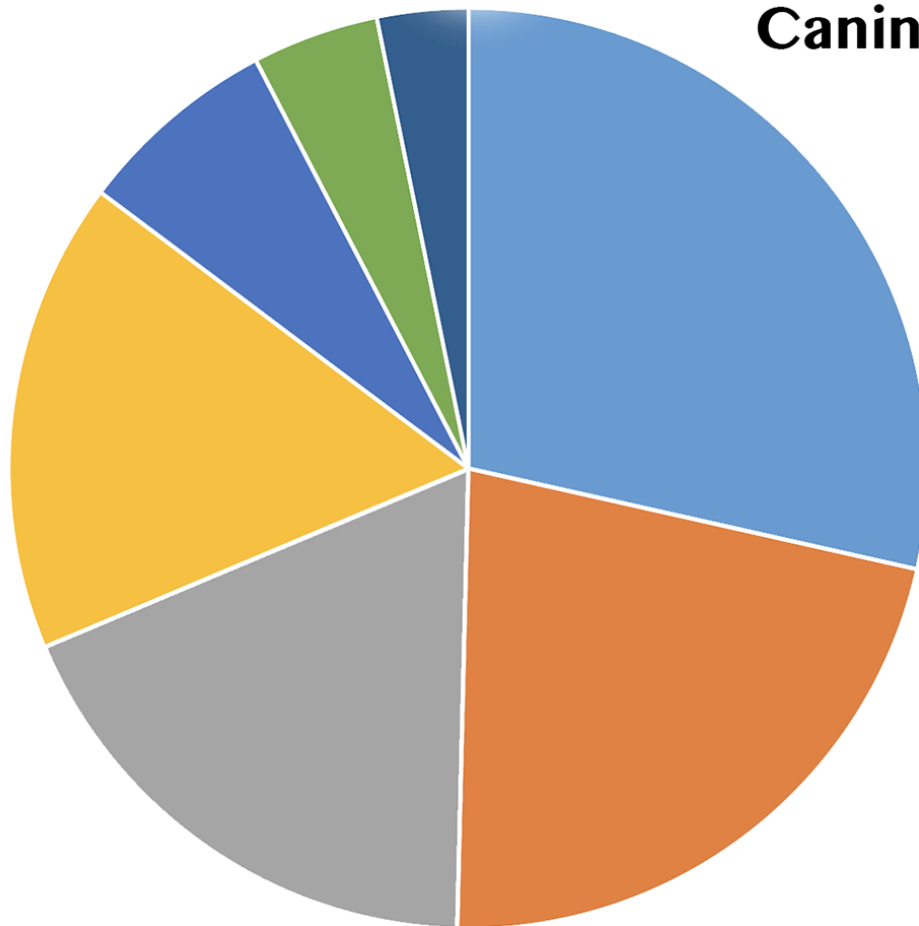
Canine Ocular Neoplasia by Location



Canine Neoplasia by Location
n = 11,091

Canine Conjunctival Neoplasia

Canine Conjunctival Neoplasia
n = 1280



Conj Melanoma

Hemangio

Squamous Papilloma

Adenocarcinoma

Mast Cell Tumor

Lymphoma

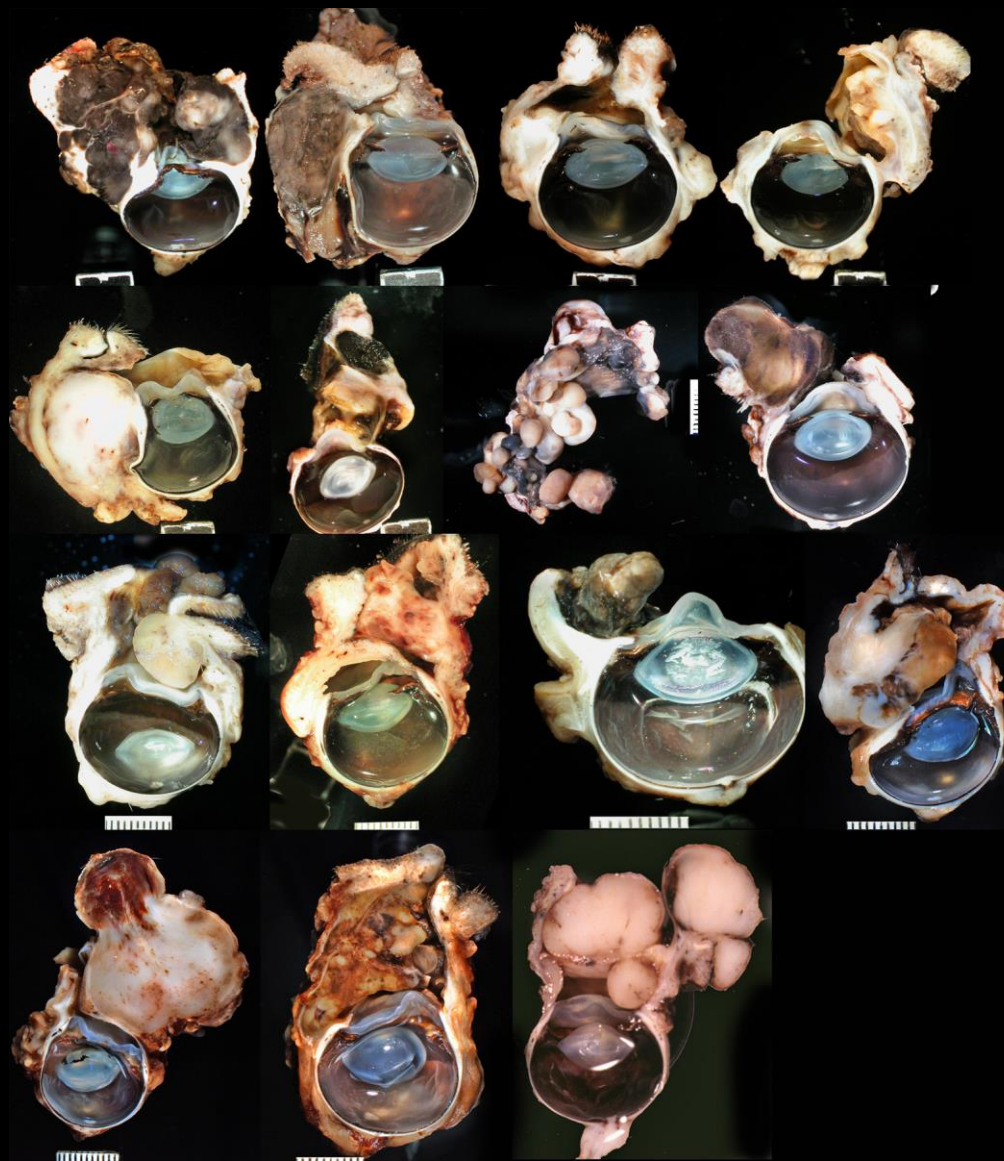
SCC

Conjunctival Melanoma

- 365 cases
- Most are malignant by morphologic criteria
- Most recur elsewhere on the conjunctiva when removed
- They are less likely to metastasize than recur
- Those on the palpebral conjunctiva are more likely to metastasize



Conjunctival Melanoma



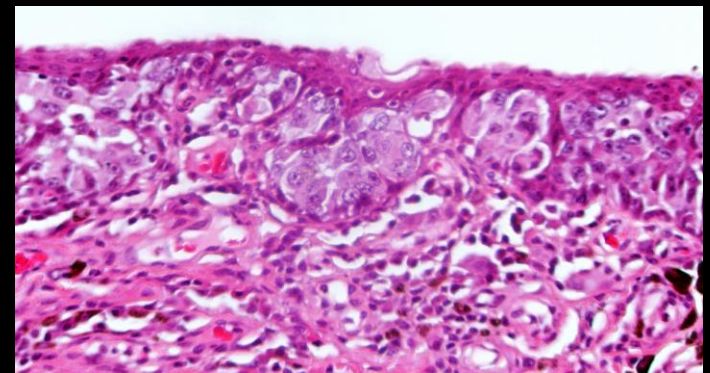
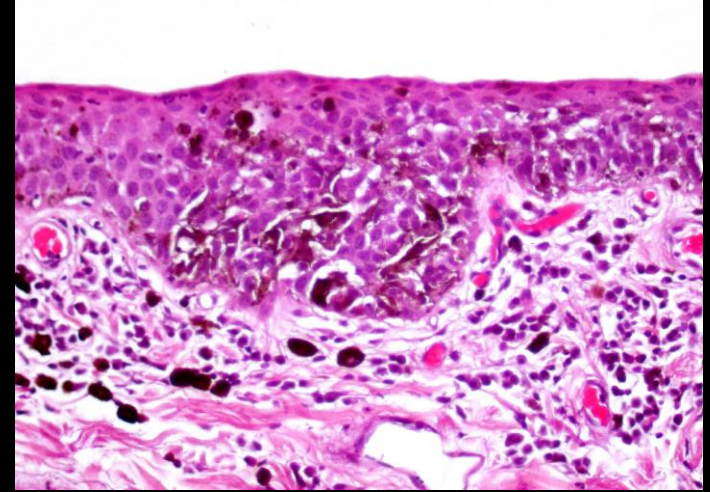
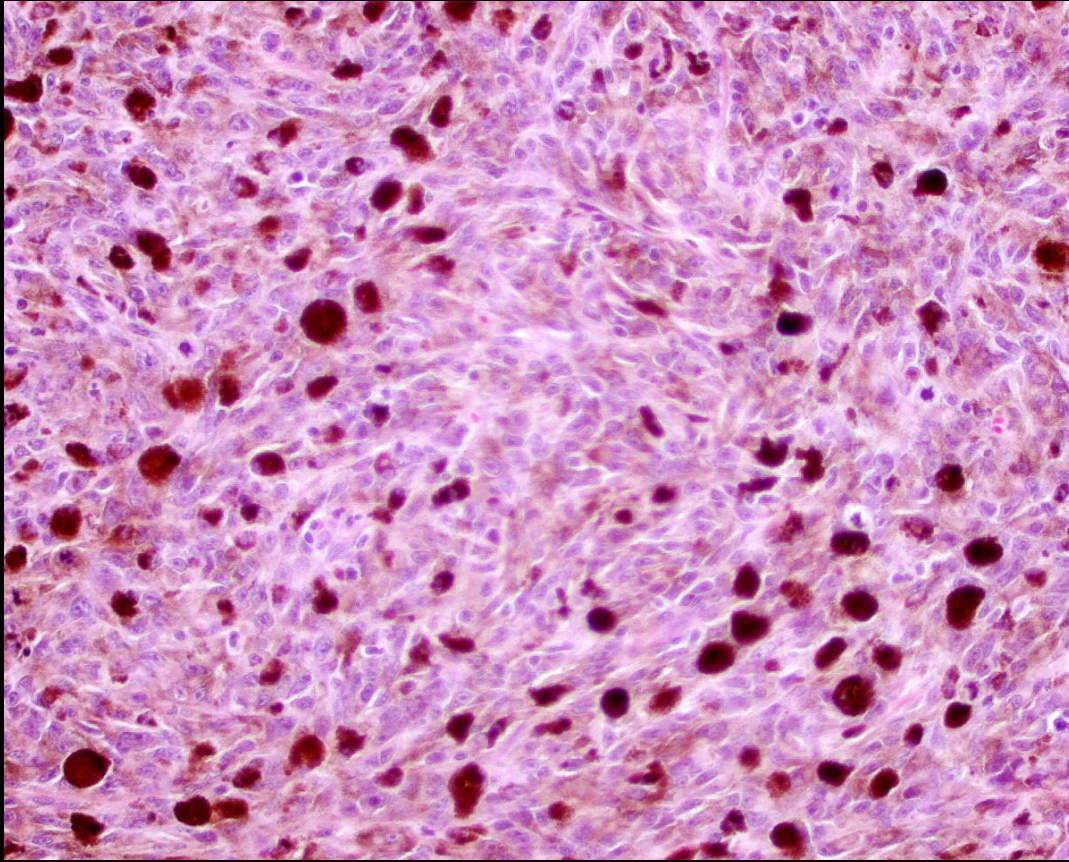
Conjunctival Melanoma

typically multifocal distribution



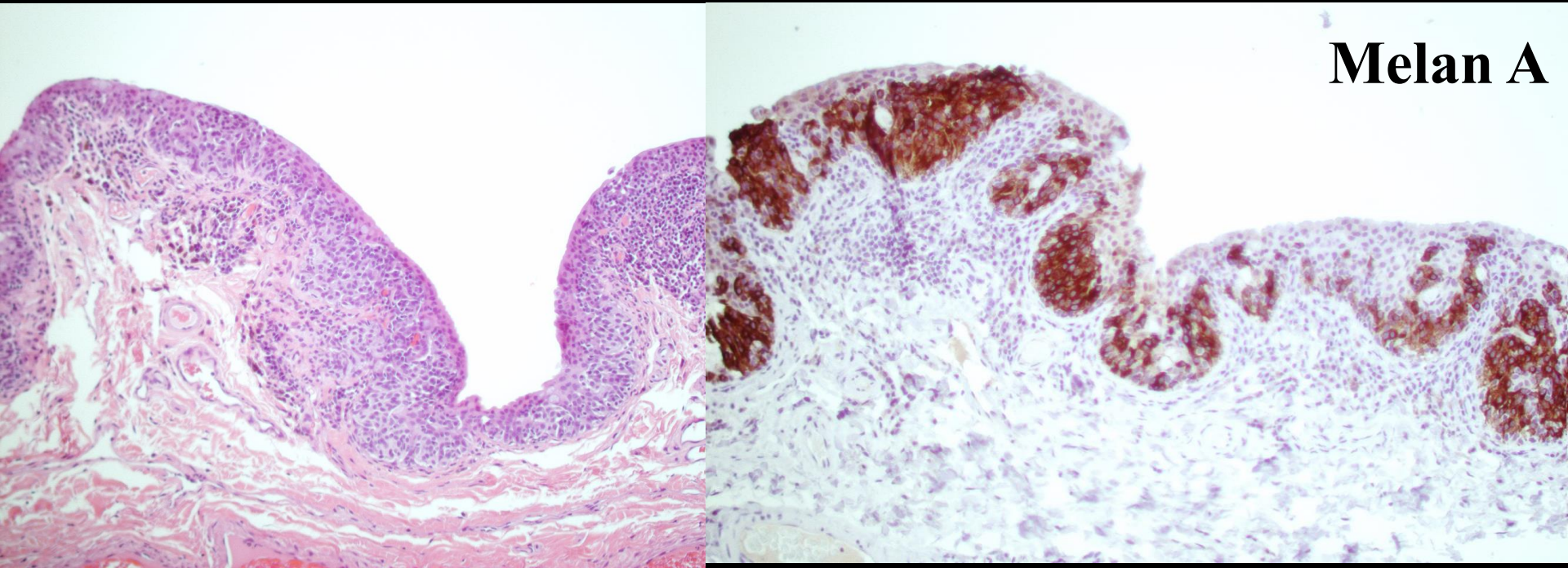
Conjunctival Melanoma

pagetoid spread within the epithelium



Conjunctival Melanoma

pagetoid spread within the epithelium

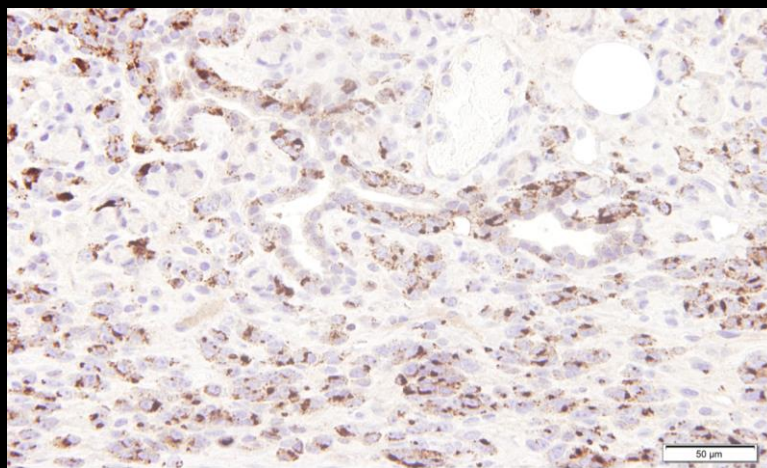
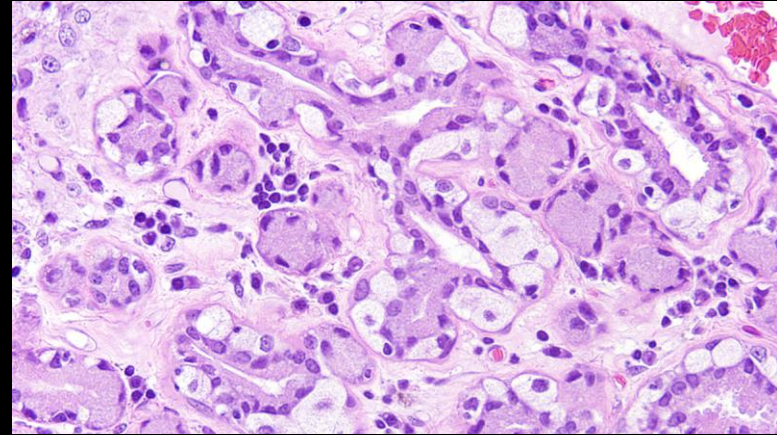
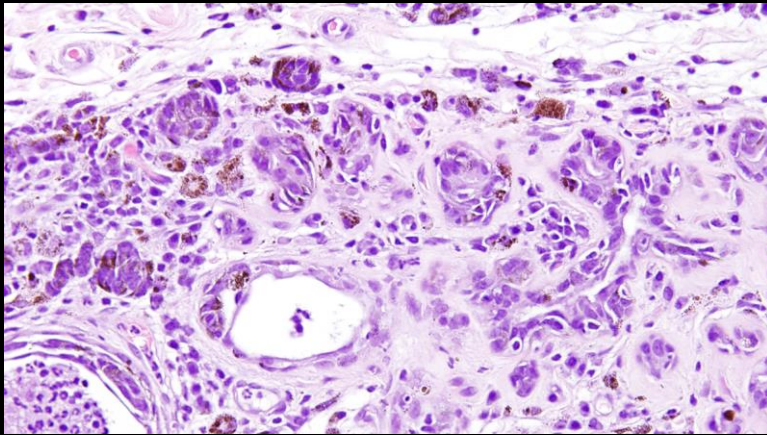


Intraepithelial “Pagetoid” spread

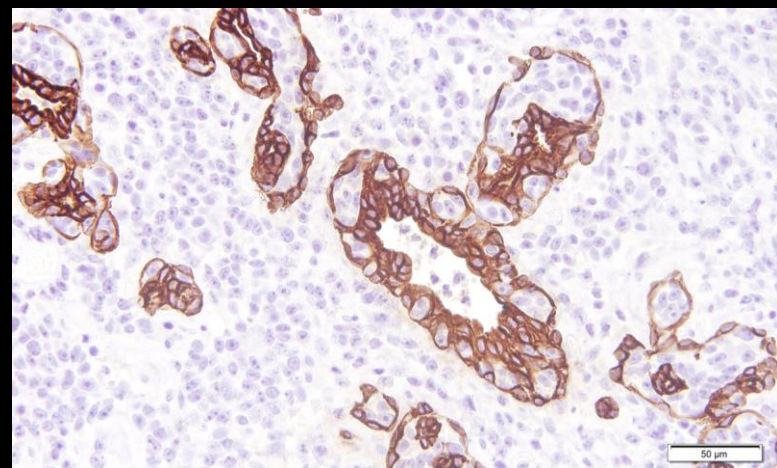
Conjunctival Melanoma

pagetoid spread within the epithelium

And extending into the gland



Melan-A

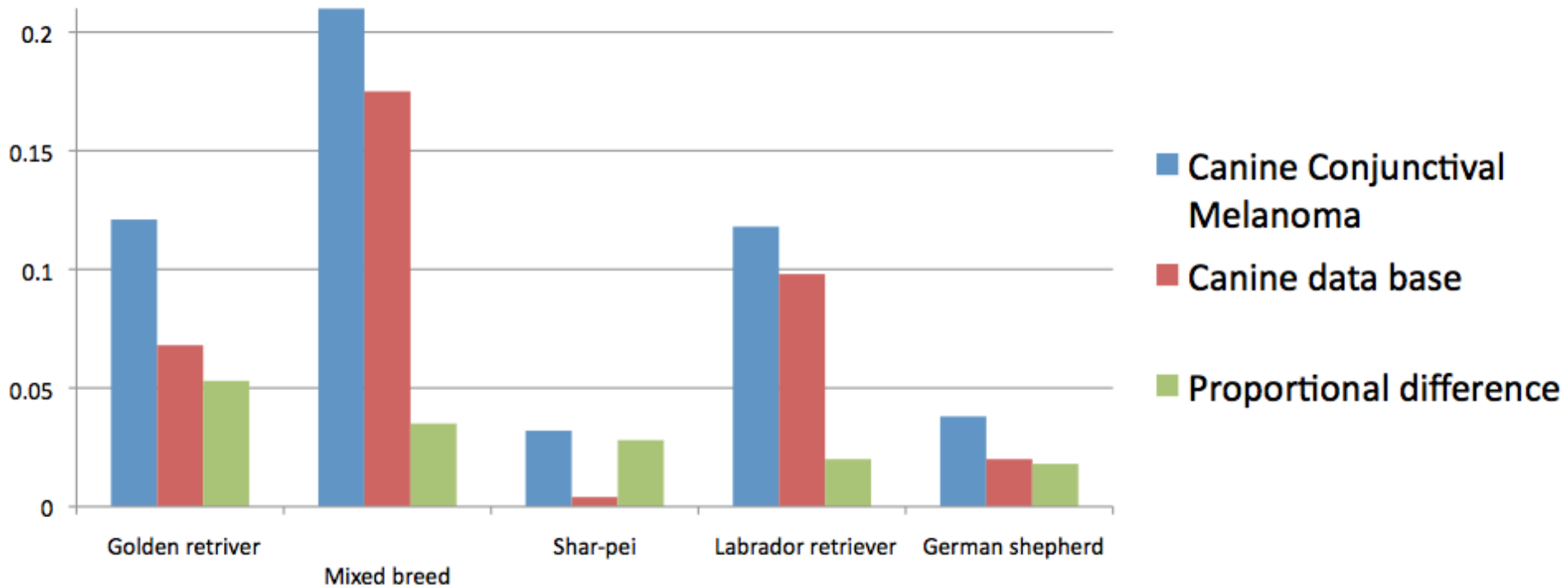


Cytokeratin

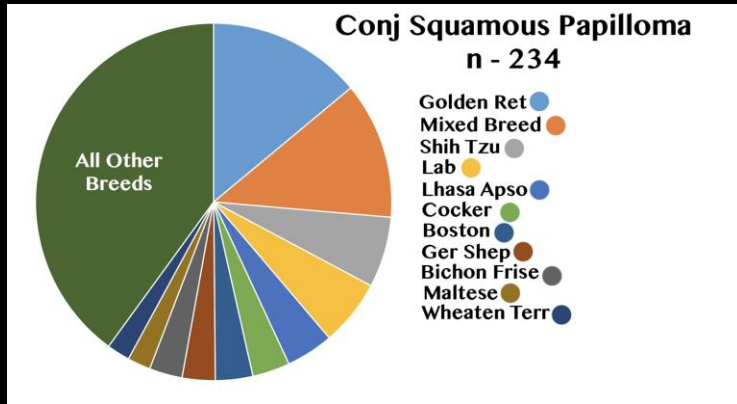
Intraepithelial “Pagetoid” spread

Conjunctival Melanoma

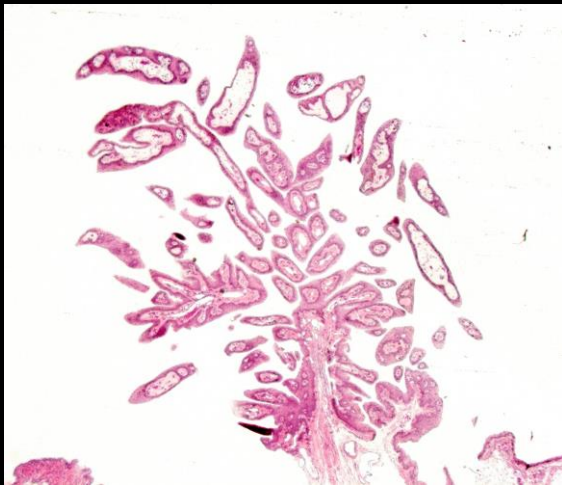
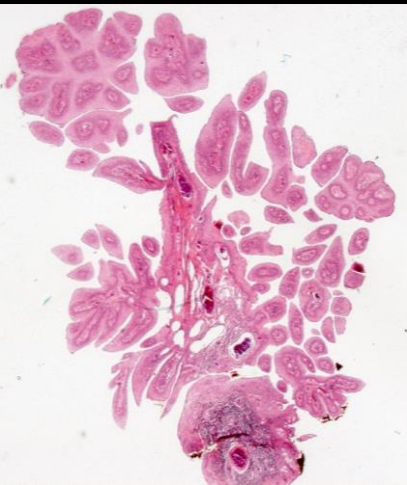
Canine data base - 29,760 records
Conjunctival Melanoma - 314 records
Overrepresented breeds



Canine Conjunctival Squamous Papilloma



- Characterized by pointed fronds of epithelium
- No underlying inflammation or neoplasia
- These are seldom correctly diagnosed clinically



