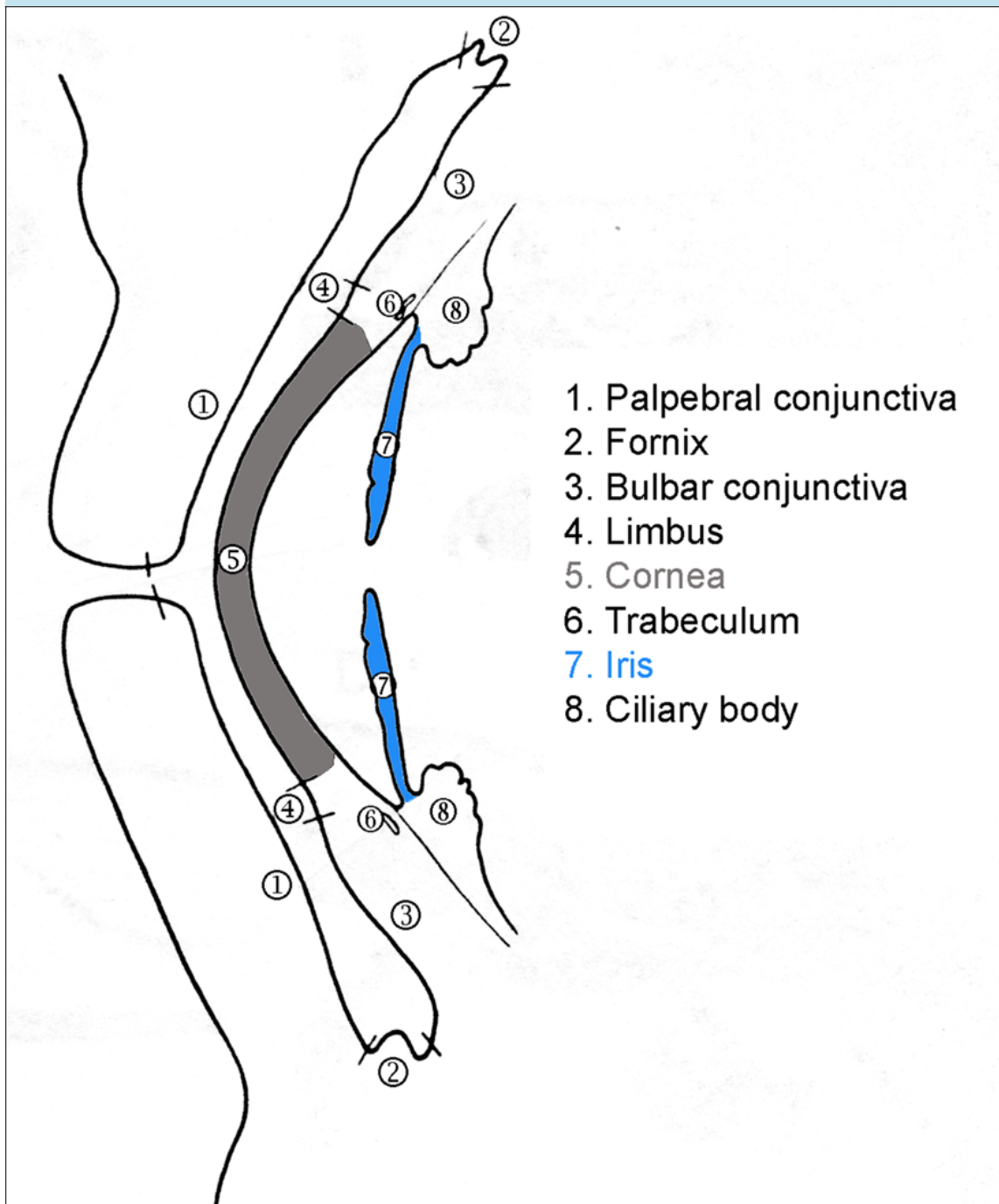


# A Histological Study of the Conjunctiva and associated tissues in Red-Tailed Hawks and Great Horned Owls



Brian  
Jochems

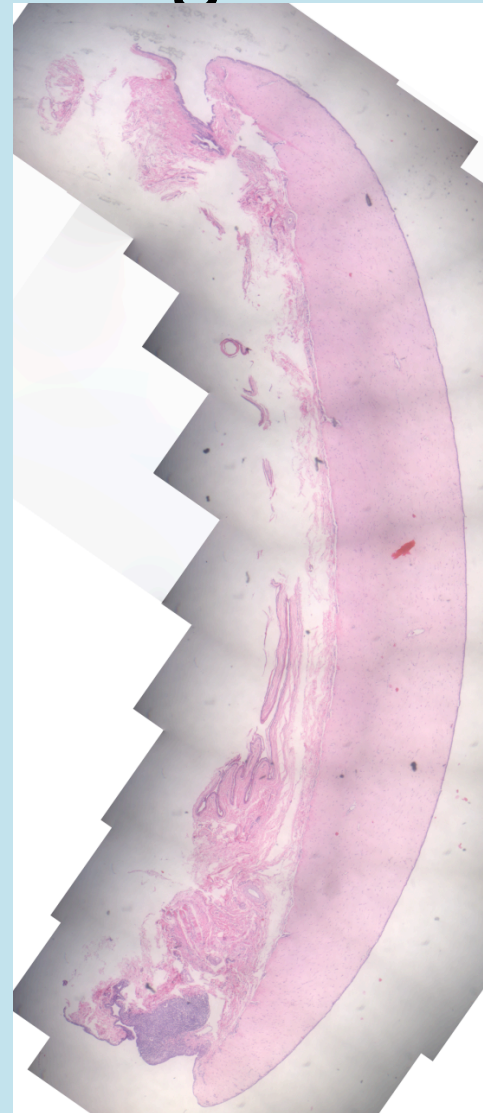




Where is the  
Conjunctiva?