Canine Conjunctival Squamous Papilloma

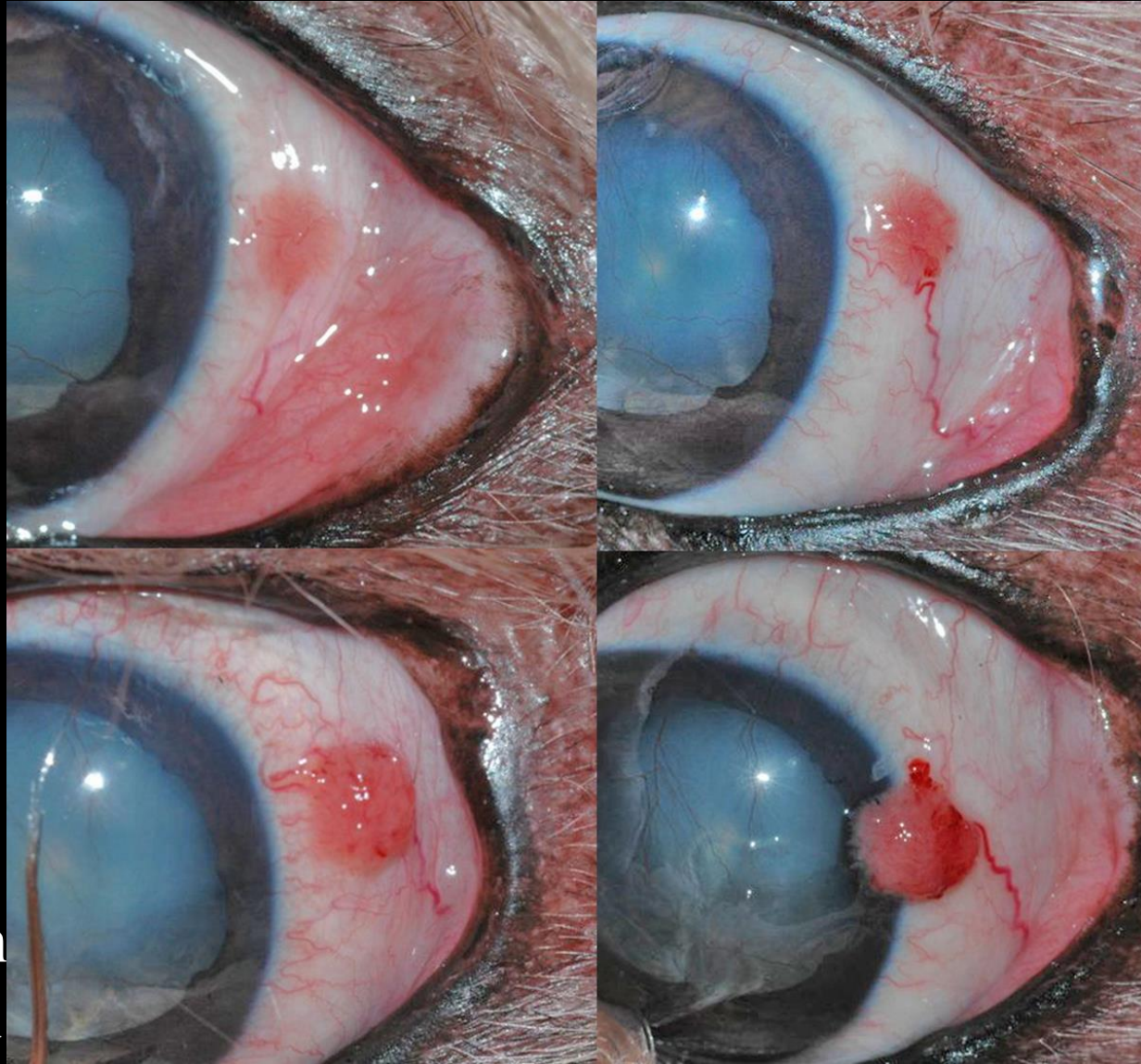
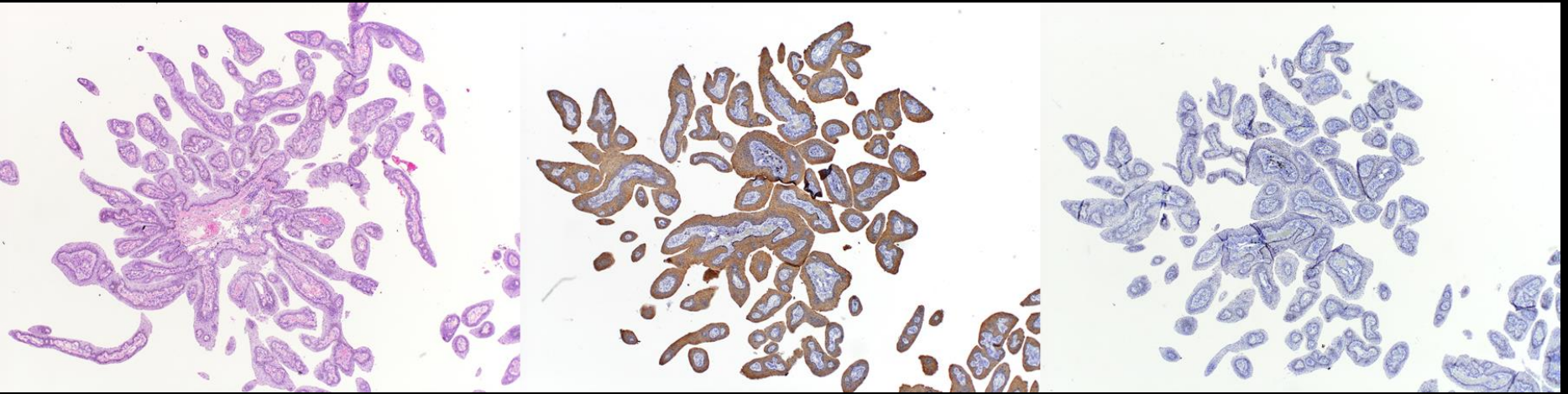
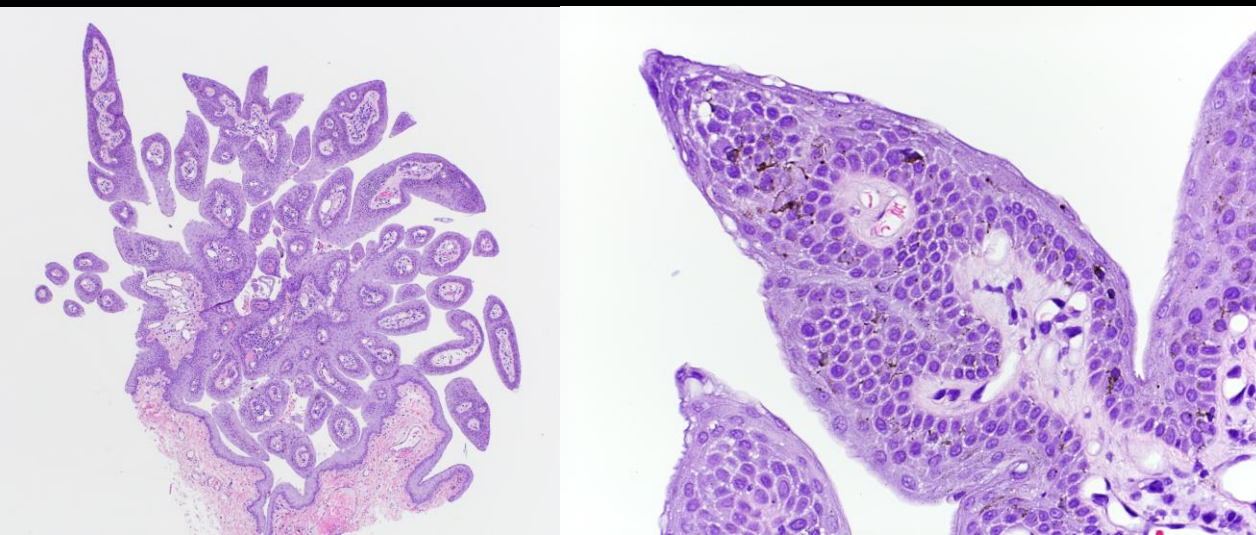


Image From
John Mould

Canine Conjunctival Squamous Papilloma

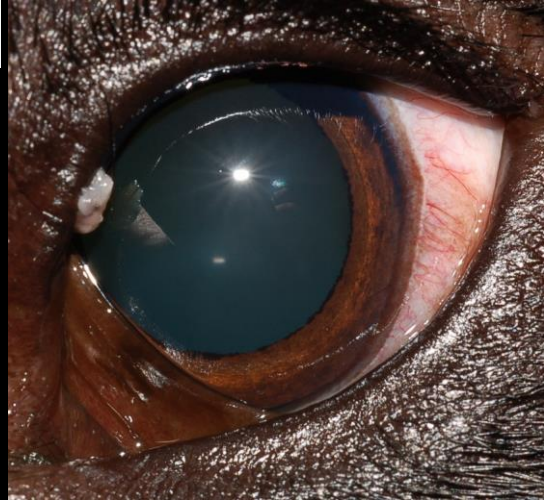
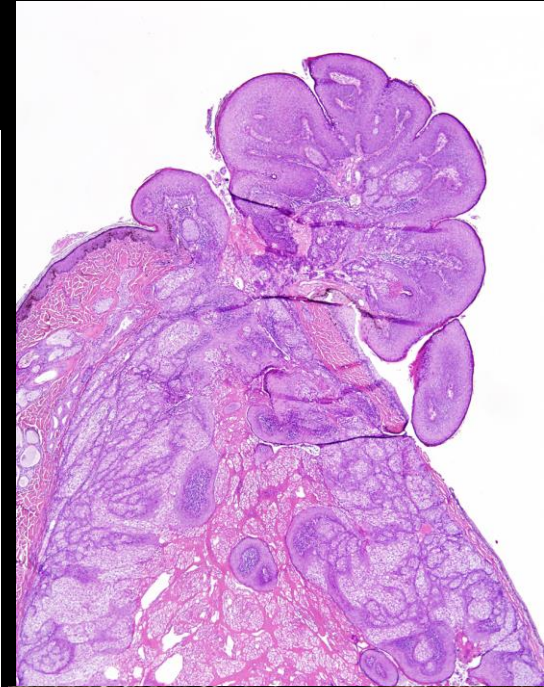
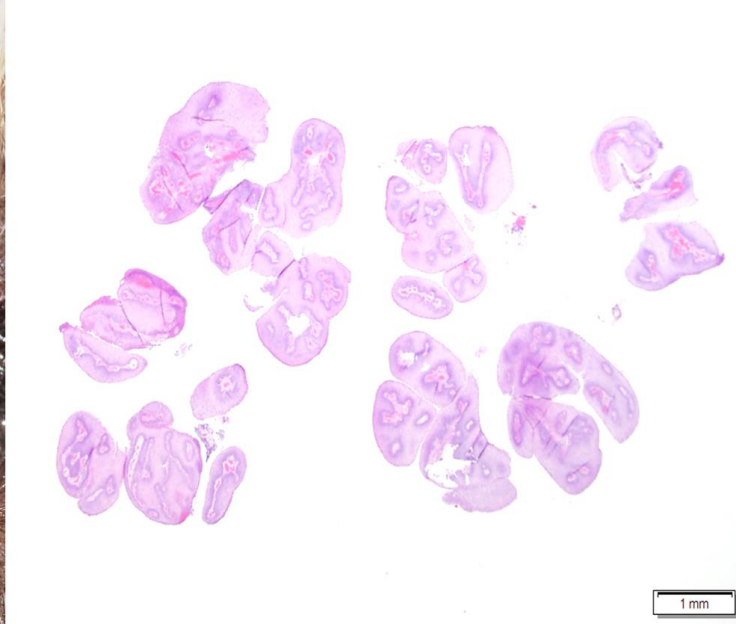


**Non-specific negative staining with papilloma viral antigen
and negative for canine papilloma virus by PCR**



**Pointed edged
fronds**

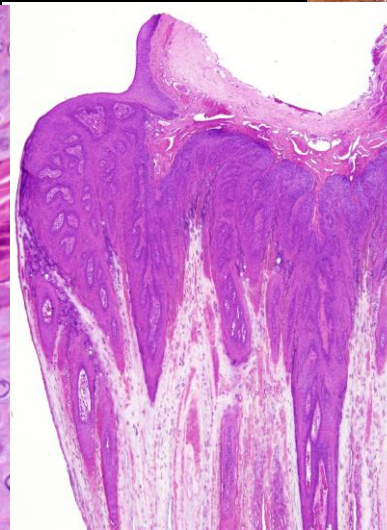
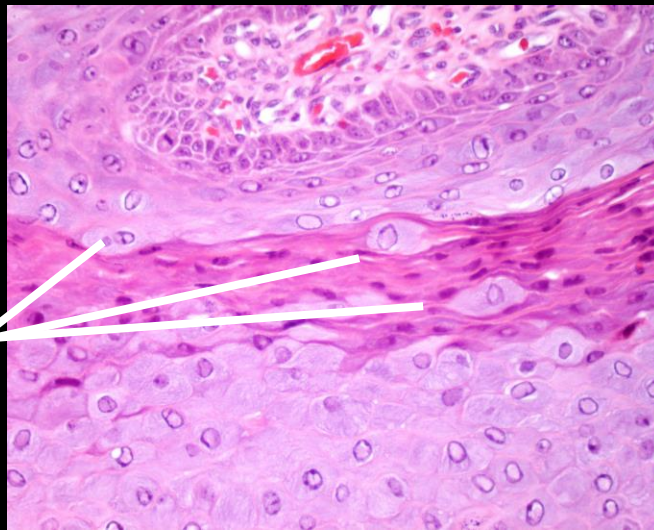
Canine Conjunctival Reactive Papilloma



- Most often associated with tumors or inflammation, hence reactive

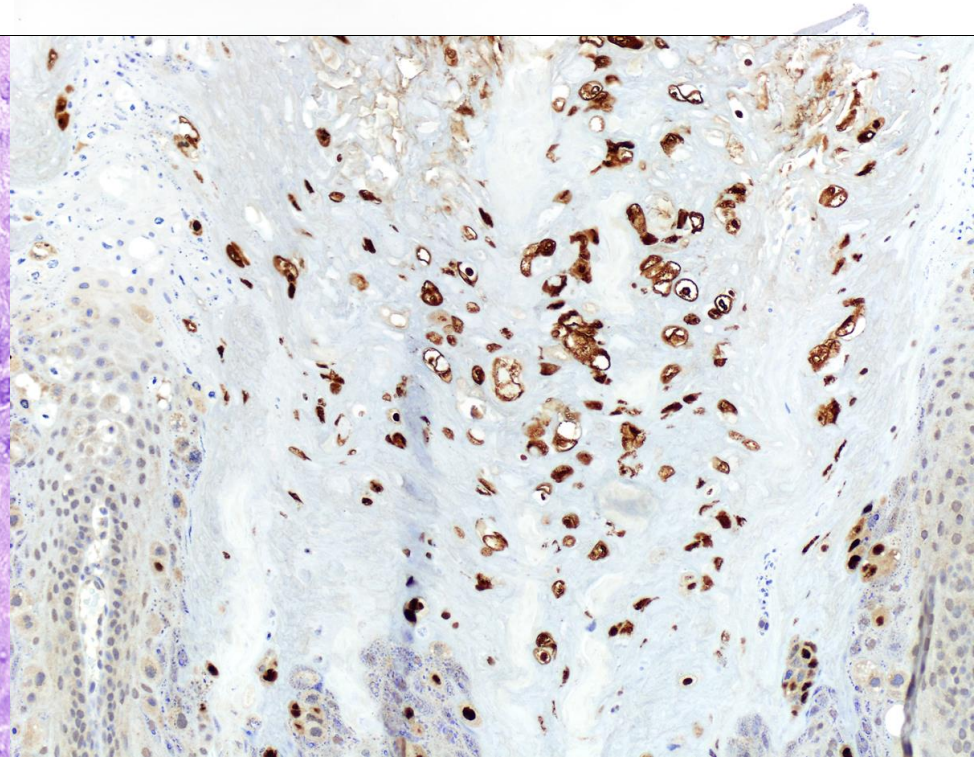
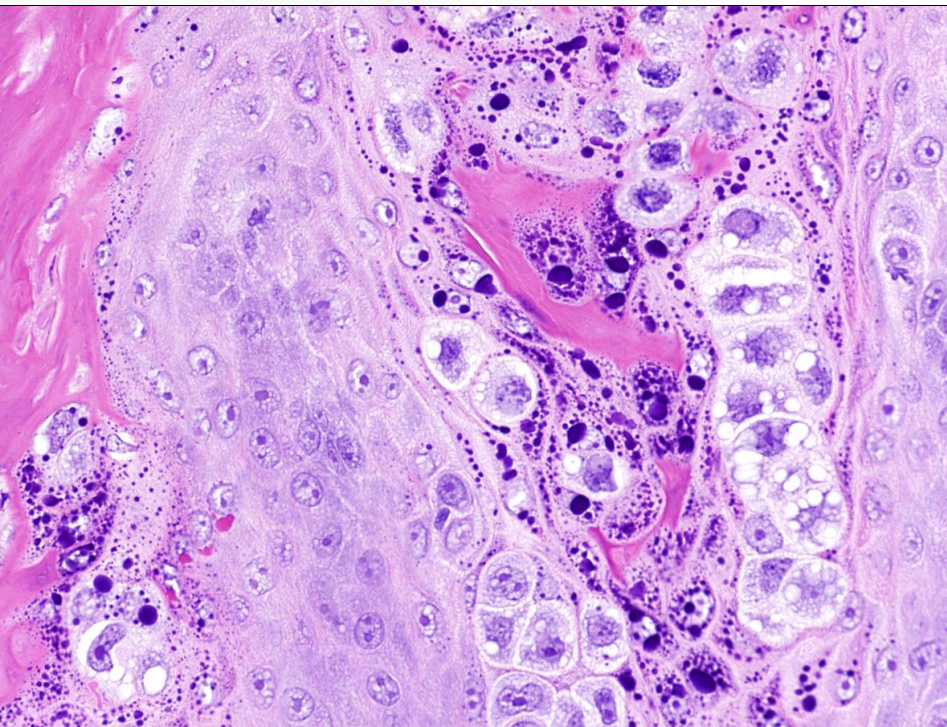
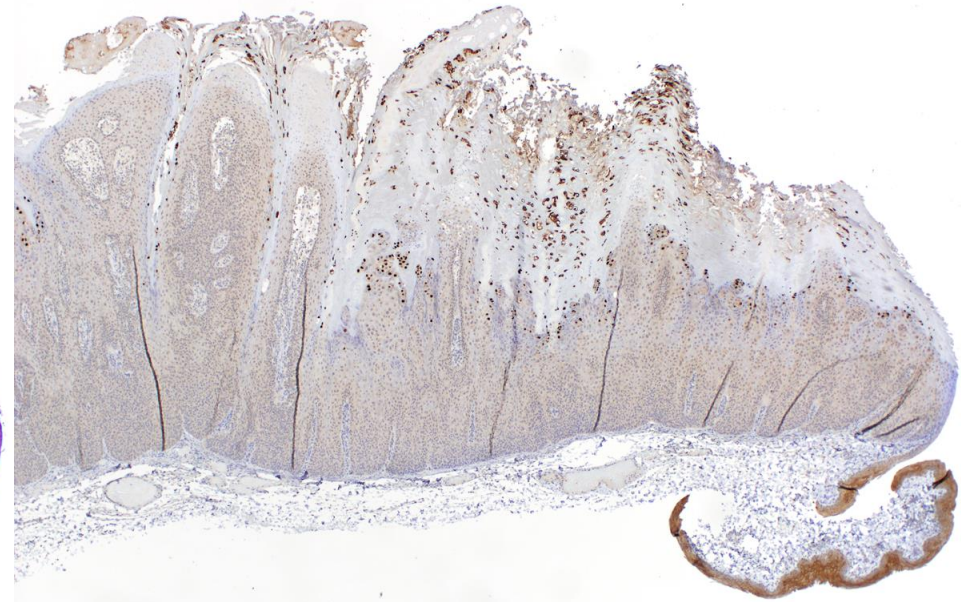
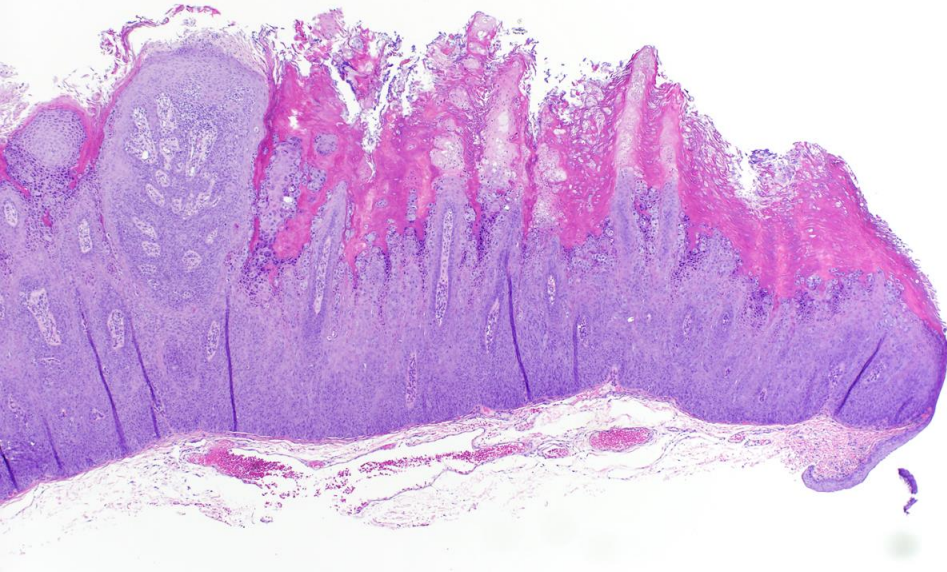
Canine Viral Papillomas

- 81 cases in the COPLOW database
 - Mixed breed 15
 - Pugs, Labs, G Ret 5
- Young dogs predominate
 - 45/81 less than 3 years old
 - Can be as old as 14 years
- Can be conjunctival, corneal or eyelid



Koilocytes

Papilloma Viral Antigen



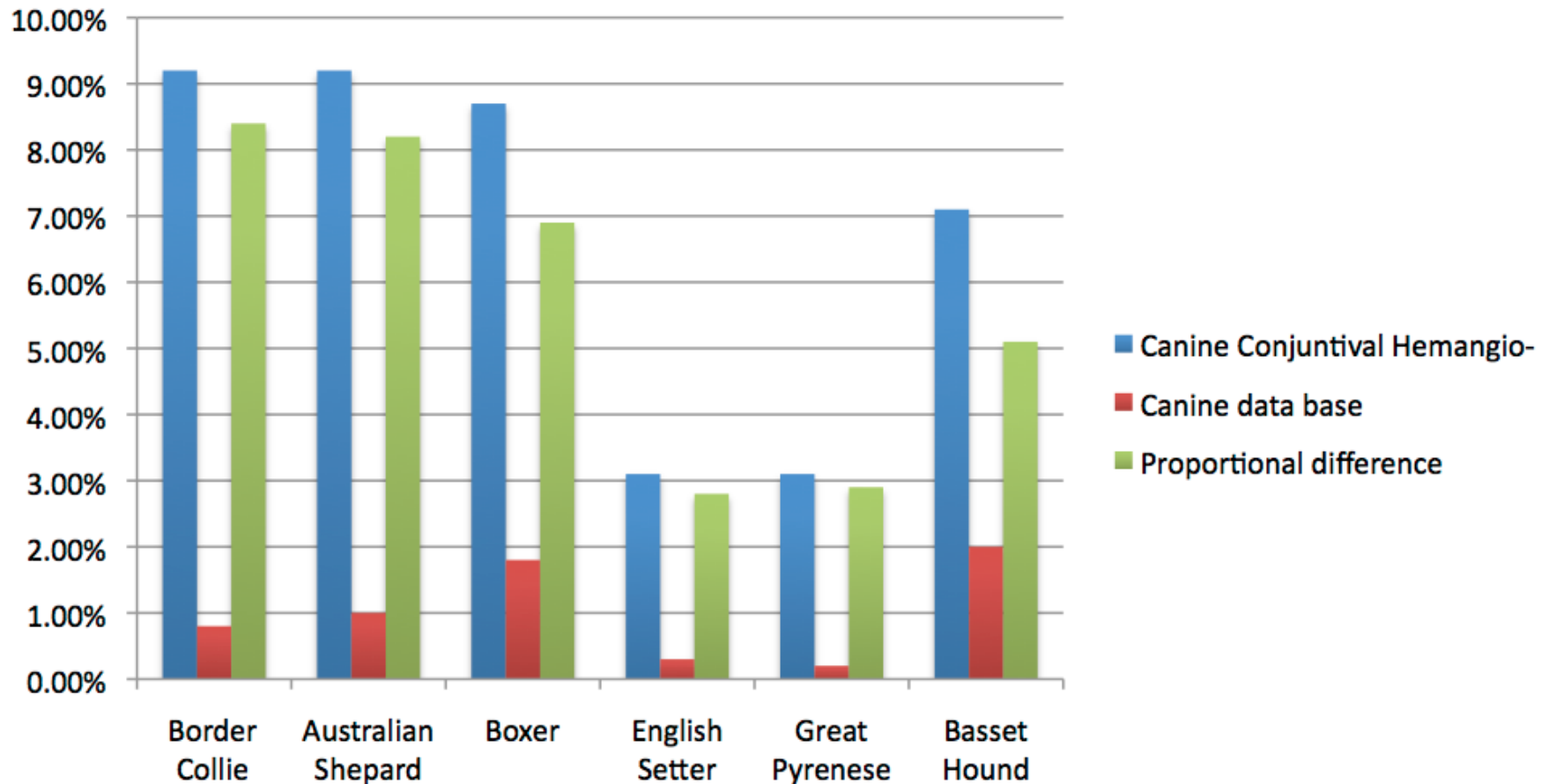
Canine Conjunctival Hemangioma and Hemangiosarcoma

- 196 cases in the COPLOW database
 - 22 Boxer
 - 18 Australian Shepherd
 - 15 Basset Hound
 - 14 Border Collies
- Located either in the temporal bulbar or at the tip of the nictitans
- Benign and malignant determined by standard criteria
- Non-pigmented conjunctiva
- Suspect UV-light exposure is a risk factor



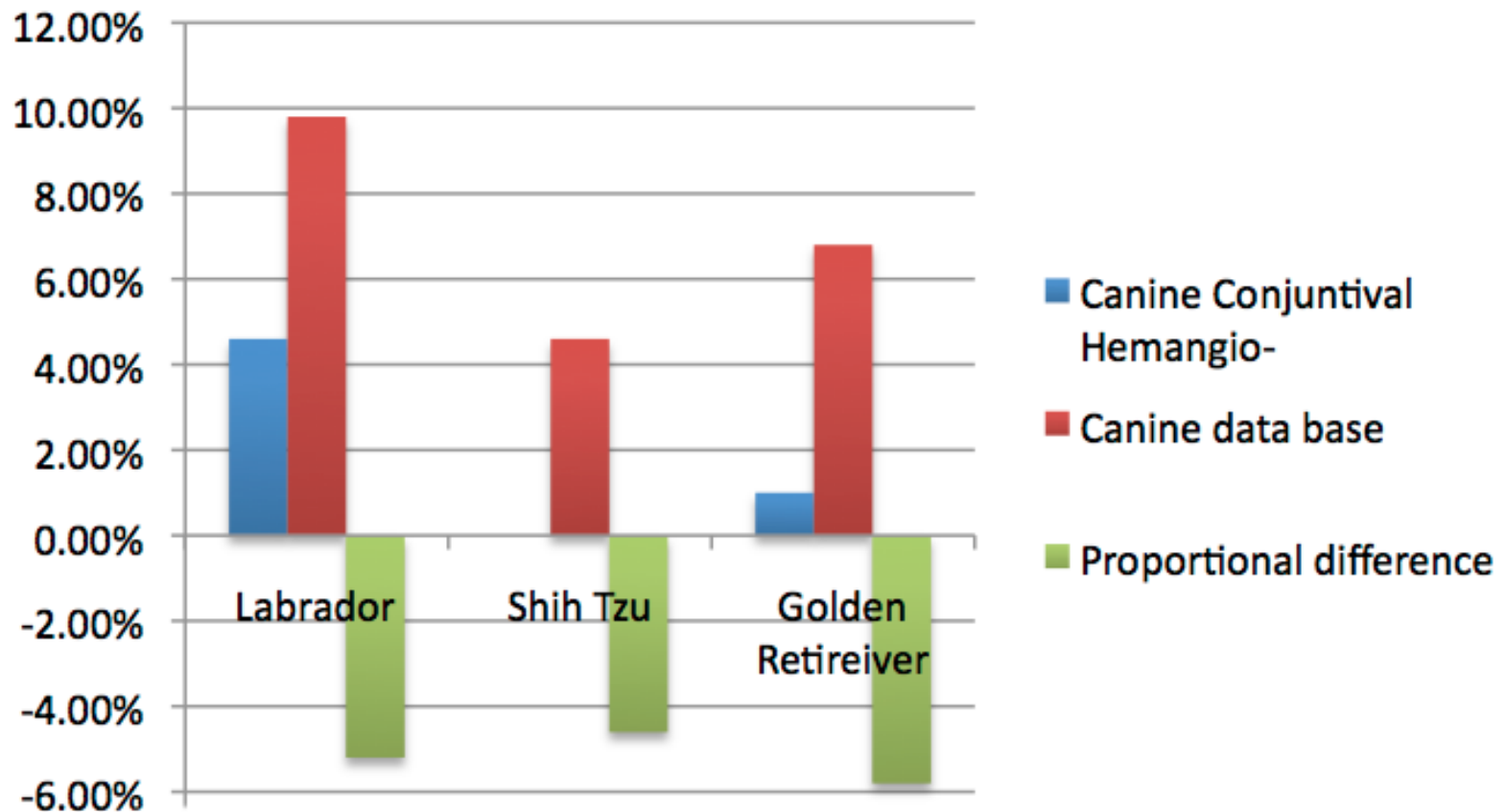
Canine Conjunctival Hemangioma and Hemangiosarcoma

Canine Conjunctival Hemangioma/Hemangiosarcoma: N = 196
Over represented Breeds
Canine Database: N = 29,822



Canine Conjunctival Hemangioma and Hemangiosarcoma

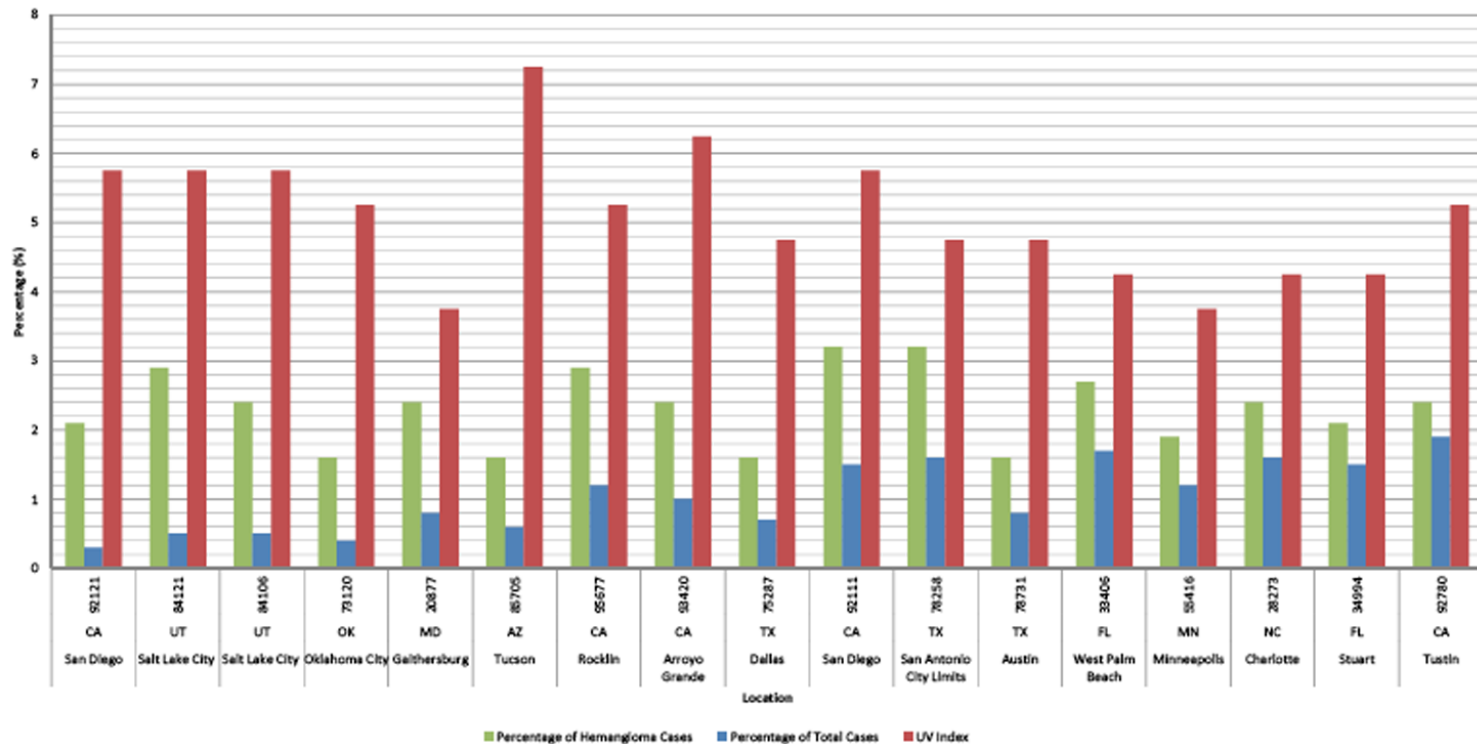
Canine Conjunctival Hemangioma/Hemangiosarcoma: N = 196
Under Represented Breeds
Canine Database: N = 29,822



Canine Conjunctival Hemangioma and Hemangiosarcoma by Zipcode

Canine conjunctival vascular tumors Cases vs Database

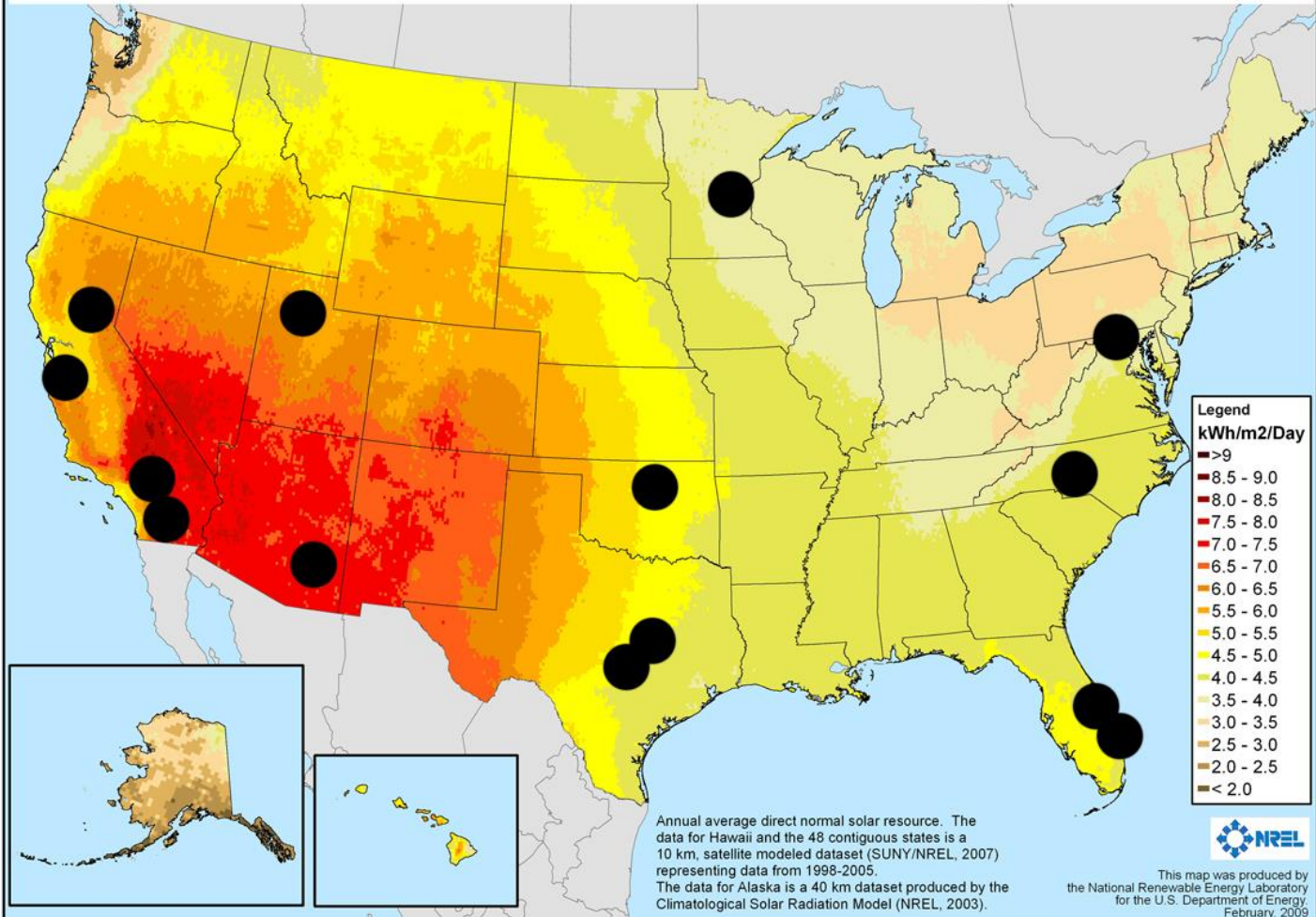
% Cases in Zip ●
 % of database in Zip ●
 UV index by Zip ●



Canine Conjunctival Hemangioma and Hemangiosarcoma

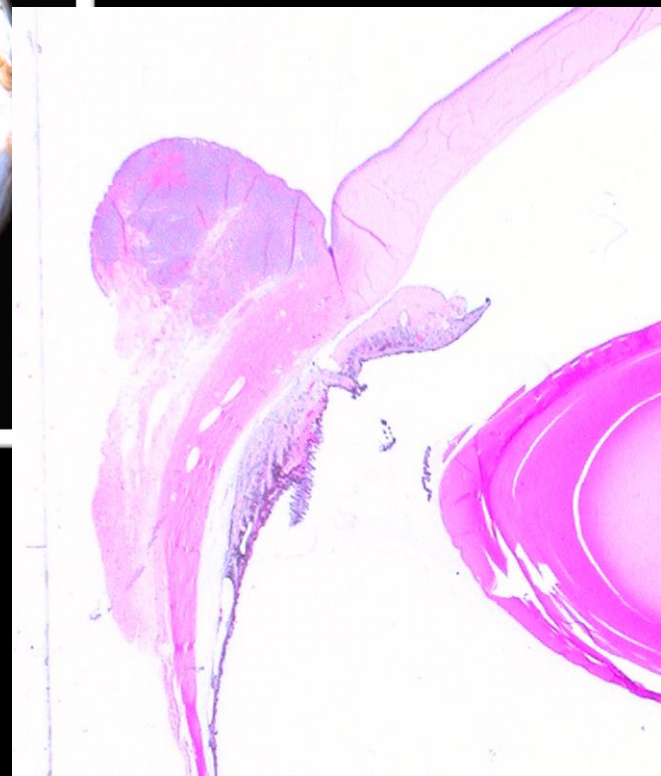
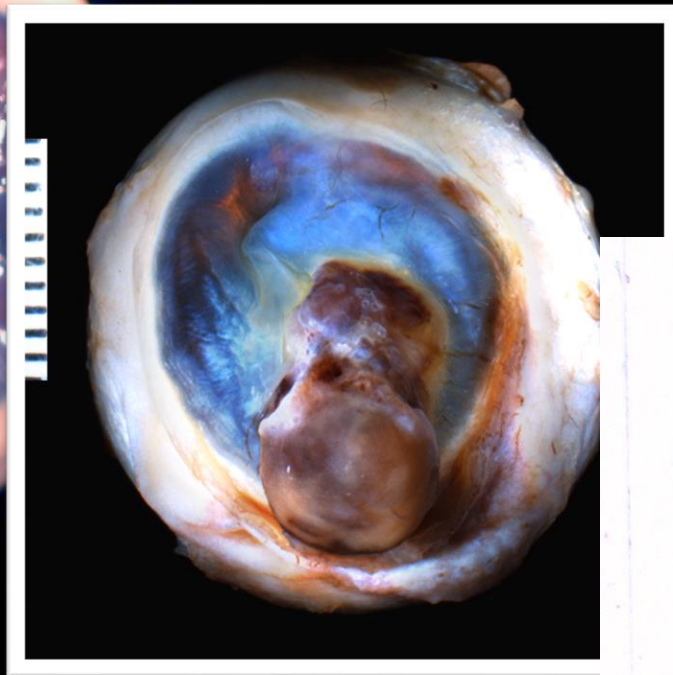
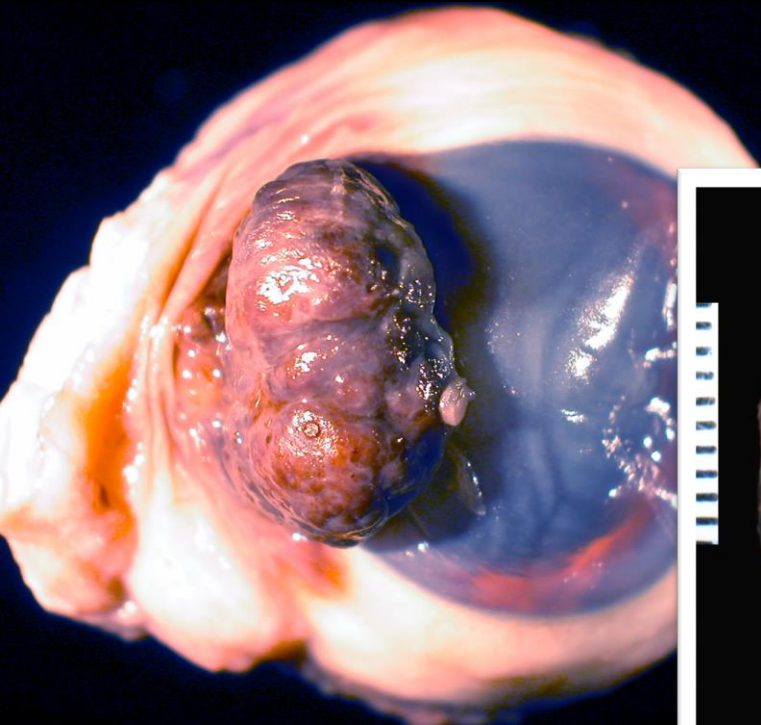
Concentrating Solar Resource:
Direct Normal

Annual



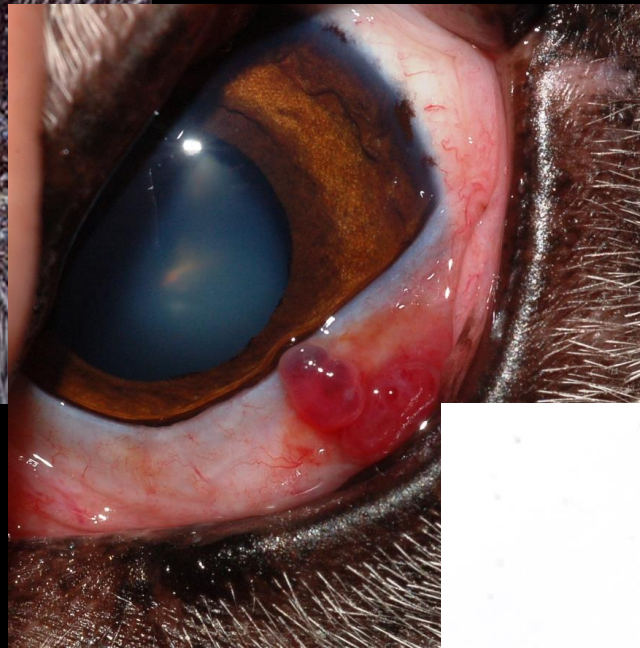
<http://www.justinholman.com/2012/02/27/bad-cartographyand-melanoma-risk-screening/>

Canine Conjunctival Hemangioma and Hemangiosarcoma

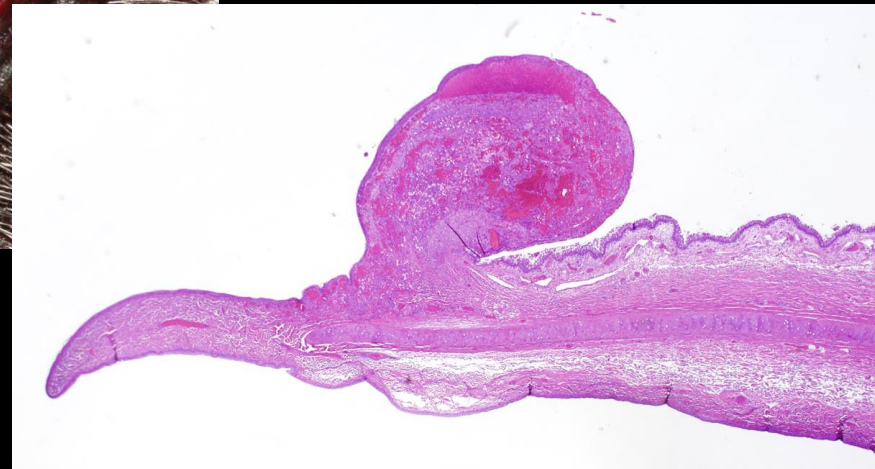


*Temporal bulbar conjunctiva
or the tip of the nictitans*

Canine Conjunctival Hemangioma and Hemangiosarcoma

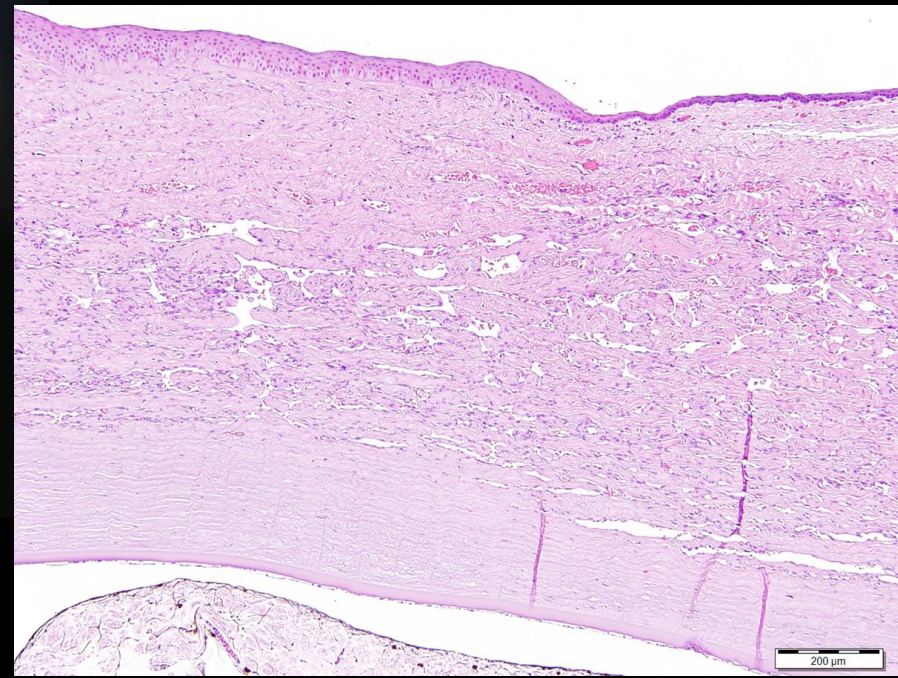
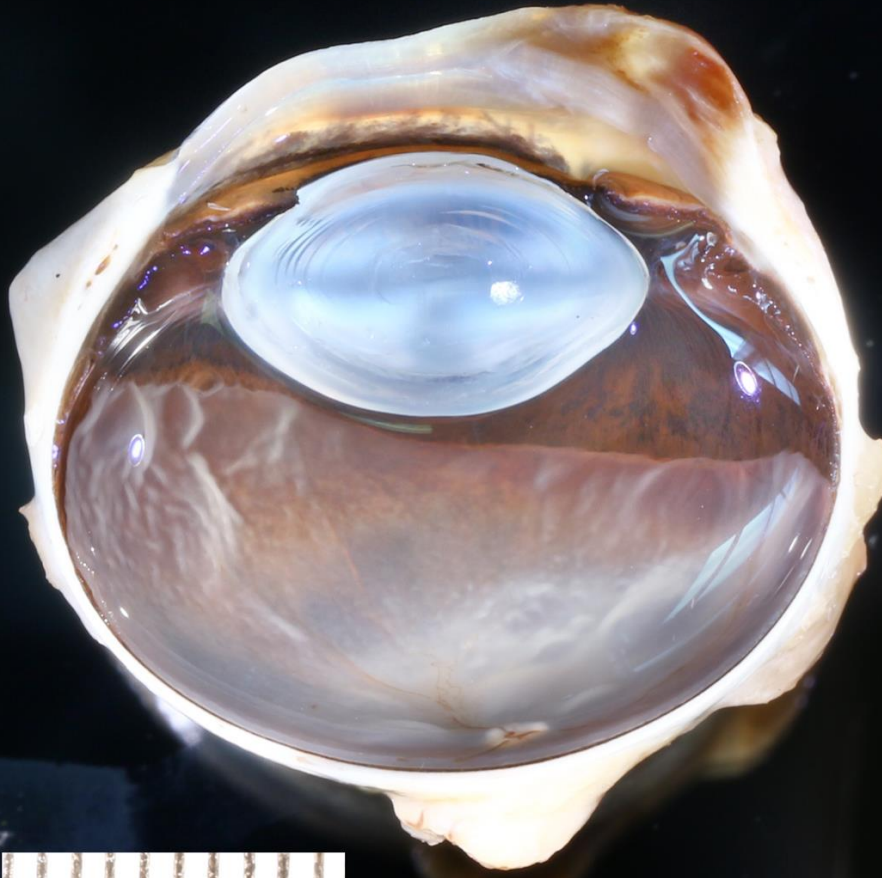


*Temporal bulbar conjunctiva
or the tip of the nictitans*

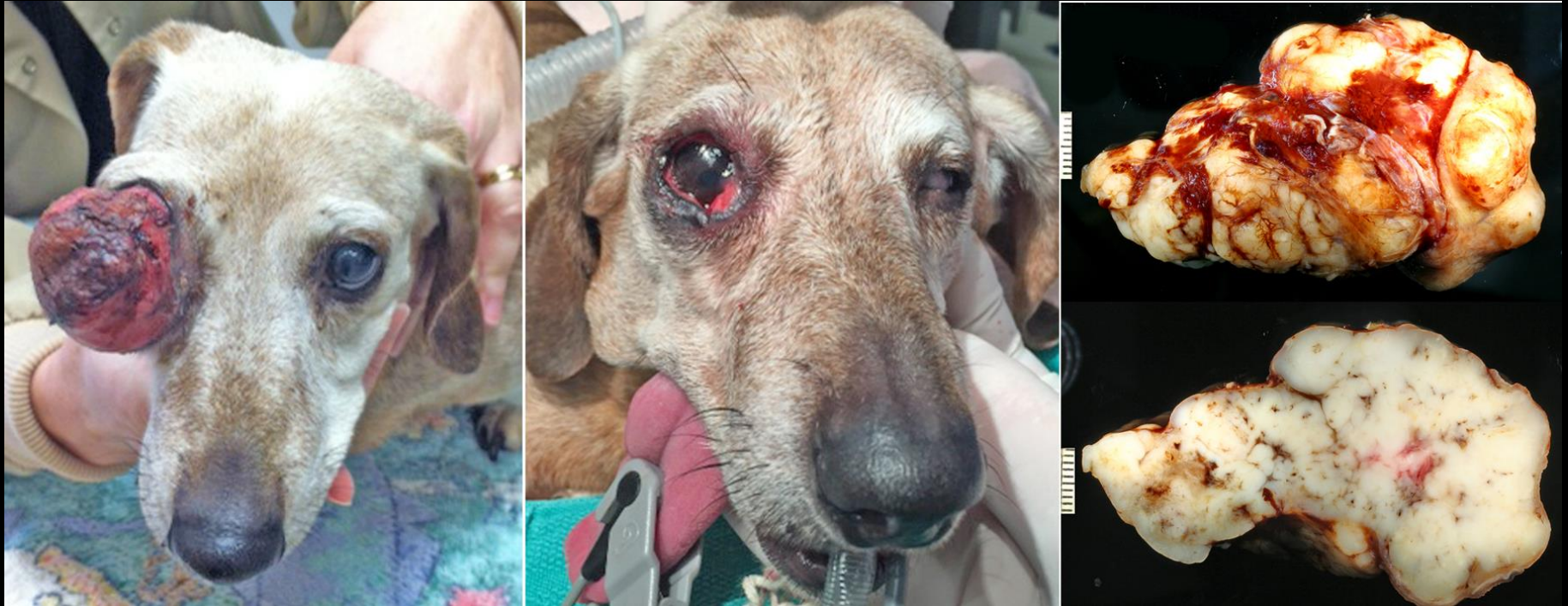


Canine Intrasccleral Hemangioma and Hemangiosarcoma

Rare



Adenocarcinoma of the Gland of the Third Eyelid

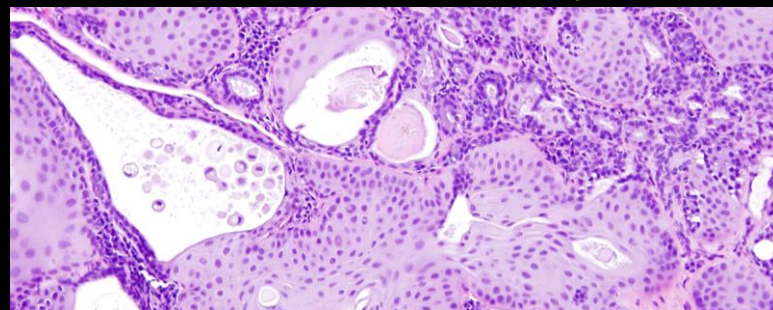
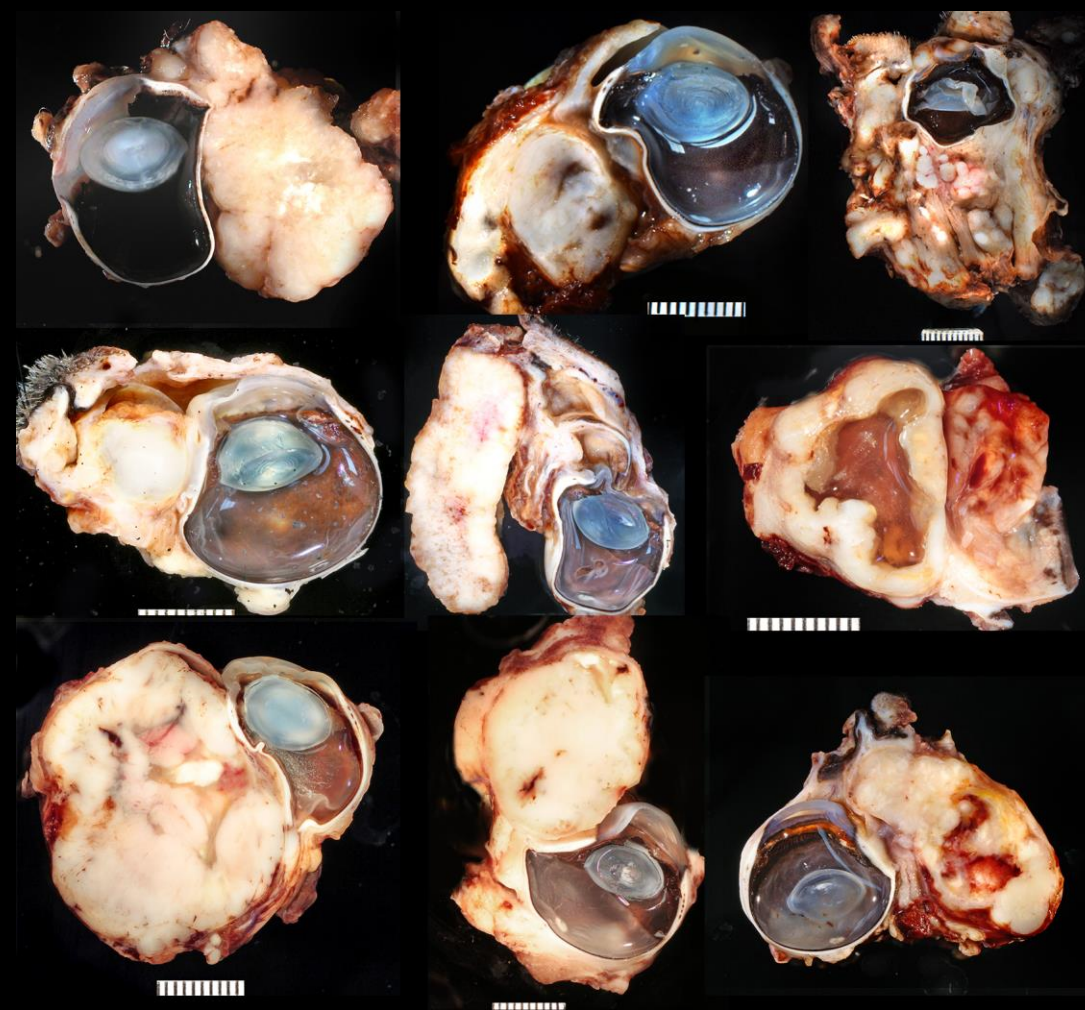


Clinical image from
David Ramsey

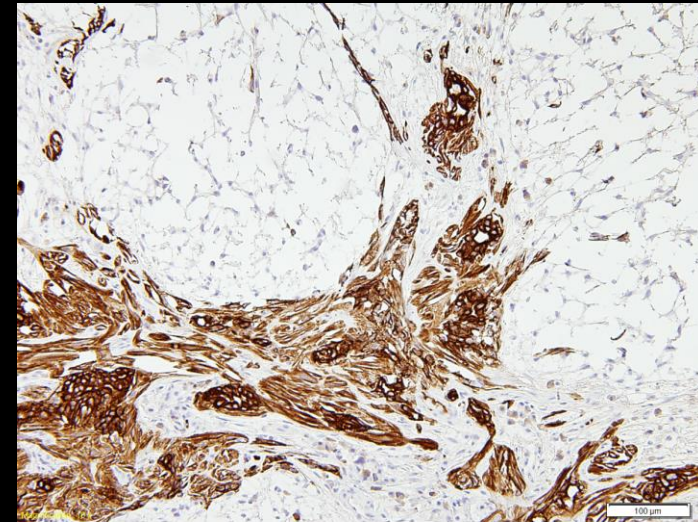
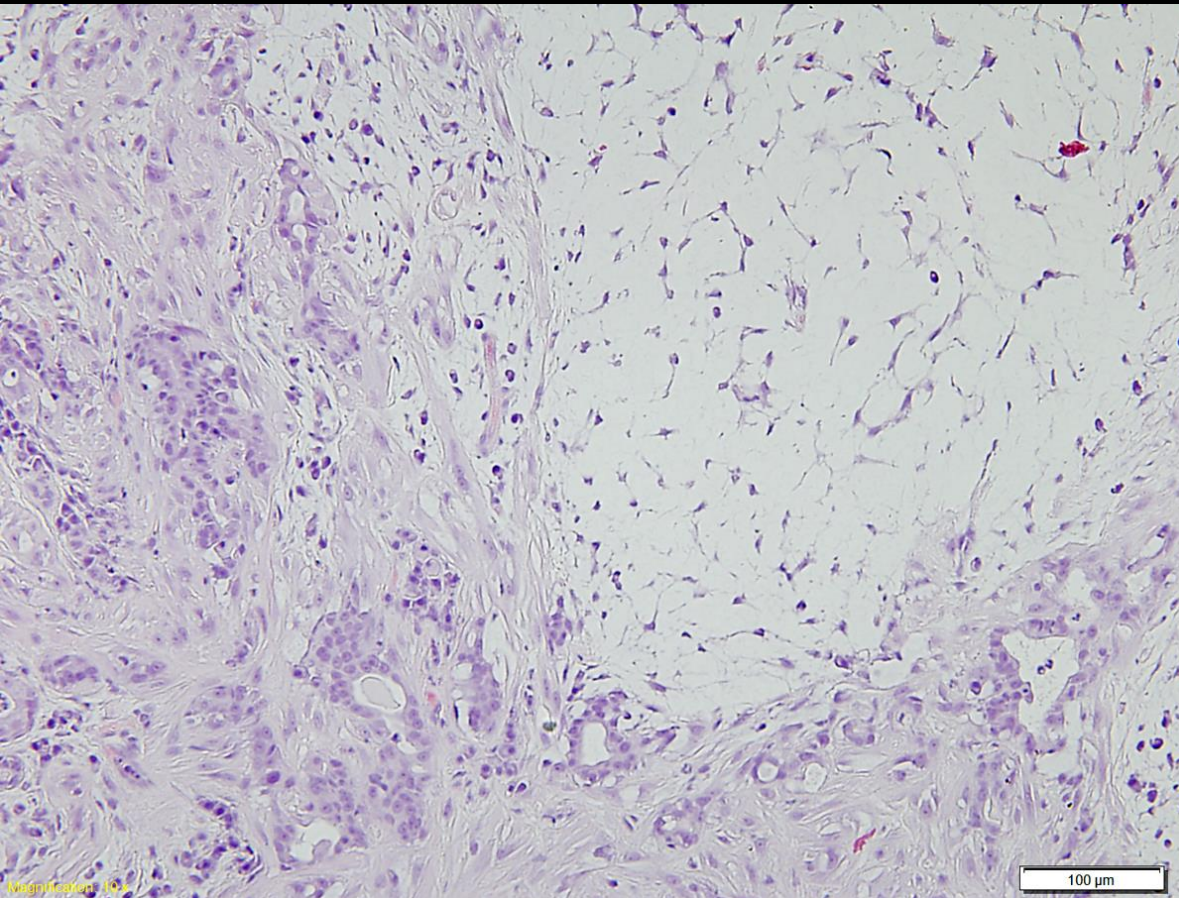
Adenocarcinoma of the Gland of the Third Eyelid

235 cases

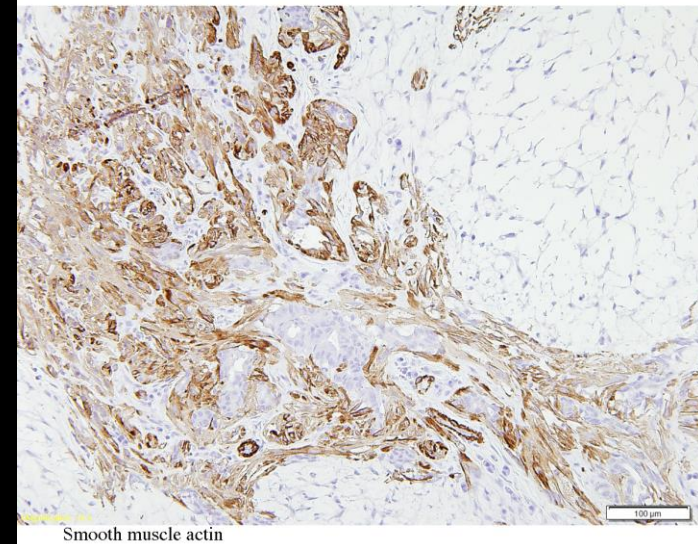
7.6% *Dachshund* (1.5% of total)



Adenocarcinoma of the Gland of the Third Eyelid



Cytokeratin

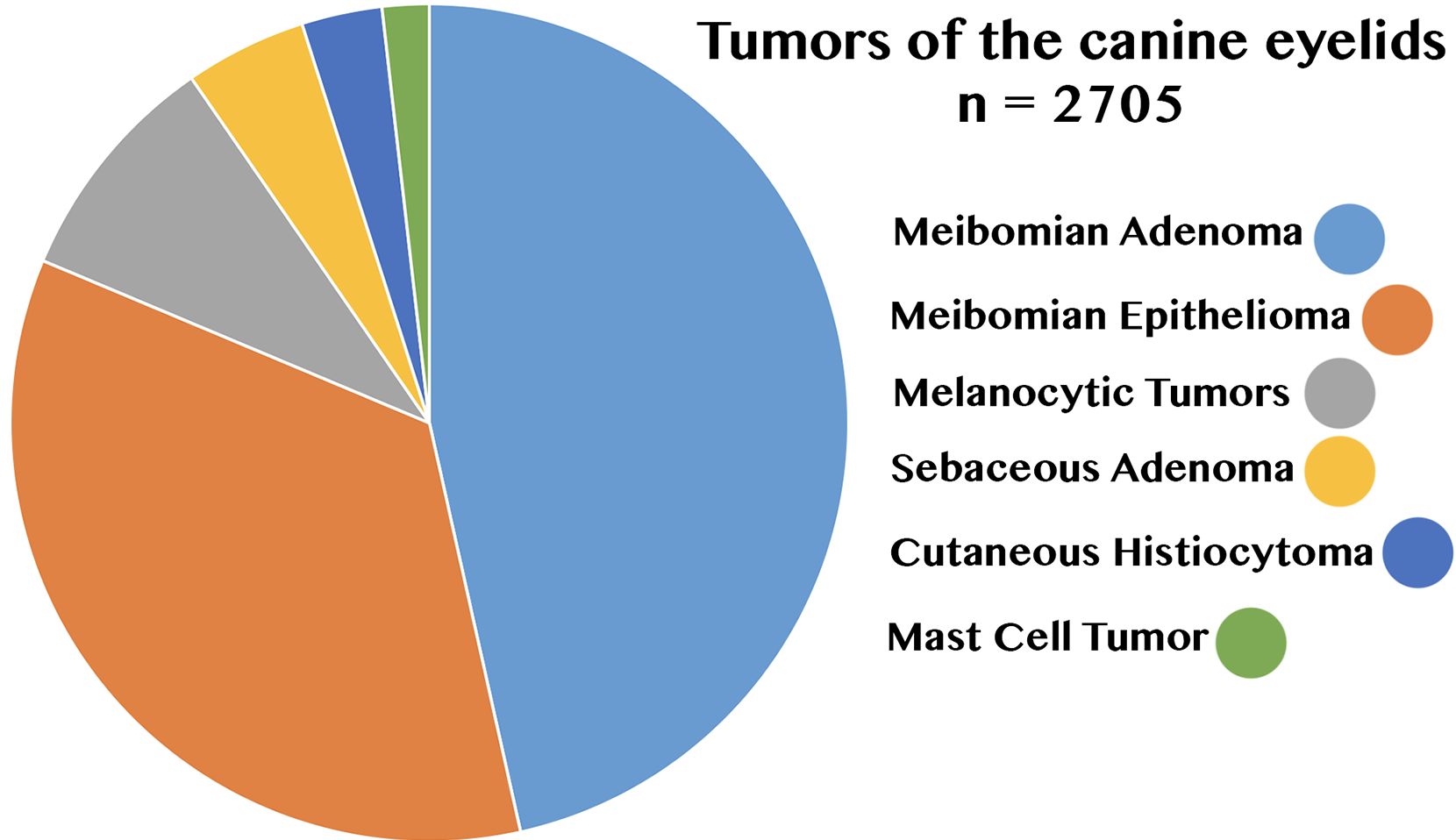


Smooth muscle actin

***Complex or Mixed tumors
are seen***

Tumors of the Canine Eyelid

**Tumors of the canine eyelids
n = 2705**



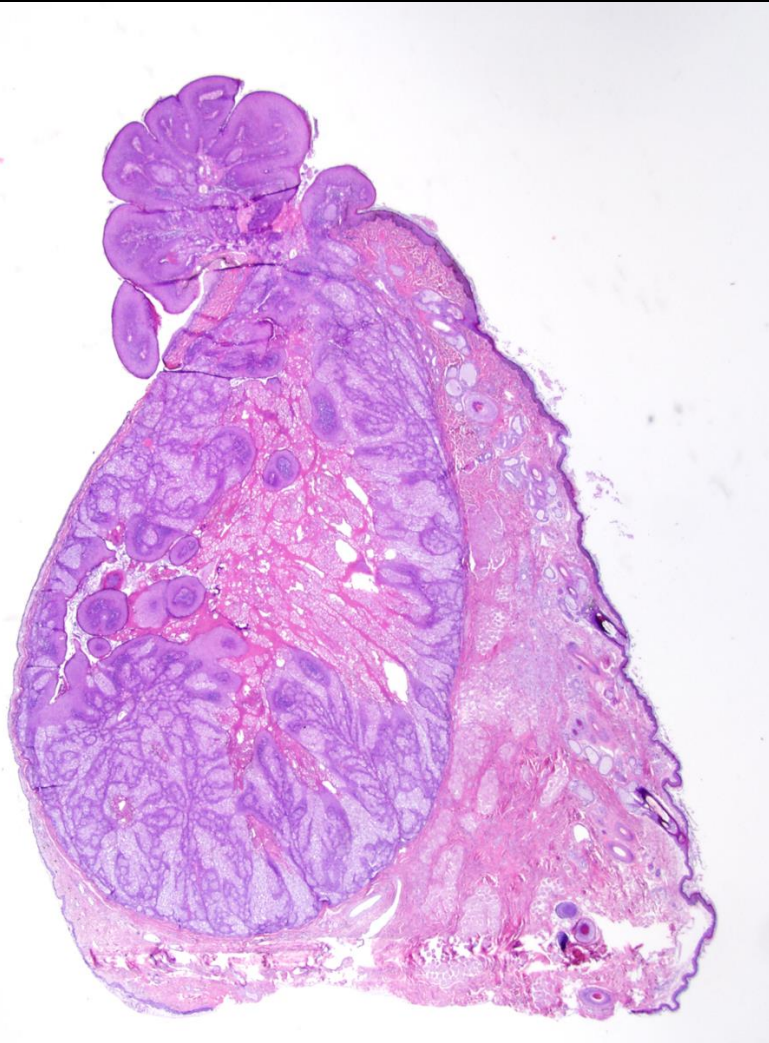
Tumors of the Meibomian Gland

(Numbers from 2012)

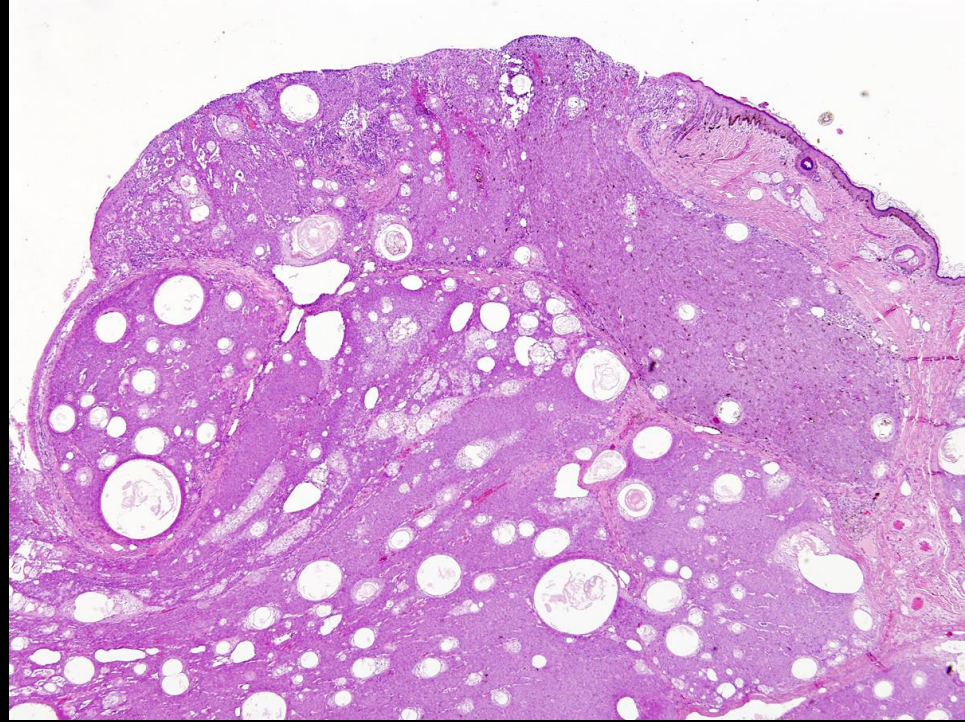
- 1207 cases in the COPLOW database
 - 233 Mixed breed
 - **222 Labrador Retriever**
 - 91 Golden Retriever
 - 66 Cocker Spaniel
 - 47 Shih Tzu



Tumors of the Meibomian Gland



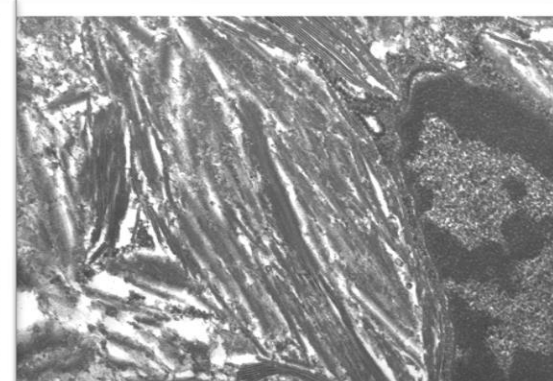
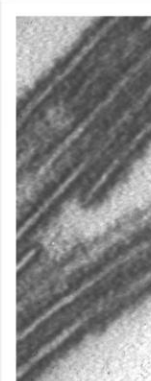
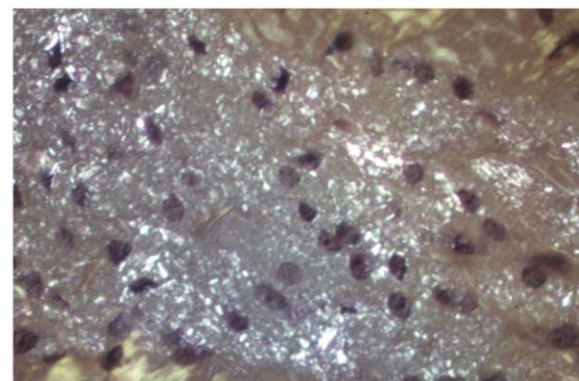
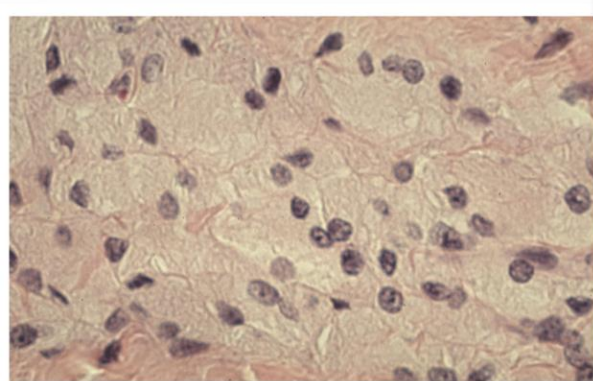
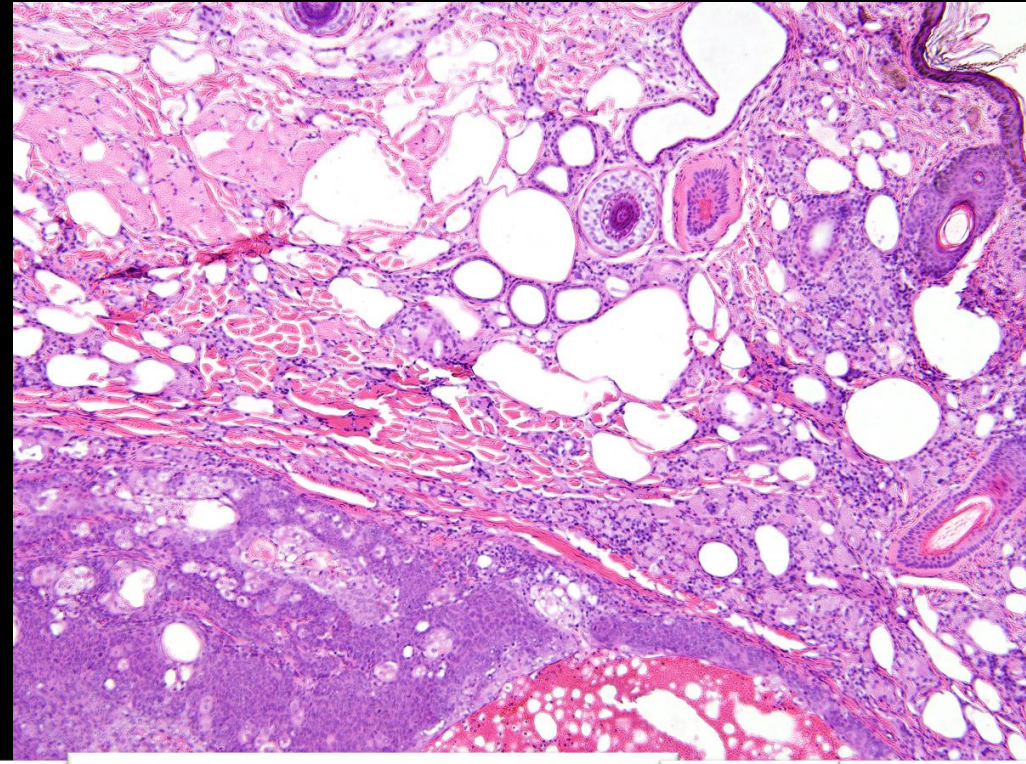
Adenoma: 648 cases



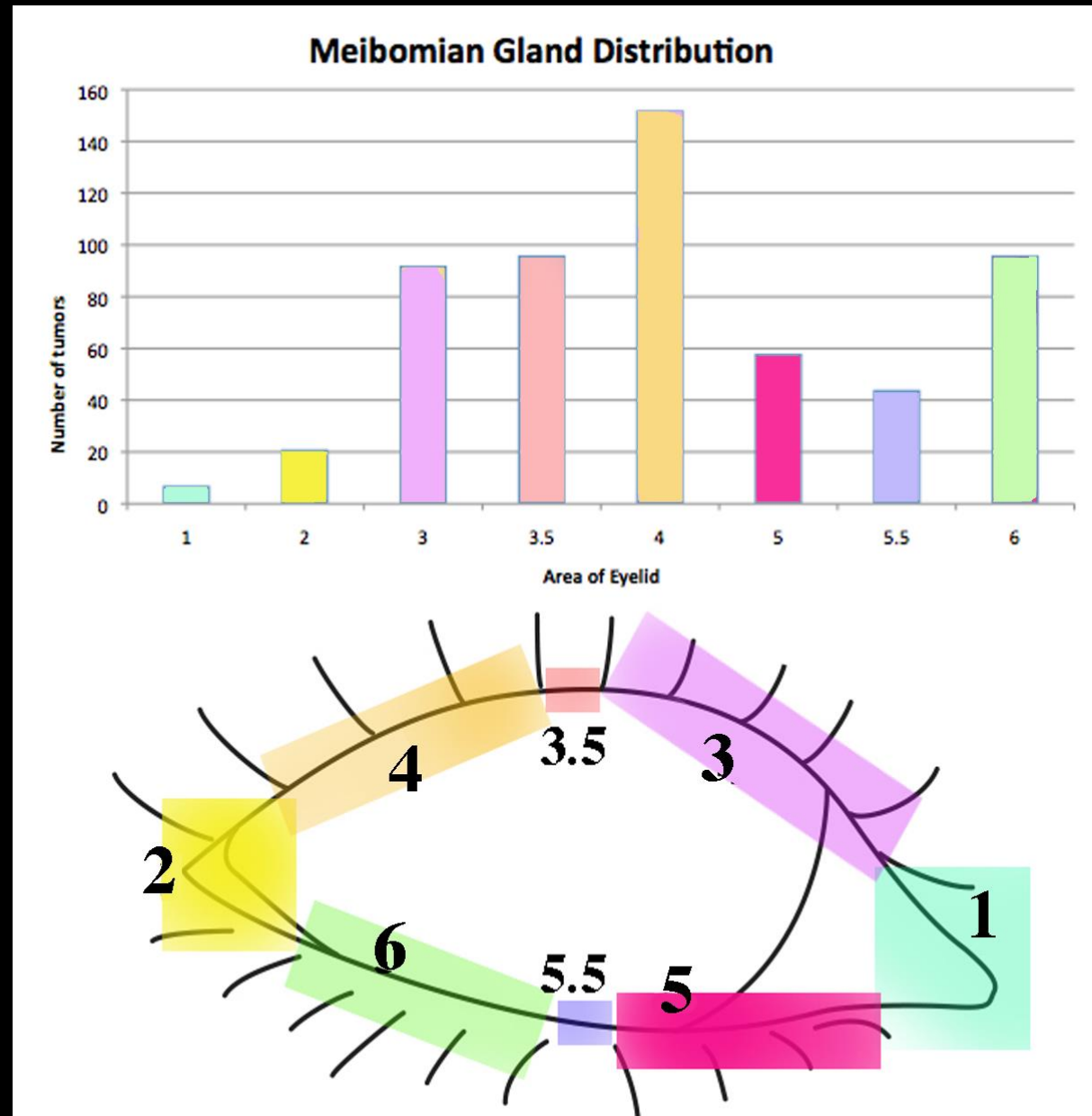
Epithelioma: 576 cases

Tumors of the Meibomian Gland

Lipogranuloma



Tumors of the Meibomian Gland

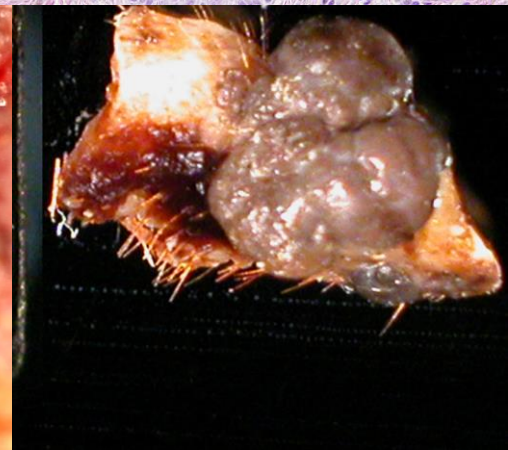
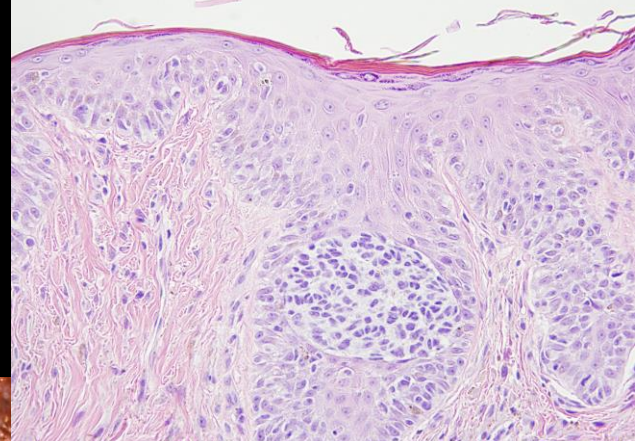
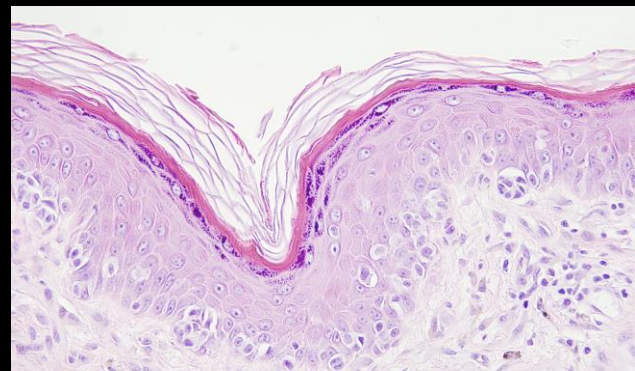


**Distribution
of meibomian
gland tumors**

Eyelid Melanocytic Tumors

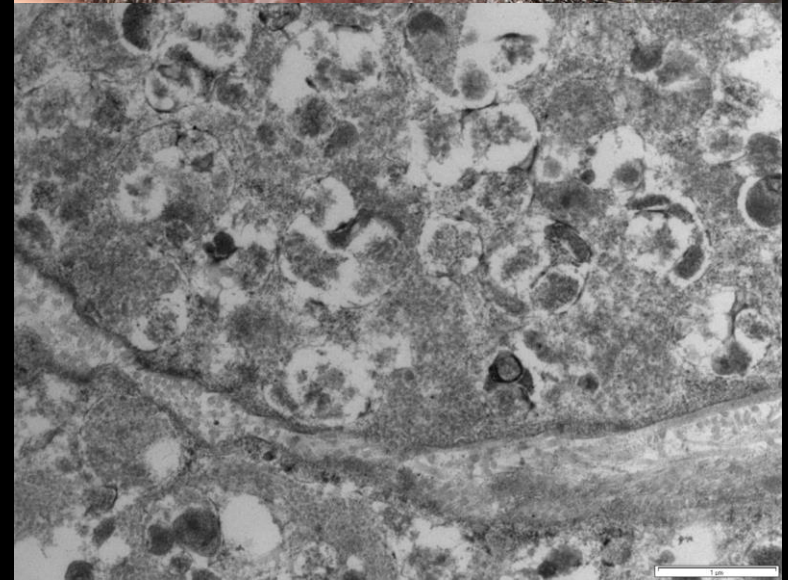
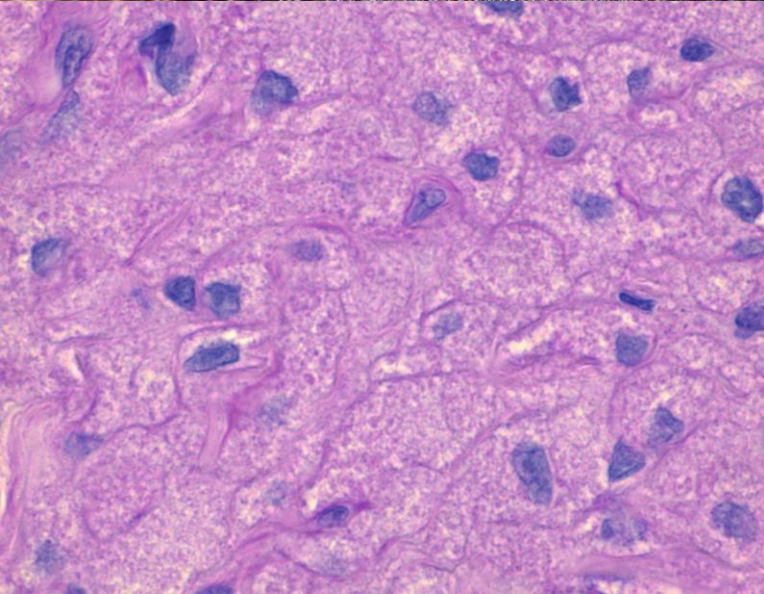
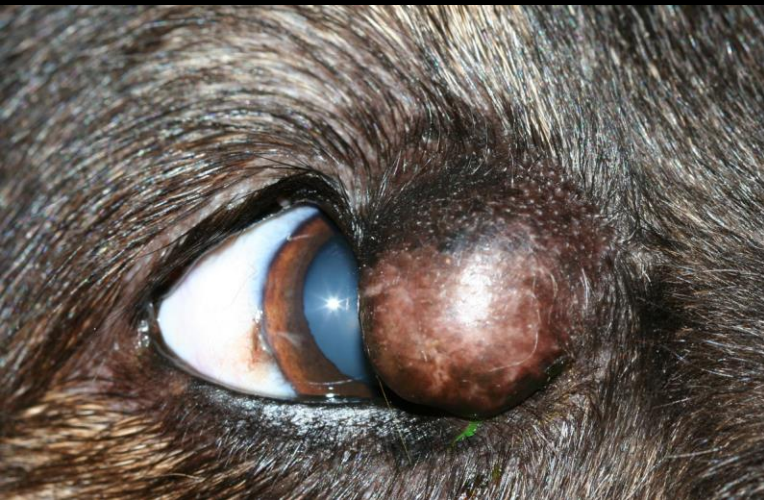
usually melanocytoma

- 39 Cases in the COPLOW database
 - 7 Mixed breed
 - 6 Vizsla
 - 4 Golden Retriever
 - 3 Yorkshire Terrier
 - 3 Doberman (White)



Eyelid Granular Cell Tumors: 16 cases

Medial Canthus



Mast Cell Tumors

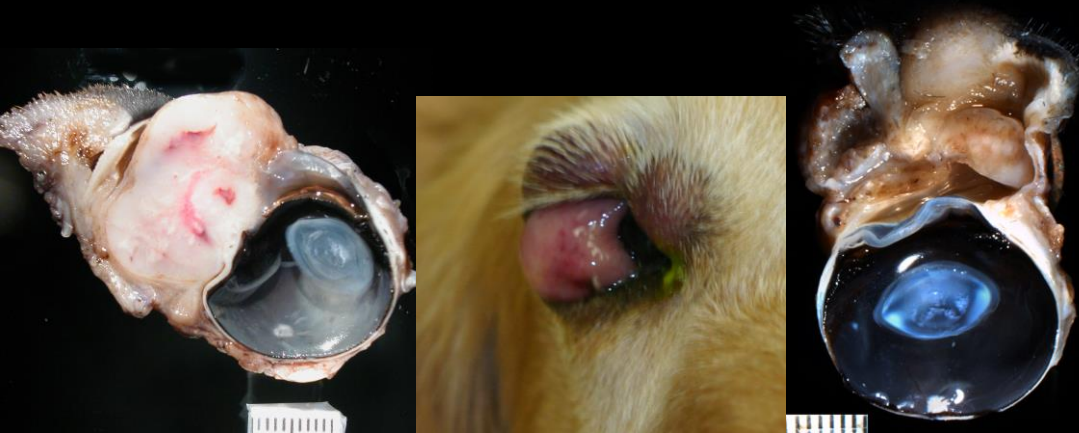
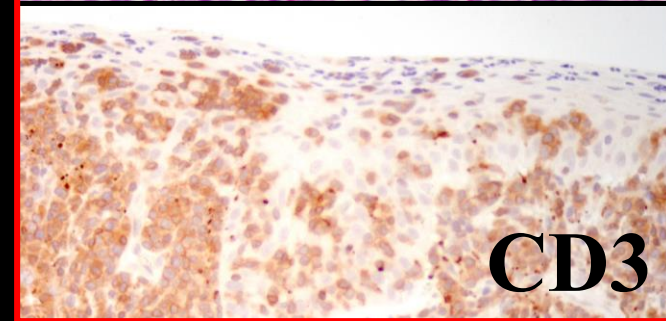
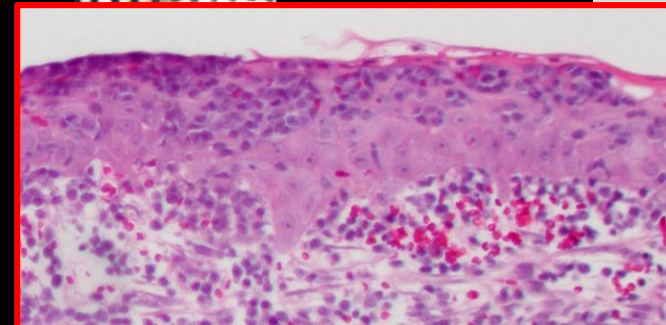
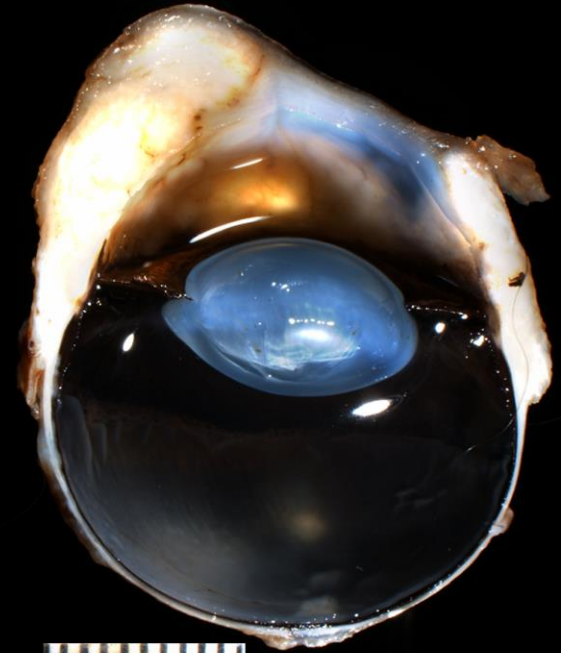
- 175 Mast Cell Tumors in the COPLOW database
 - 80 cases are conjunctival
 - 16 Mixed breed
 - 18 Labrador Retriever
 - 10 Golden Retriever
- Conjunctival tumors have a better prognosis than expected
- Grading systems are unproven in the conjunctiva



Conjunctival Lymphoma

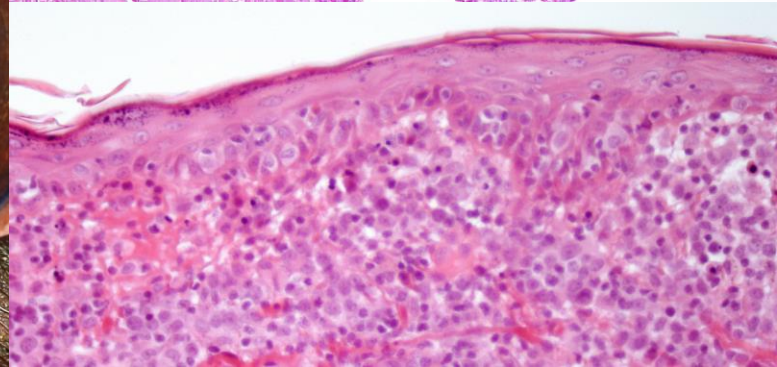
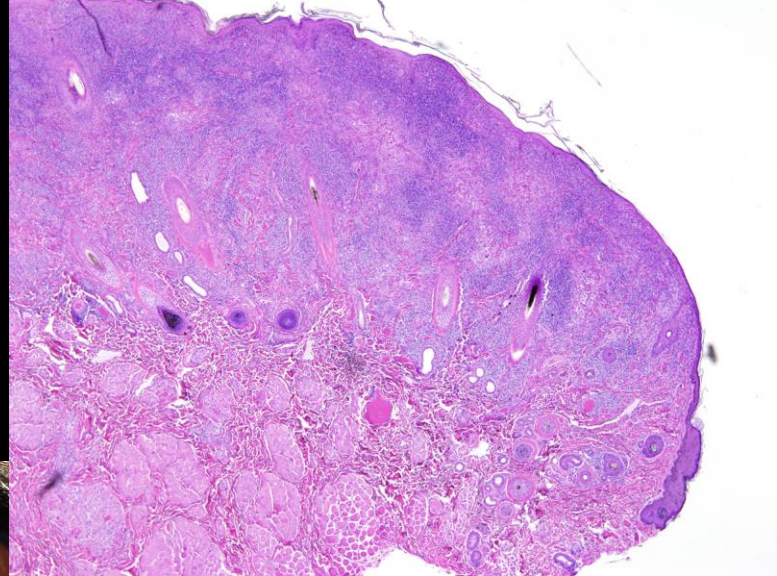
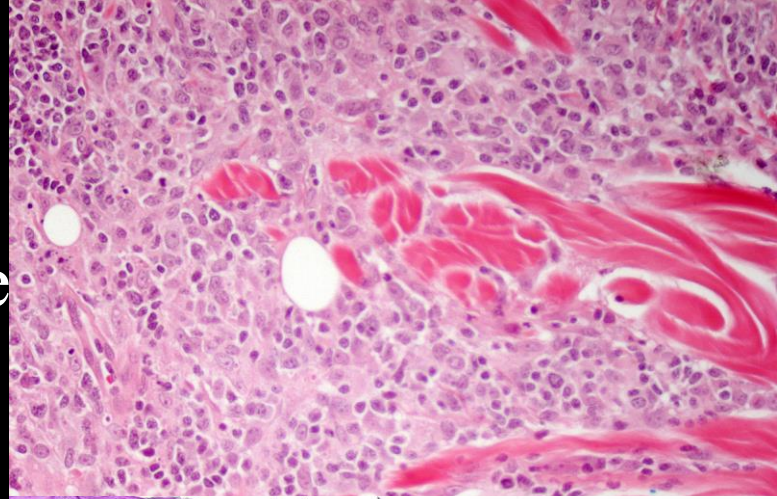
(Numbers from 2012)

- 30 cases in the COPLOW database
 - 5 Mixed breed
 - 6 Golden Retriever
 - 5 Labrador Retriever
 - 3 Boxer
- 9 cases of epitheliotropic T-cell lymphoma
- 18 left eye and 7 right eye



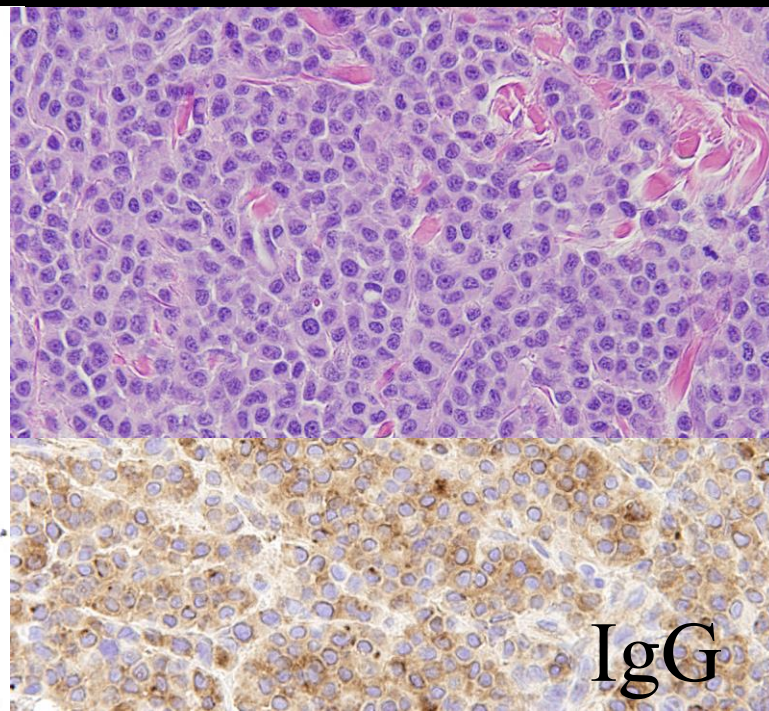
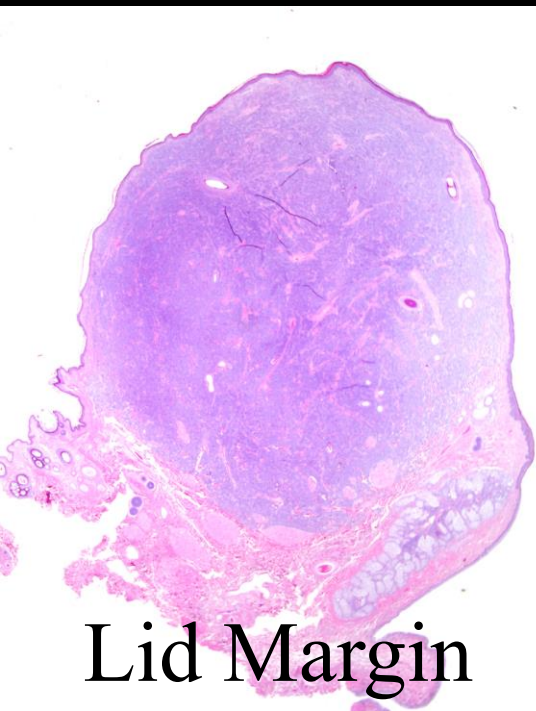
Eyelid Histiocytoma

- 71 cases in the COPLOW database
 - 47/71 less than 6 years-old
- Breeds
 - 11 Mixed breed
 - 10 Labrador Retriever
 - 6 Boxer
 - 4 Bichon Frise
 - 1 Golden Retriever???



Eyelid/Conjunctival Plasmacytoma

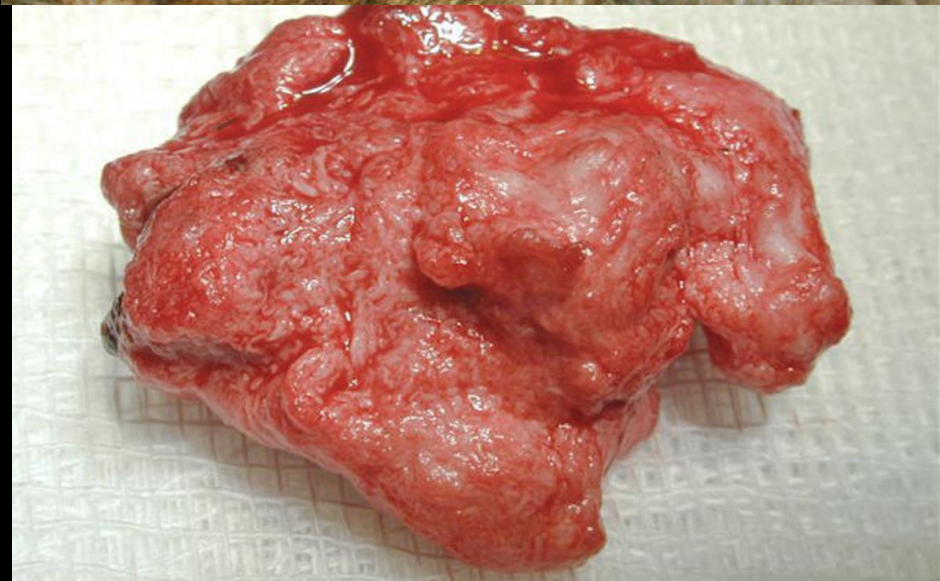
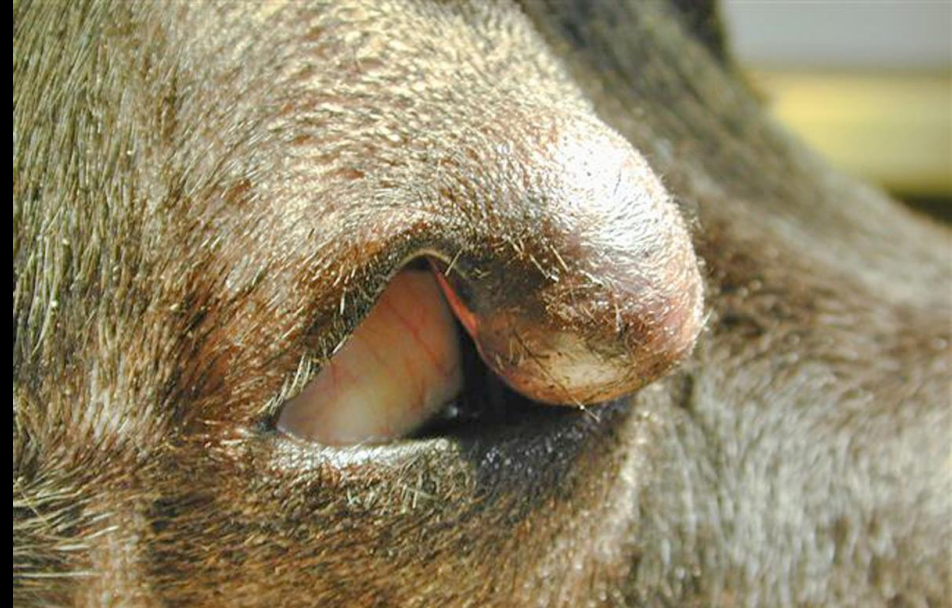
- 39 cases of plasmacytoma in the COPLOW database
- 8 eyelid skin, 5 lid margin and 12 conjunctival



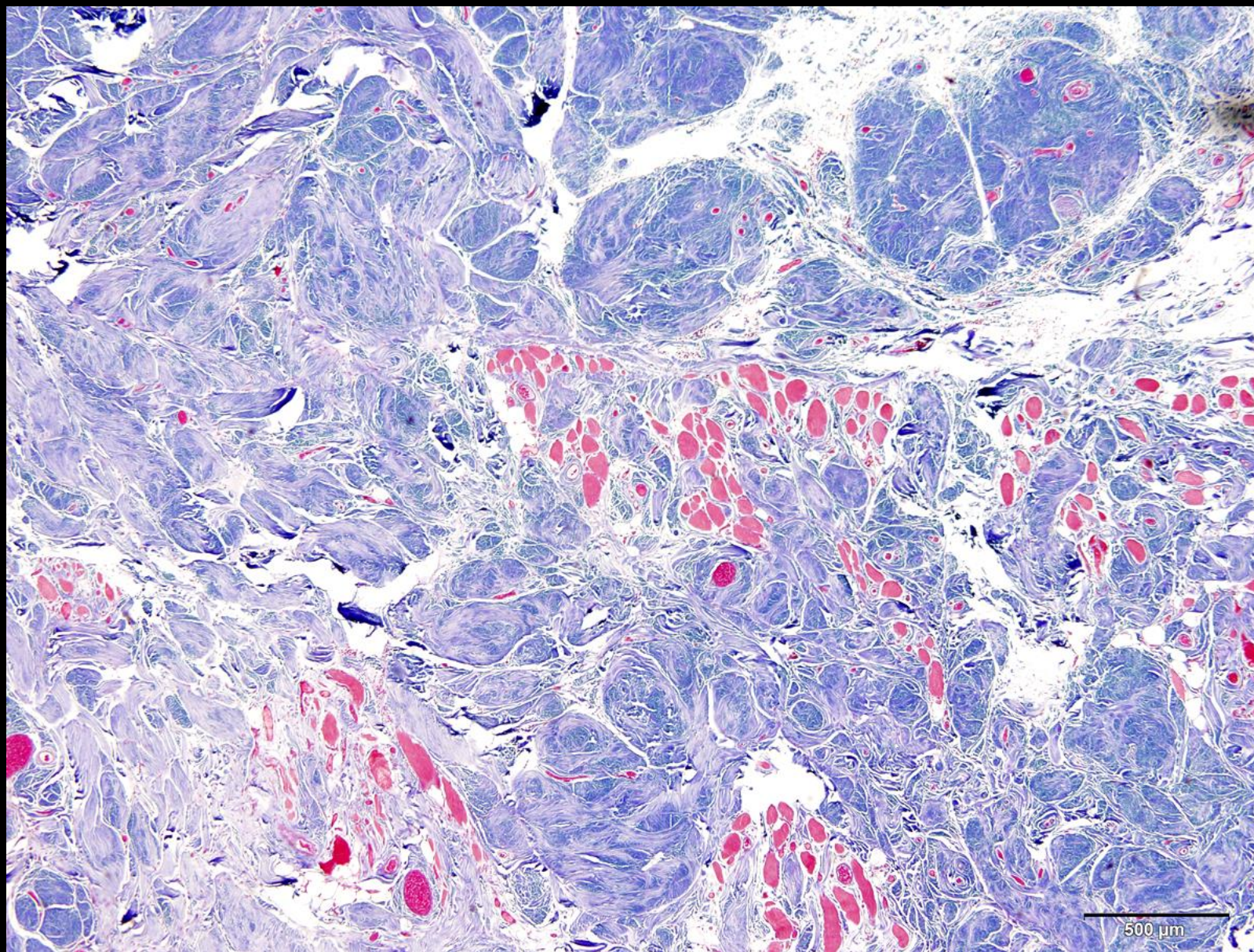
Canine Mesenchymal Hamartoma

- 22 cases
- Almost all at lateral canthus
- Mostly large breed dogs
- 12 OD, 6 OS, 1 OU

1	1 mixed breed
1	Alaskan husky
2	basset hound
1	boxer
1	Doberman pinscher
1	English cocker spaniel
1	German shepherd
1	giant schnauzer
3	golden retriever
1	Jack Russell terrier
2	Labrador retriever
1	munsterlander
3	rottweiler
1	Staffordshire terrier
1	weimaraner
1	Wheaten terrier

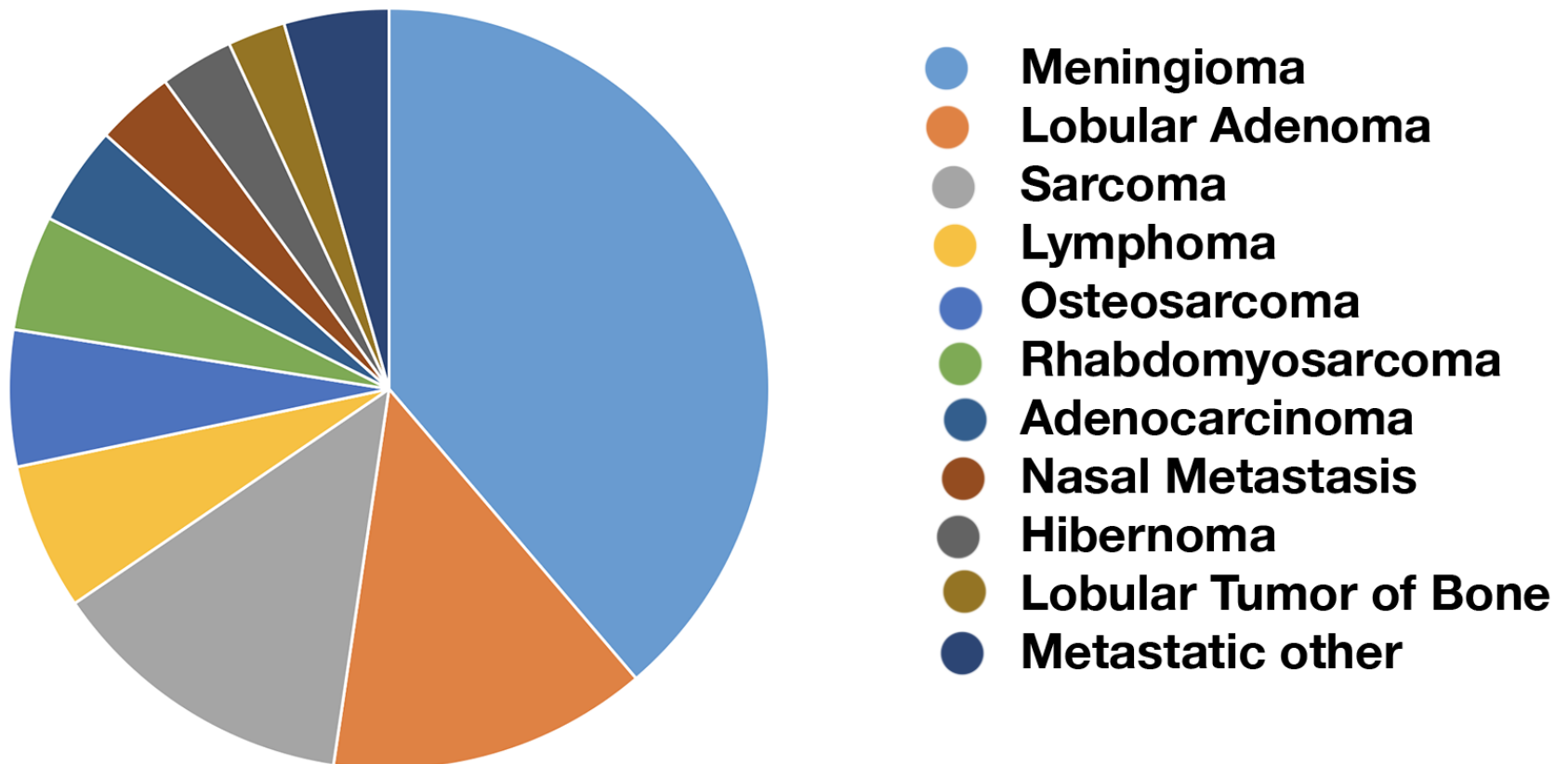


Canine Mesenchymal Hamartoma



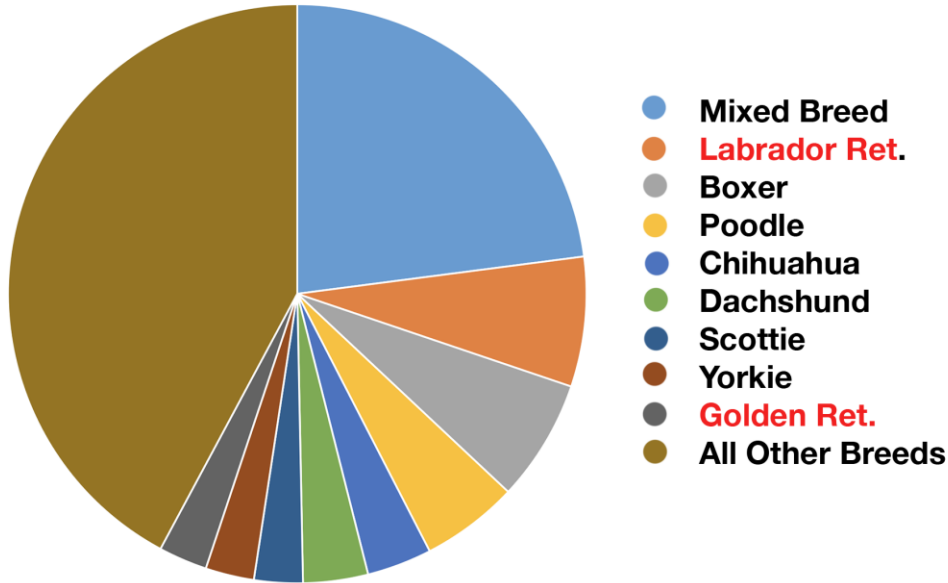
Canine Tumors of the Orbit

Canine Orbital Neoplasia
n = 400



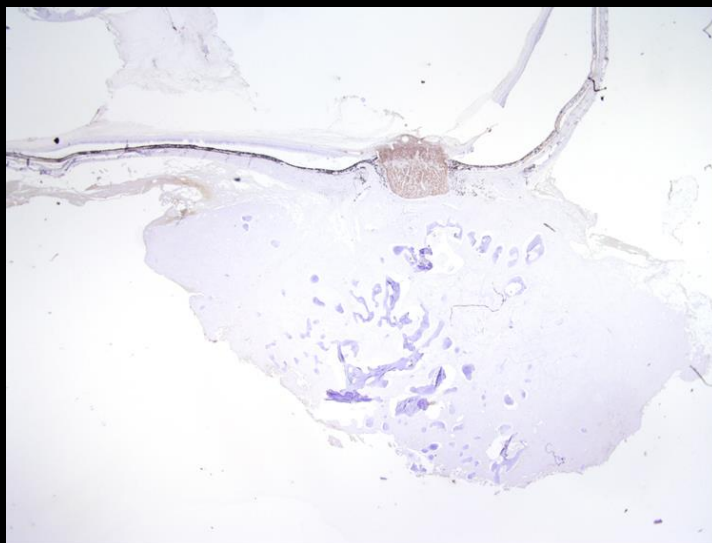
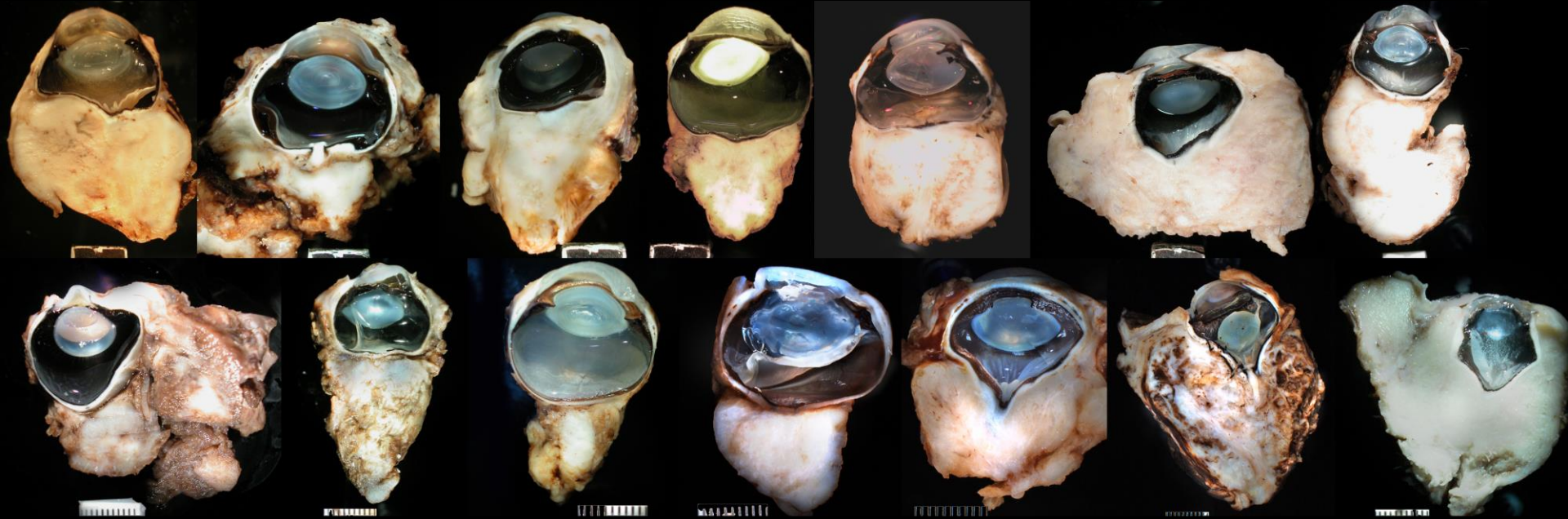
Canine Orbital Meningioma

Orbital Meningioma
n = 174

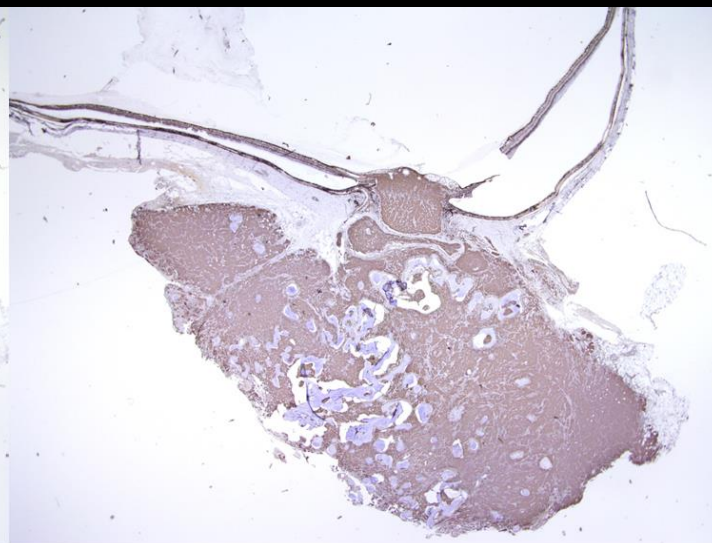


- The tumor surrounds the nerve in a conical manner
- Slow growing, eventually grows into cavernum
- Metaplastic bone, cartilage or myxoid tissue
- 66 left eye vs 44 right eye
- 62 males vs 56 females

Canine Orbital Meningioma

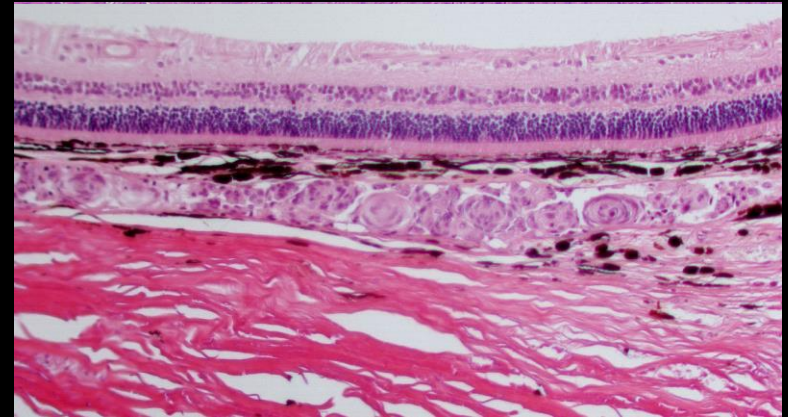
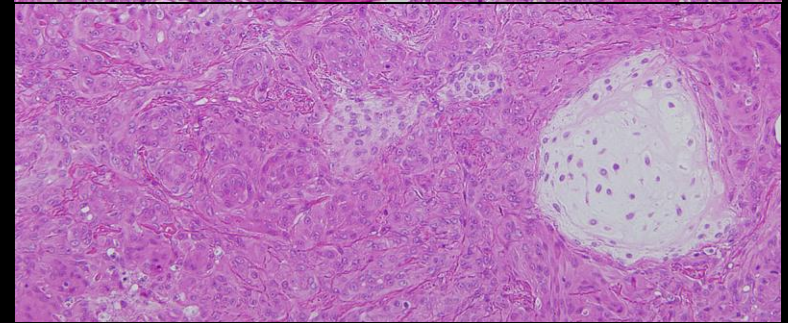
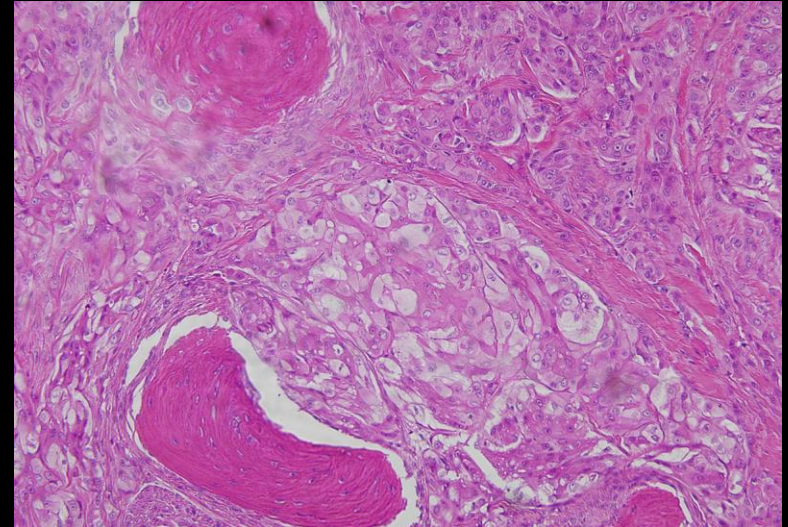
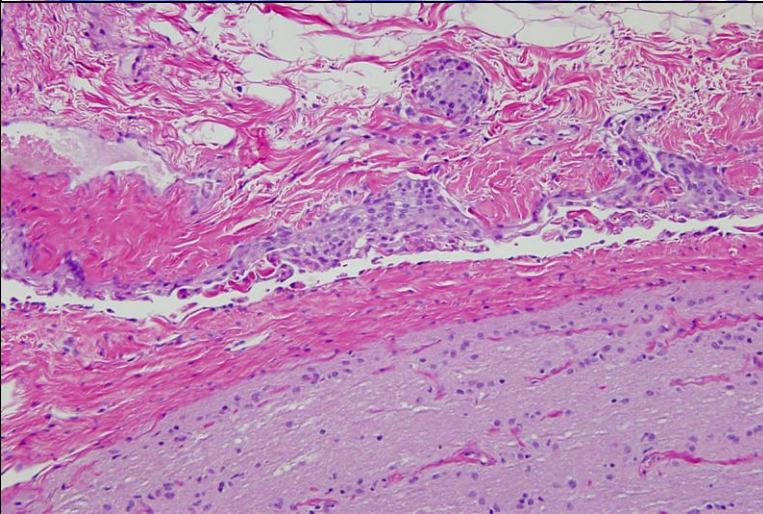
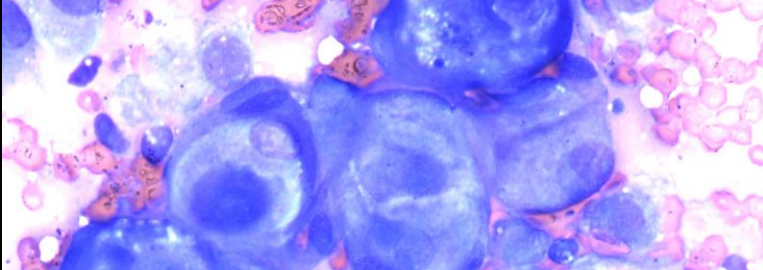
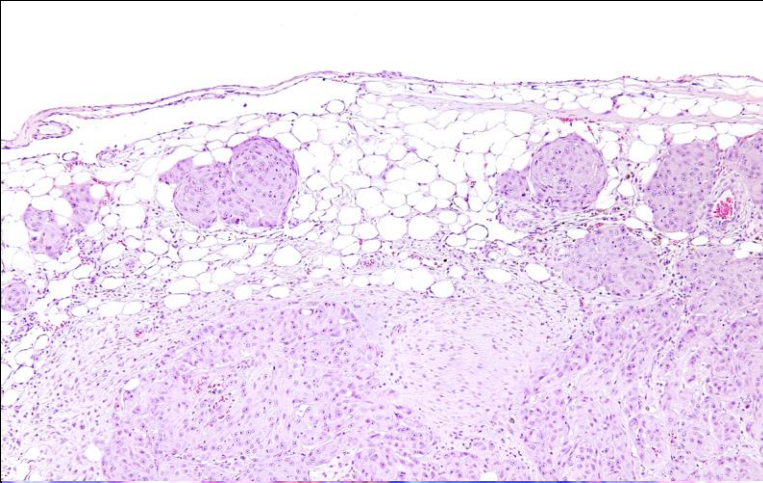


Cytokeratin

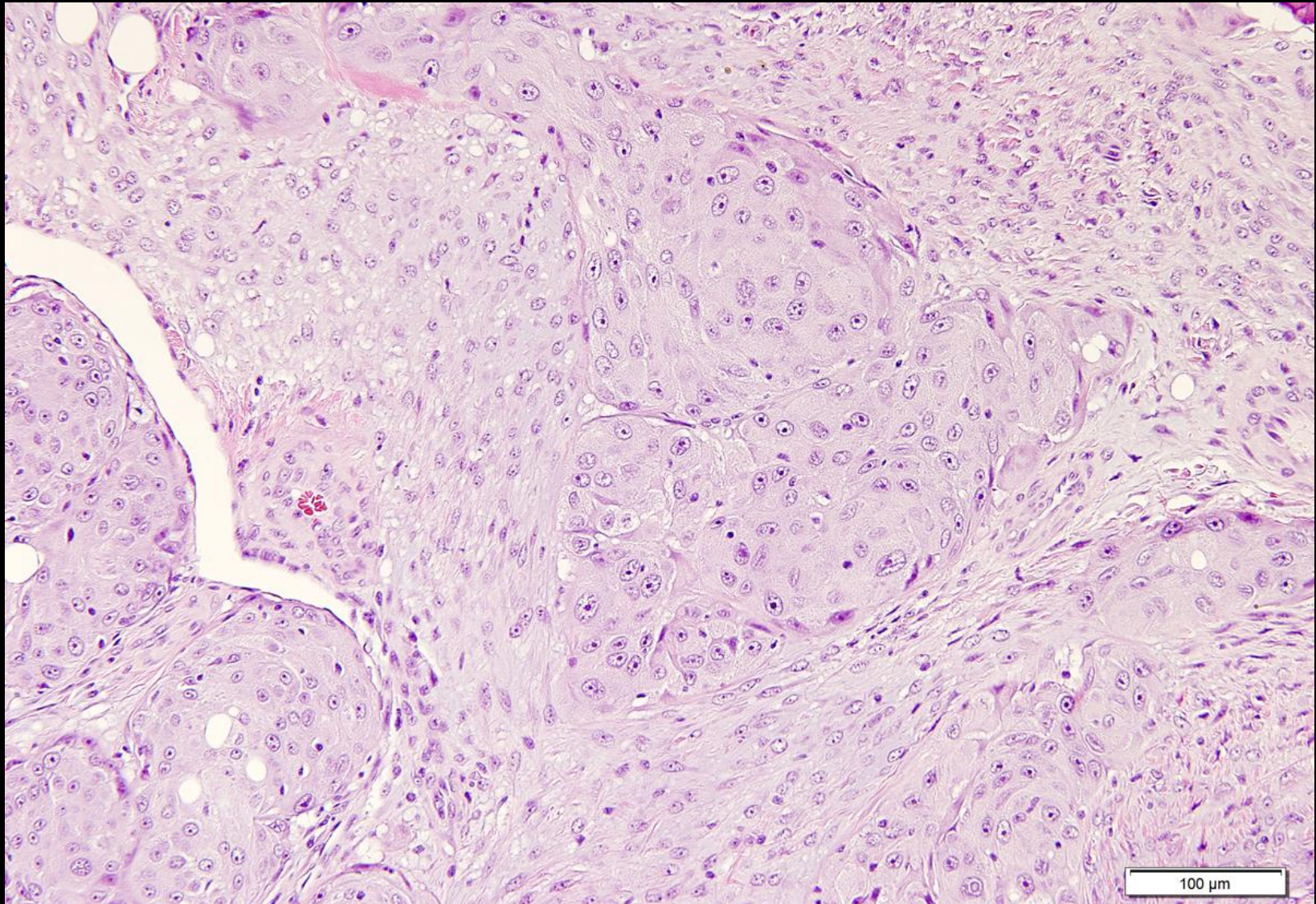


Vimentin

Canine Orbital Meningioma



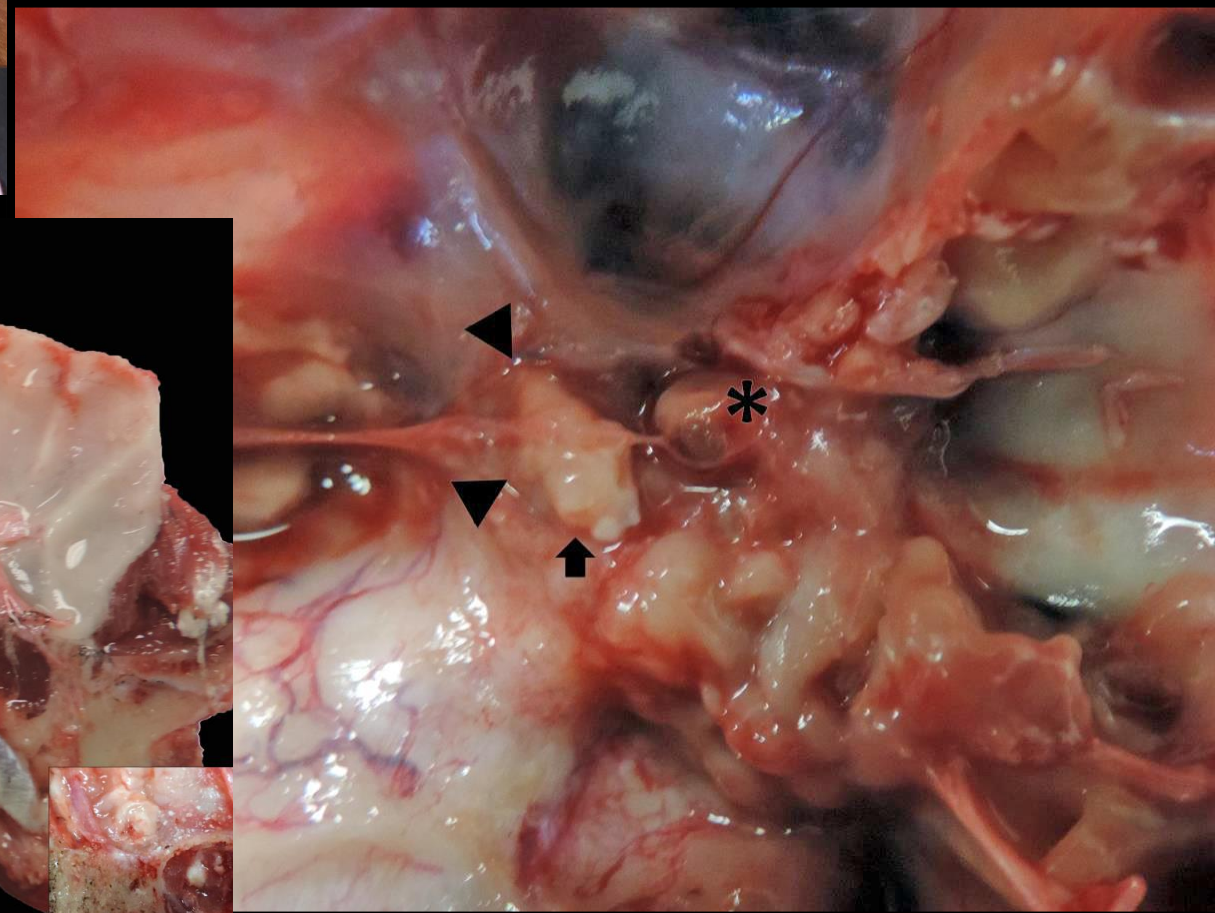
Canine Orbital Meningioma



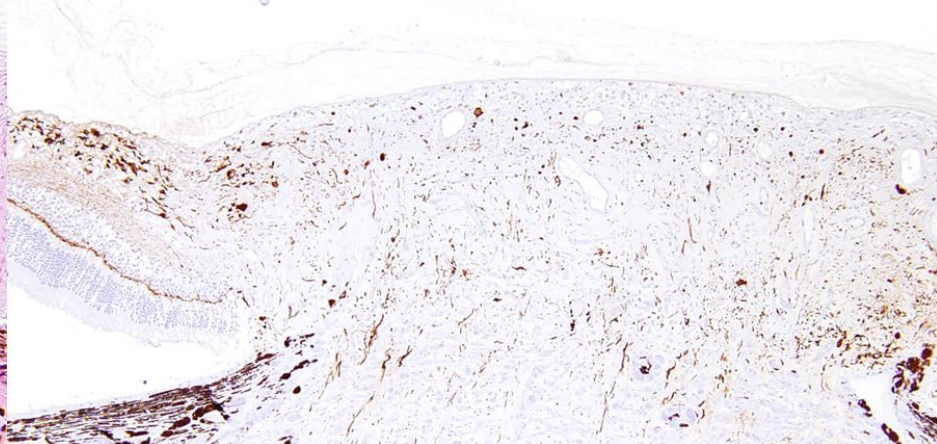
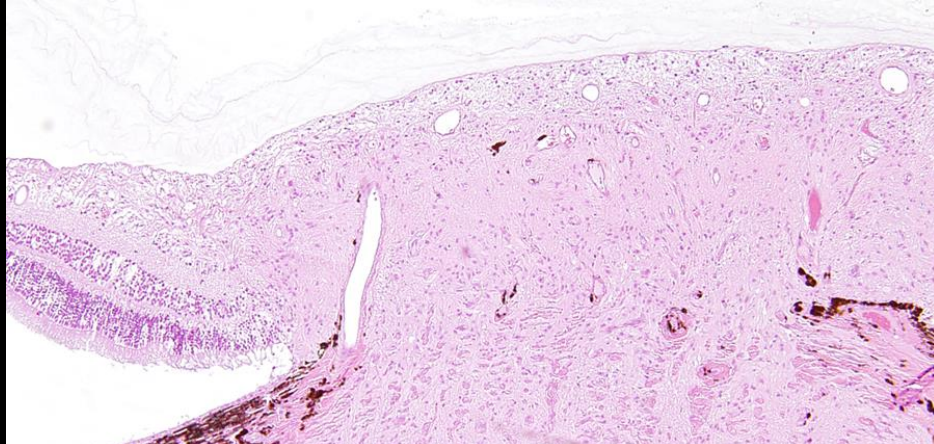
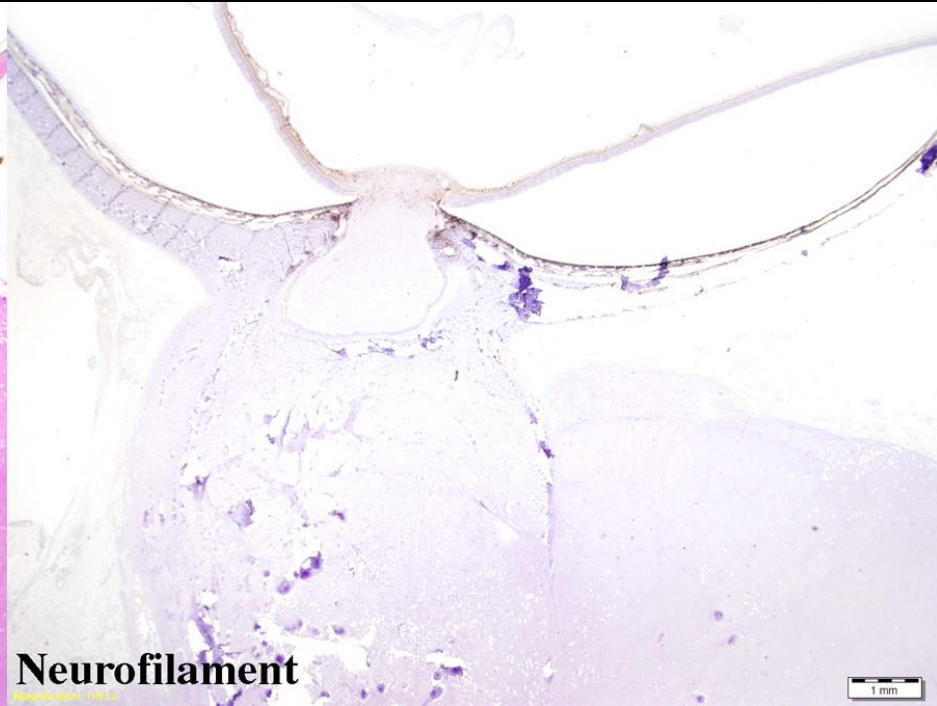
Epithelial Appearance Histologically

Canine Orbital Meningioma

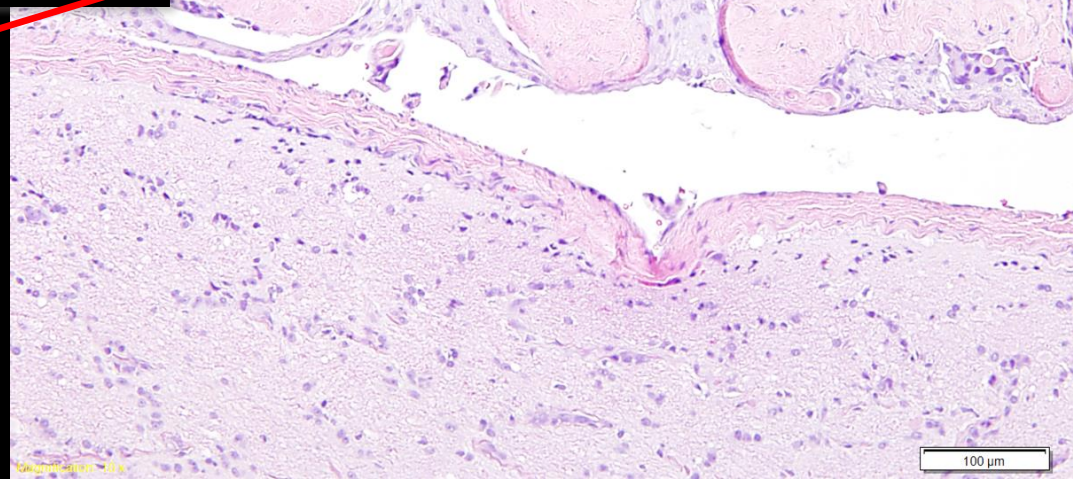
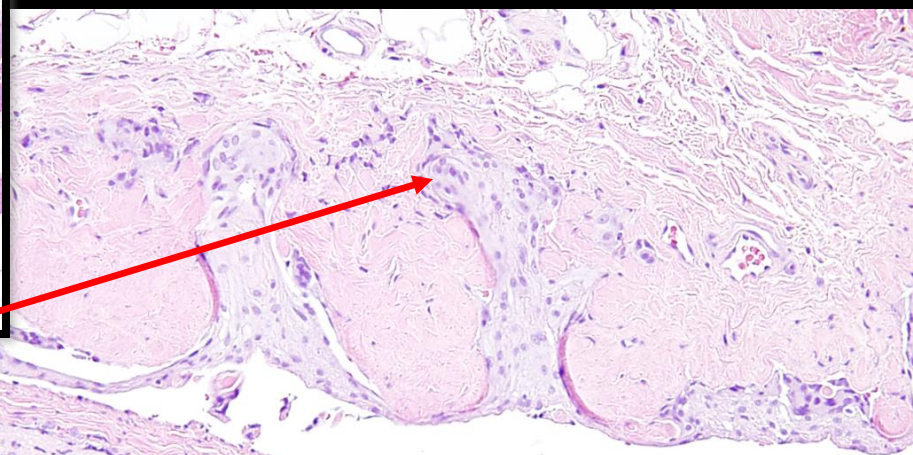
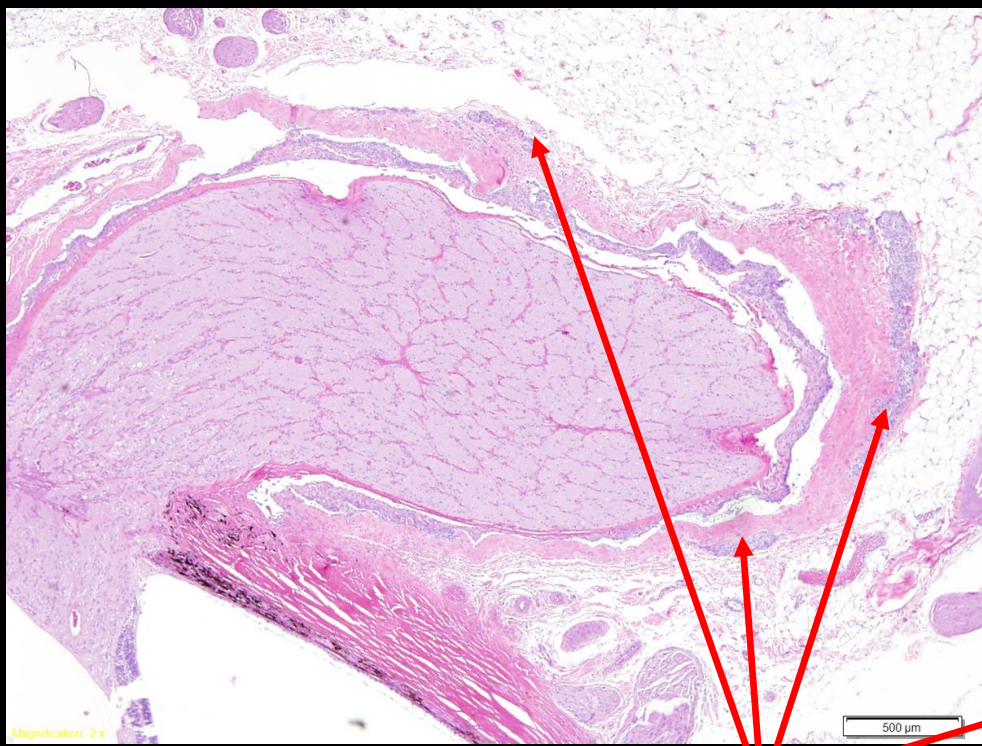
Recurrent tumor growing into the calvarium 4.5 years after enucleation



Canine Orbital Meningioma



Canine Orbital Meningioma



Arachnoid Cap Cells

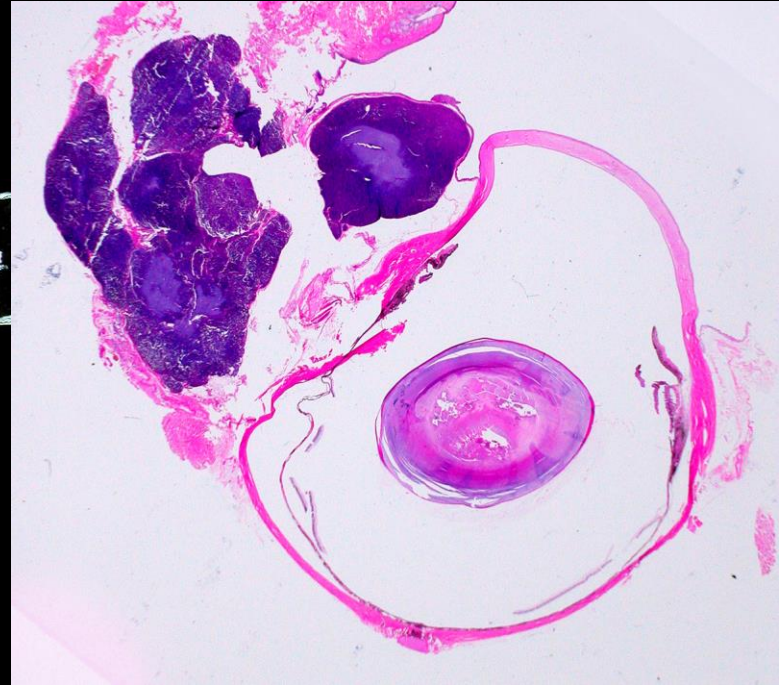
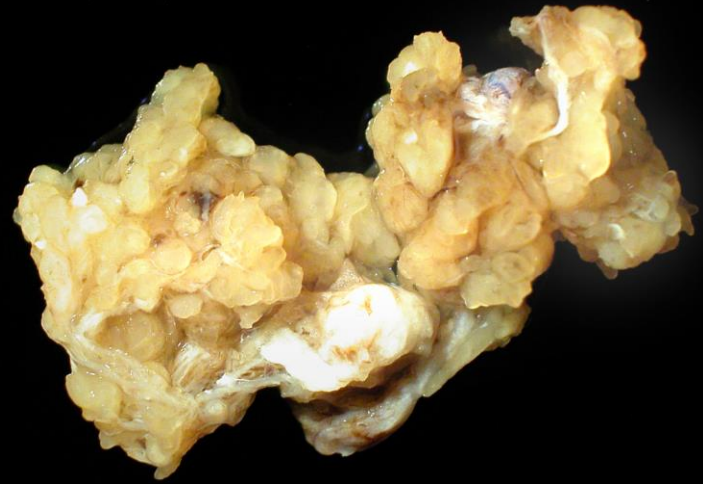
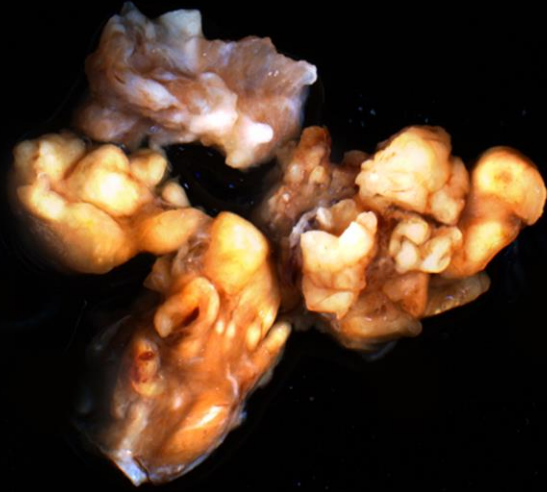
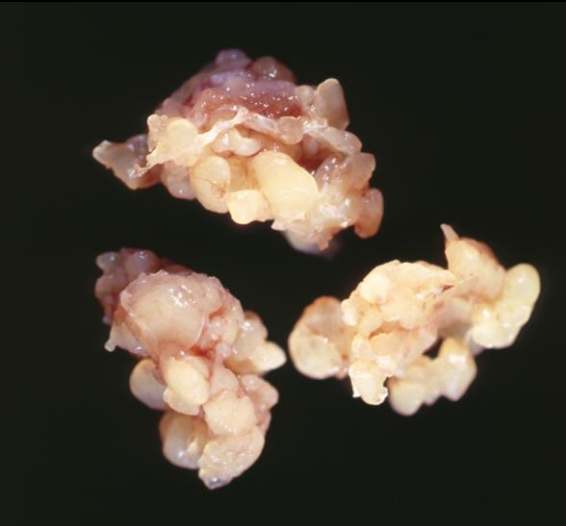
Canine Orbital Lobular Adenoma

- 56 cases in the COPLOW database
 - 15 Labrador Retriever
- Many dogs with bilateral disease
- Most cases recur in one to two years because it is difficult to remove

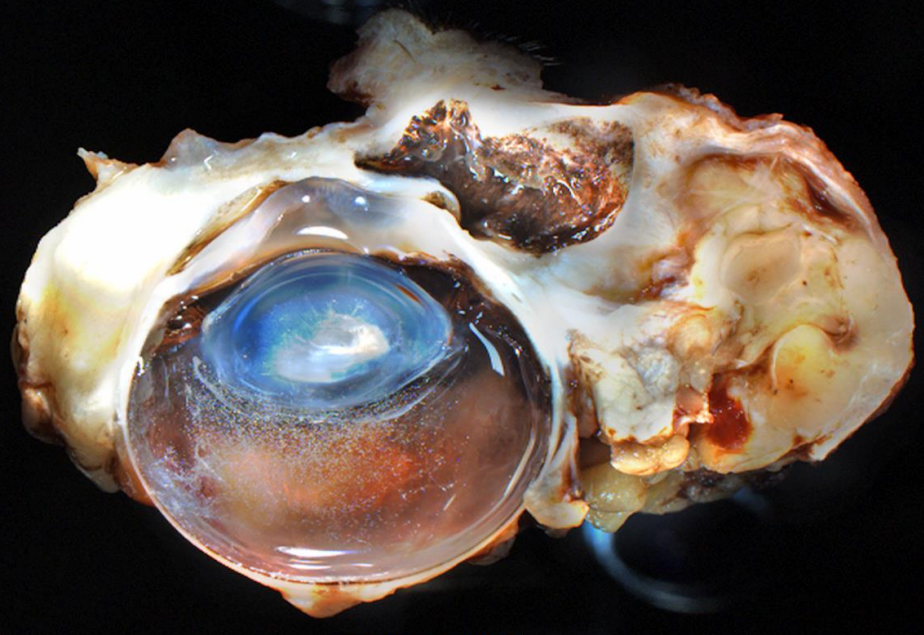
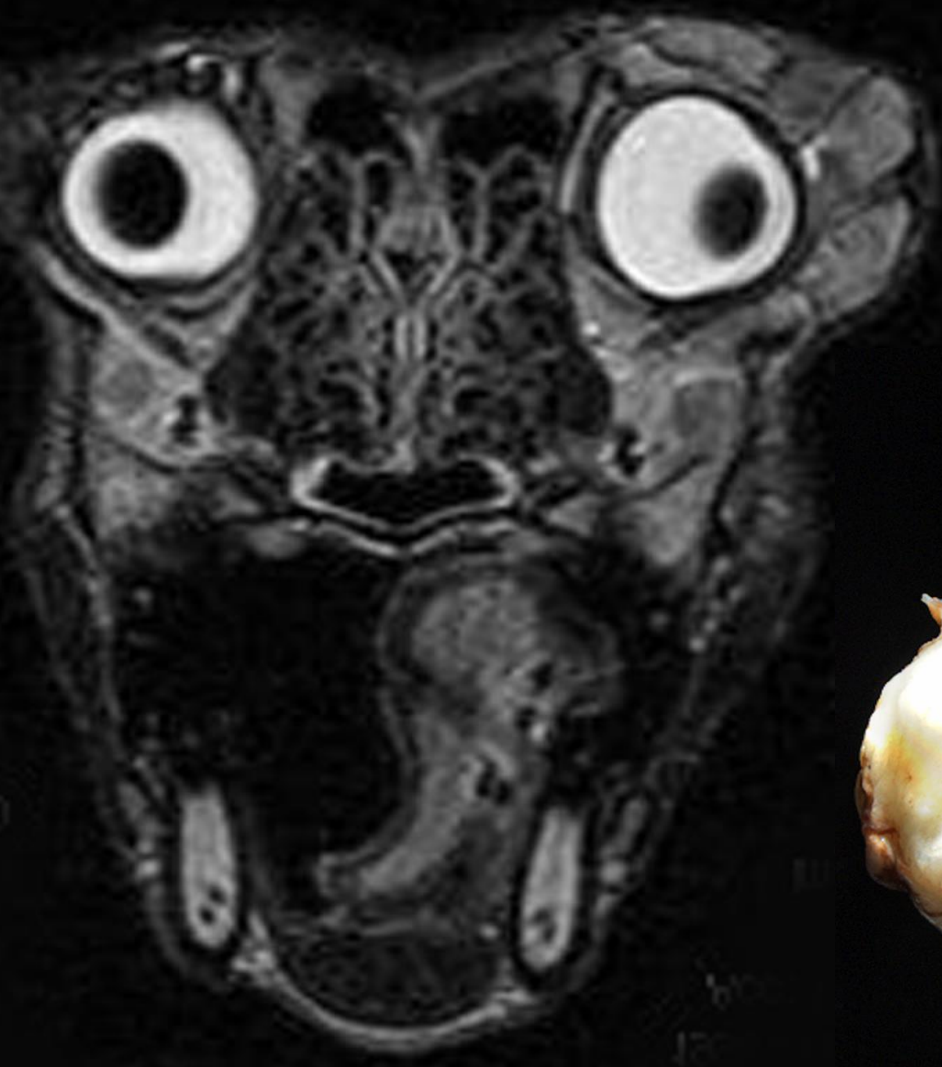


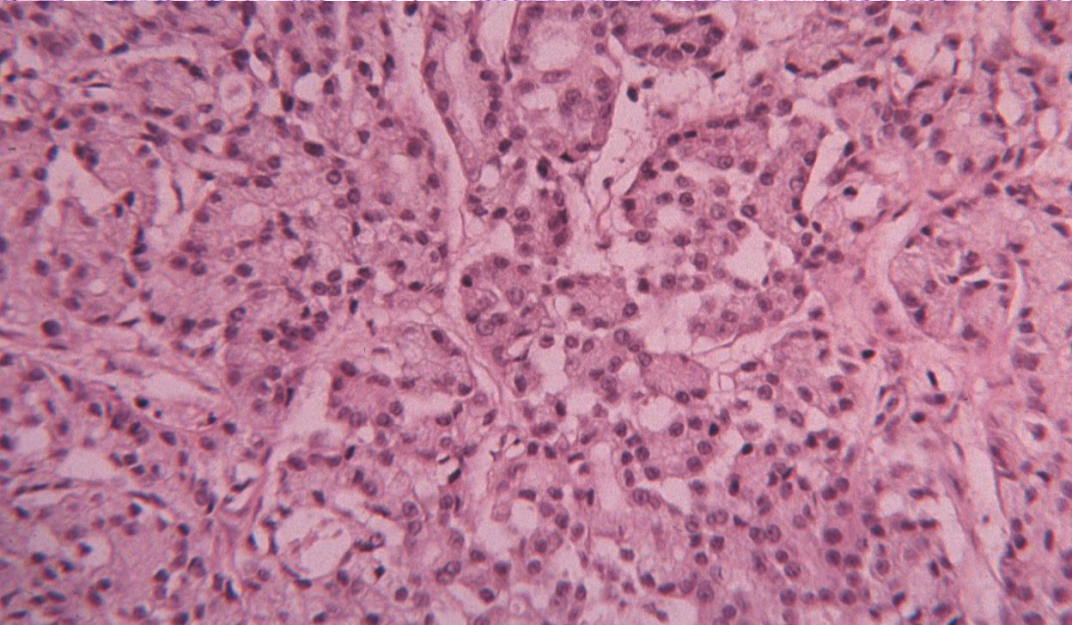
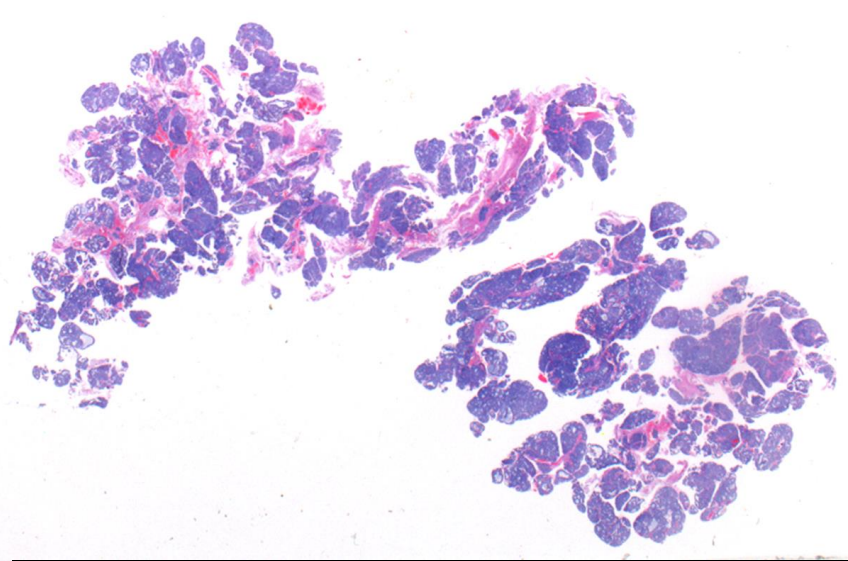
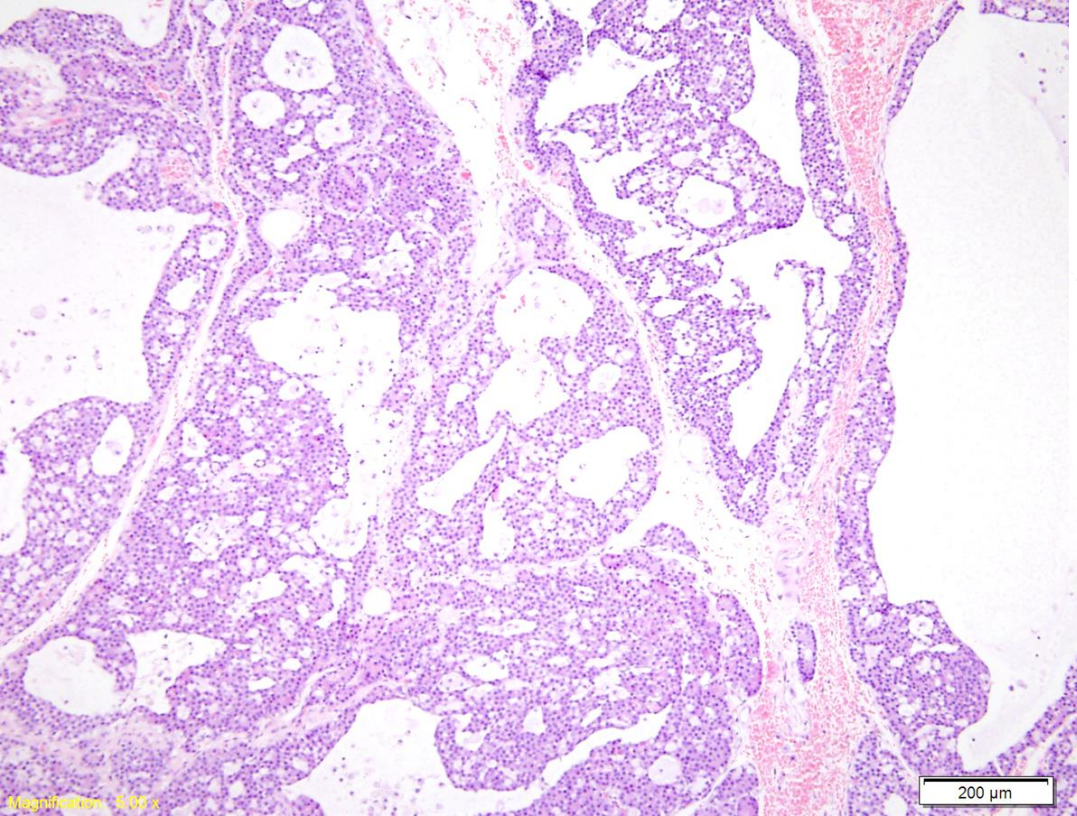
Headrick JF, Bentley E, Dubielzig RR. (2004) Canine lobular orbital adenoma: A report of 15 cases with distinctive features. *Vet. Ophthalmol.* 7: 47.

Canine Orbital Lobular Adenoma



Canine Orbital Lobular Adenoma





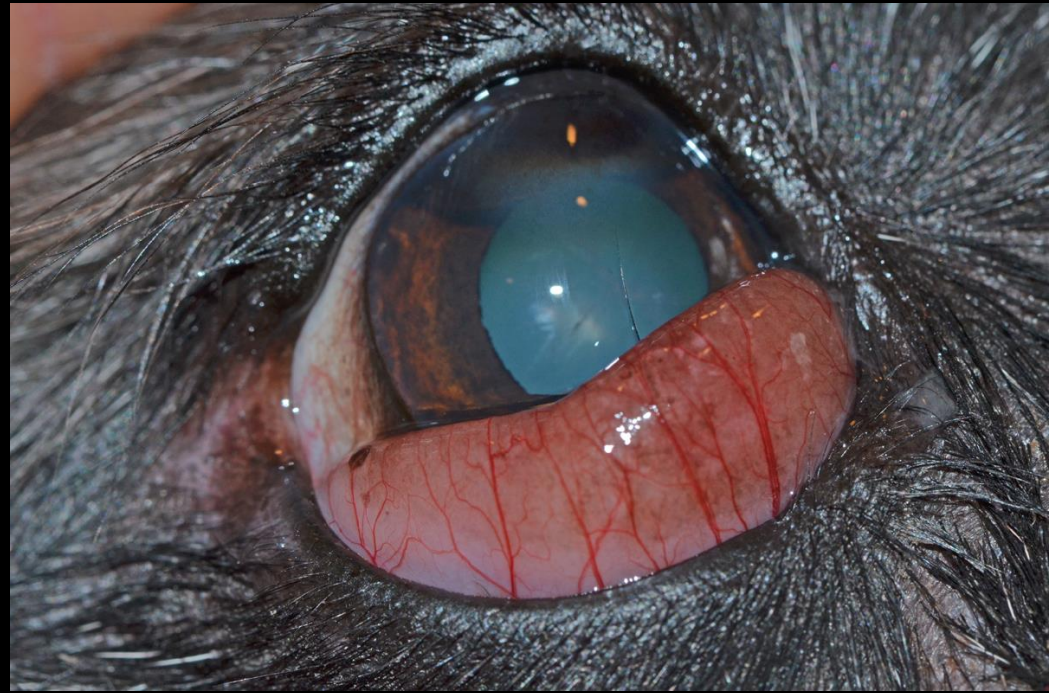
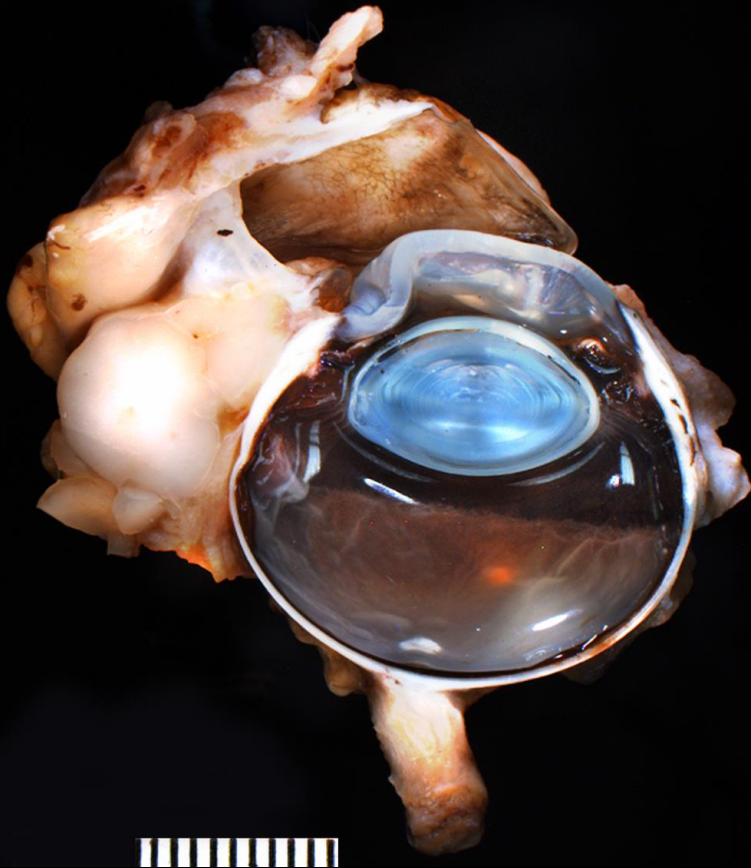
Canine Orbital Lobular
Adenoma

10/13 cases with follow-up had at least one recurrence

- Case 1.....240 days
- Case 3.....635d & 1300d (bilateral)
- Case 5.....90d
- Case 6.....365d & 515d & 995d (bilateral)
- Case 7.....600d
- Case 8.....Multiple (unknown periods)
- Case 10.....660d
- Case 13.....370d
- Case 14.....315d
- Case 15.....210d & 565d
- Cases 2, 4, & 9 euthanized prior to recurrence
- Cases 11 & 12 lost to follow-up

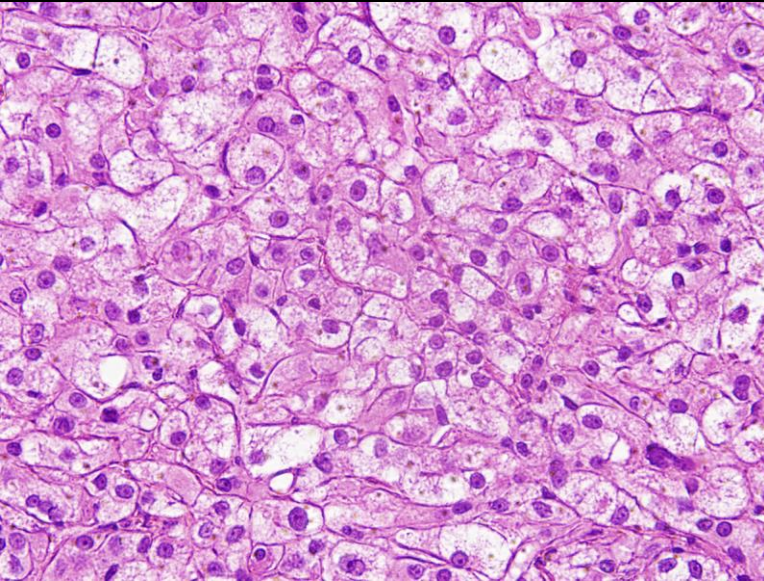
Canine Orbital Hibernoma: 13cases

Tumor of Brown Fat

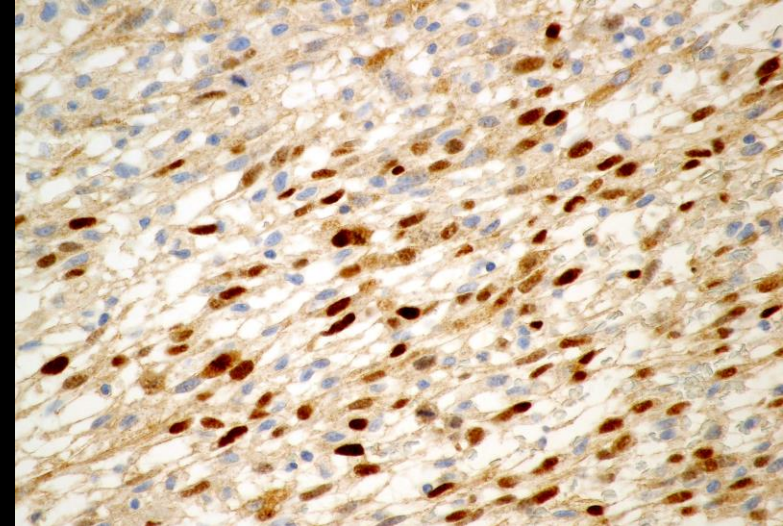
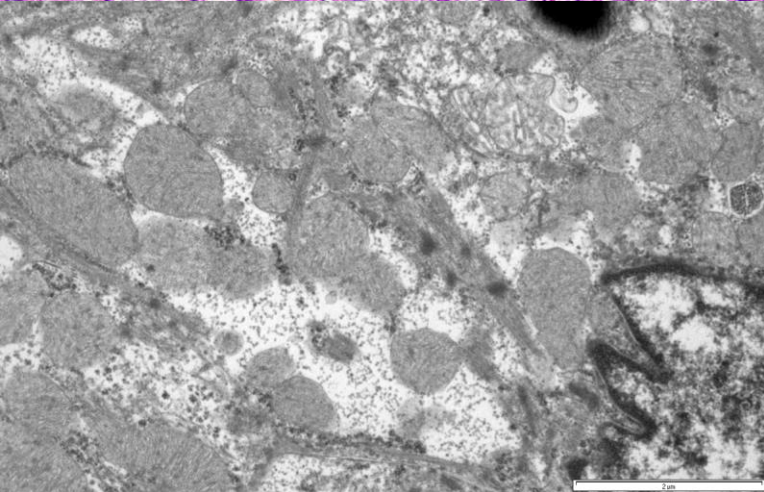
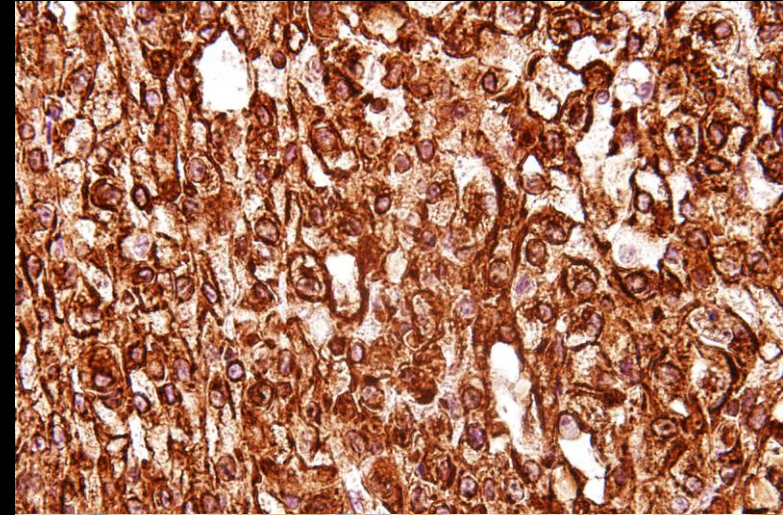


Canine Orbital Hibernoma

H&E



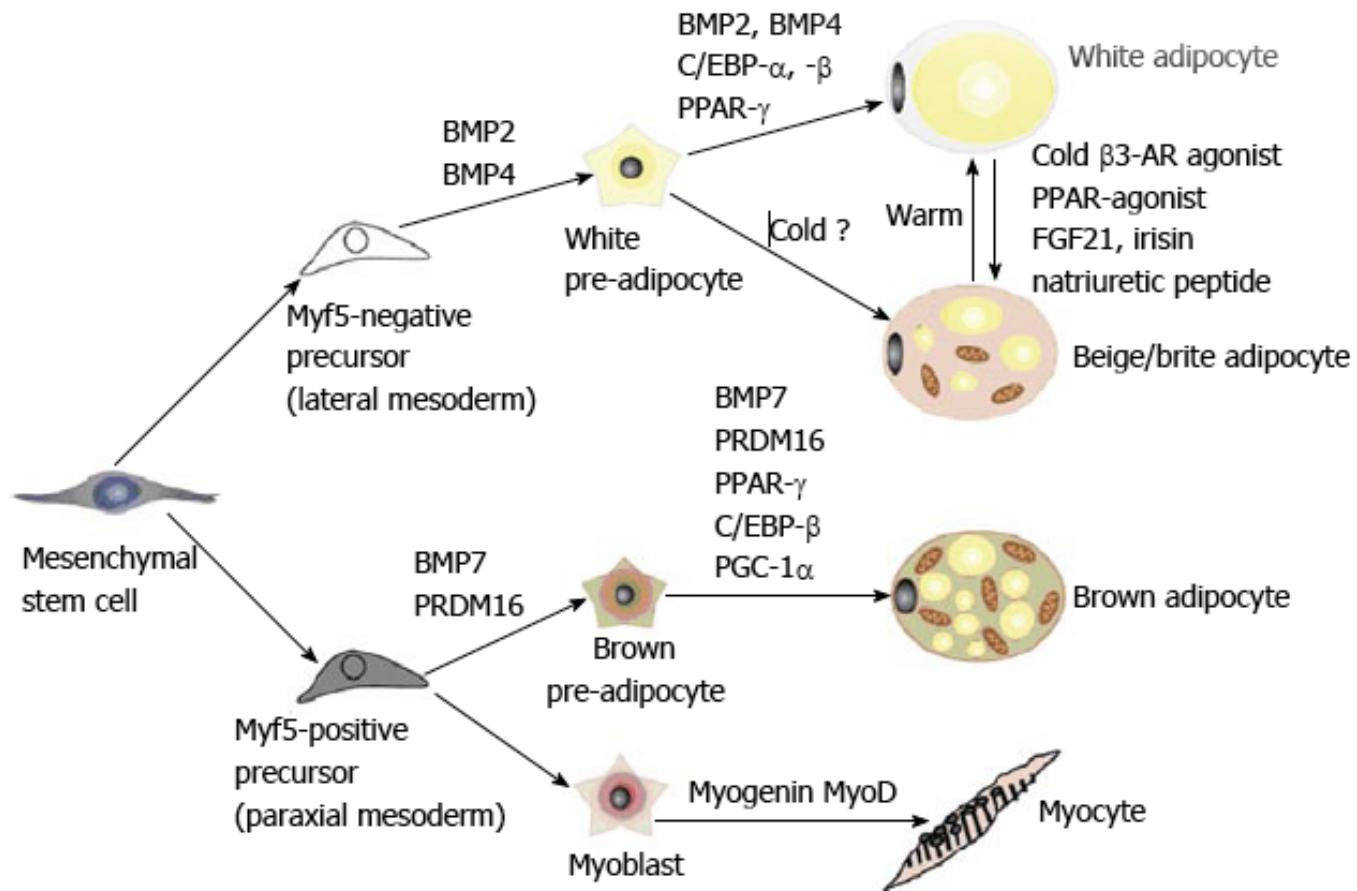
Vimentin



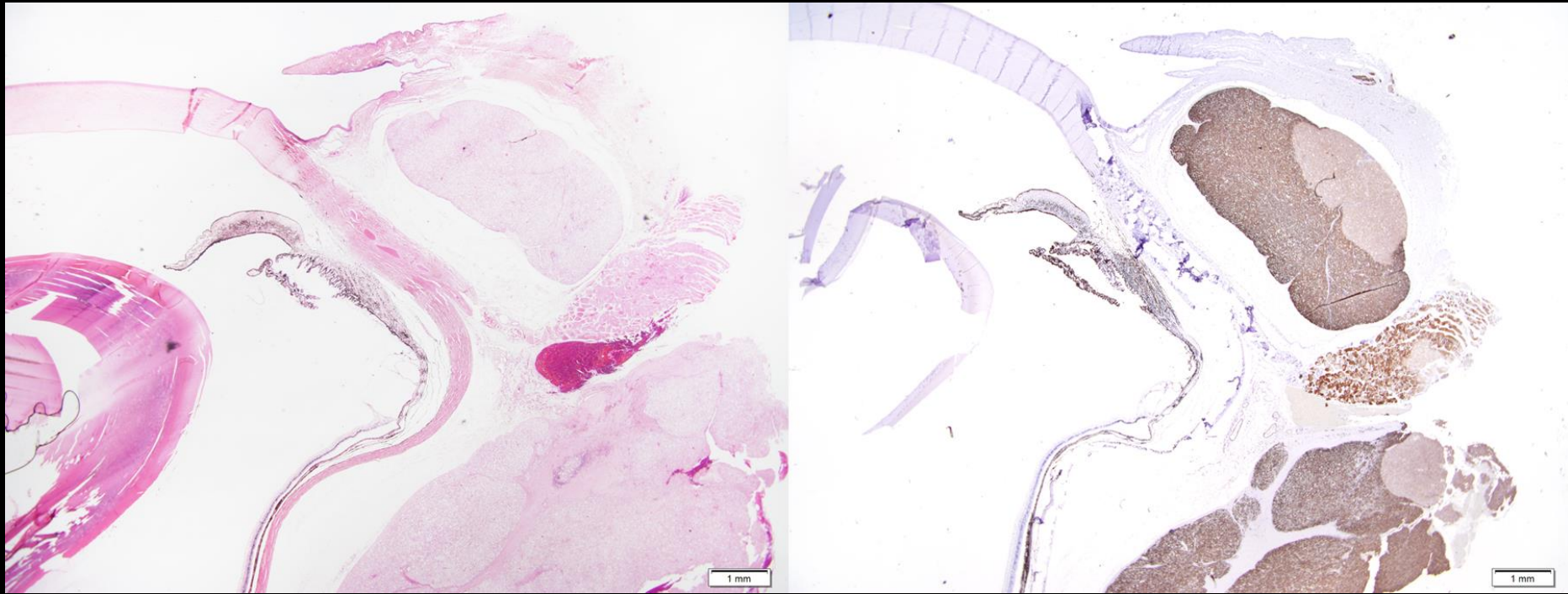
TEM

Myo D Nuclear stain

Brown Fat Shares a Progenitor Cell With Skeletal Muscle



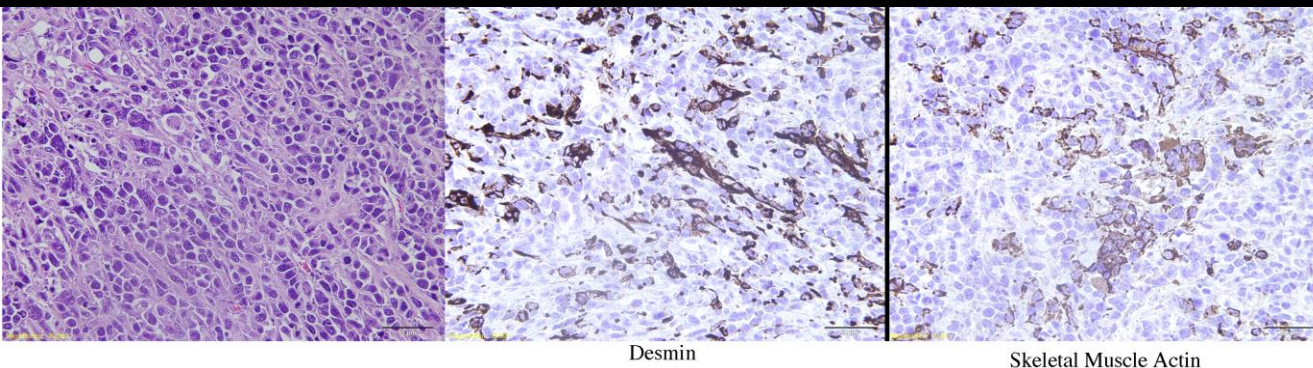
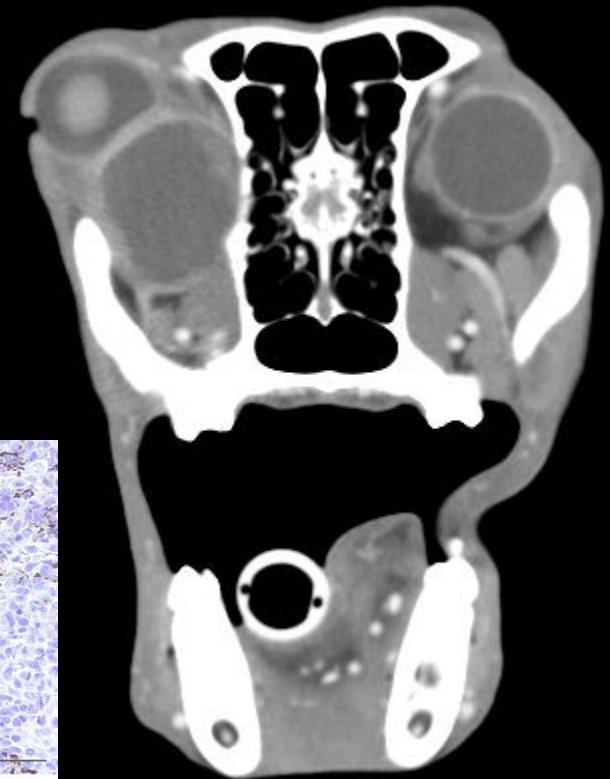
Brown Fat Shares a Progenitor Cell With Skeletal Muscle



**Currently we are using Desmin as
A marker for hibernoma**

Orbital Rhabdomyosarcoma

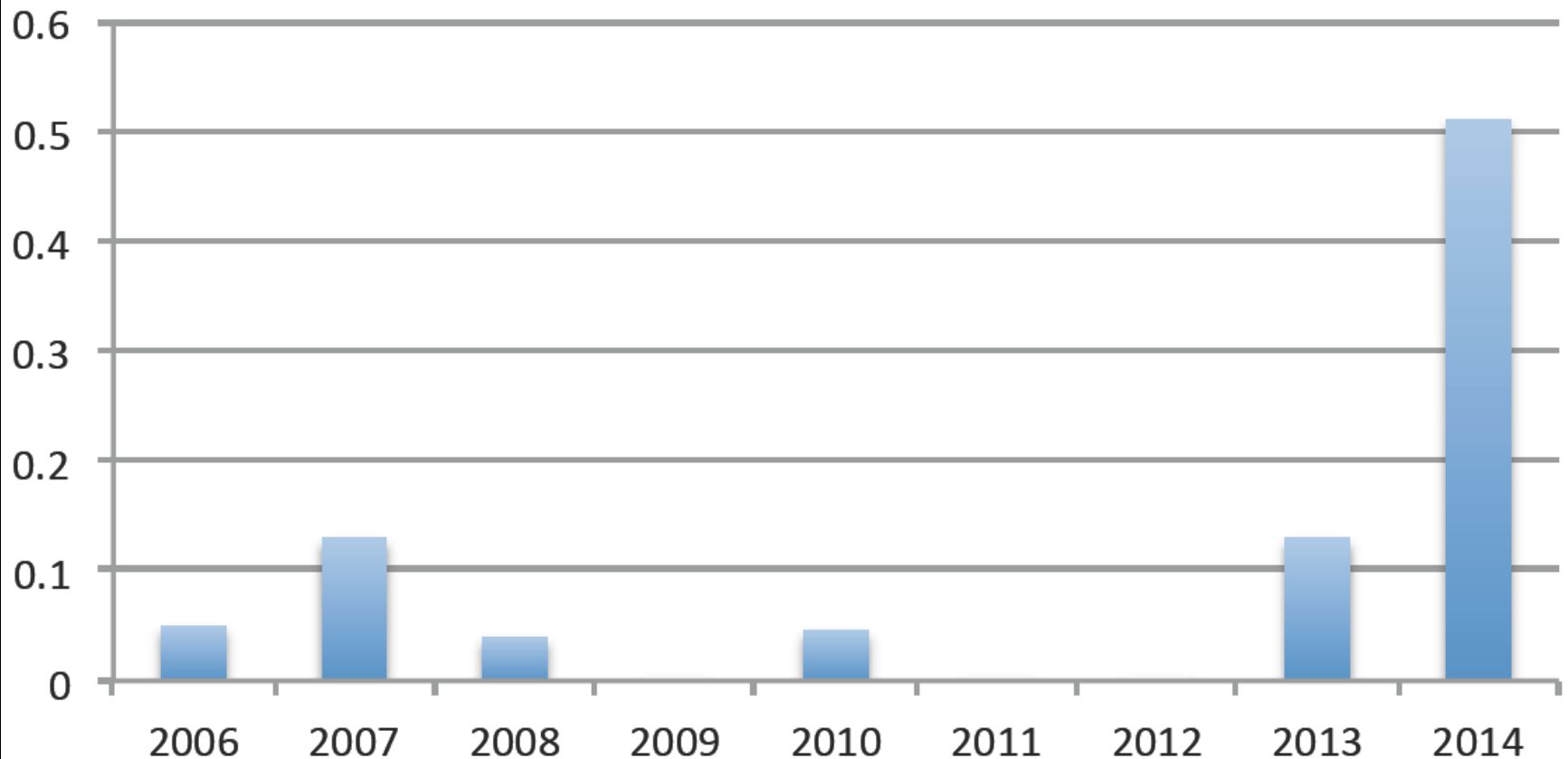
- 19 cases
- 2 Belgian terrier and 5 German shepherds
- 12 less than 4 years-old
- Genders equal
- 11 OD & 4 OS
- The prognosis is very bad for the young dogs



Orbital Rhabdomyosarcoma

% of cases by Year

COR: Percent of COPLOW Submissions



Orbital Rhabdomyosarcoma