# Tissue Staining: Haematoxylin and eosin (H&E) staining

- Haematoxylin and eosin staining protocol is used frequently in histology to examine thin sections of tissue
- Haematoxylin stains cell nuclei blue, while eosin stains cytoplasm, connective tissue and other extracellular substances pink or red
- Eosin is strongly absorbed by red blood cells, coloring them bright red
- In a skillfully made H & E preparation the red blood cells are almost orange, and collagen and cytoplasm (especially muscle) acquire different shades of pink.



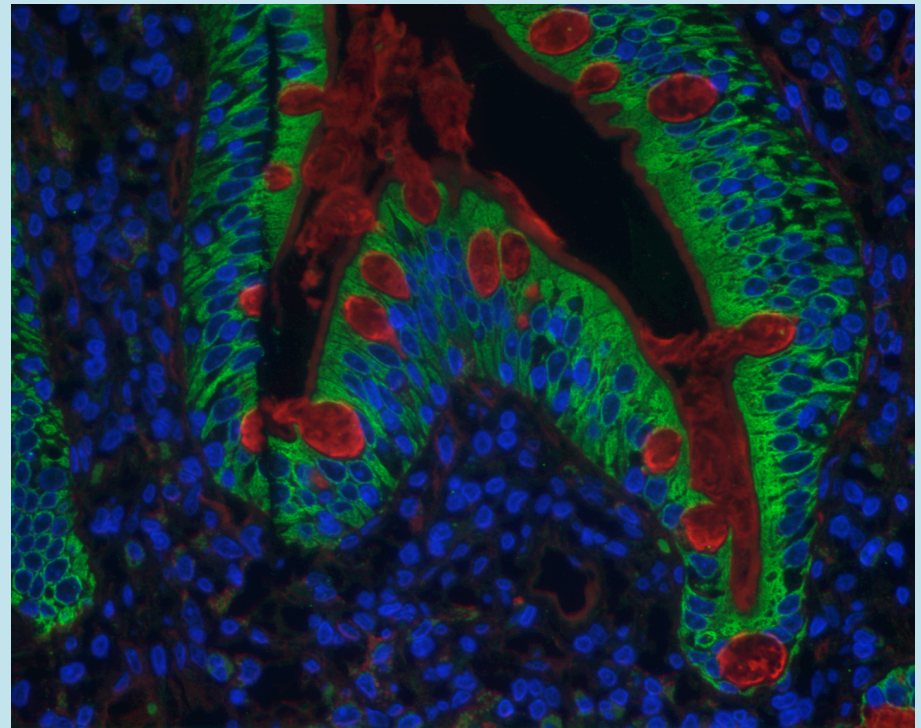
# Nictitating Membrane



- The nictitating membrane (from Latin nictare, to blink) is a transparent or translucent third eyelid present in some animals that can be drawn across the eye for protection and to moisten the eye while also maintaining visibility

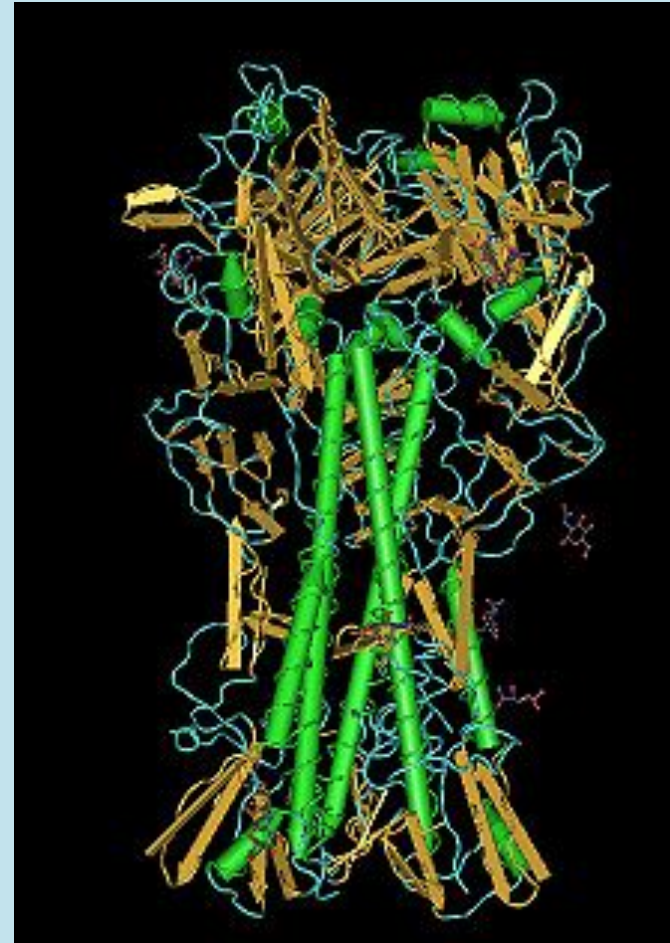
# Tissue Staining: Fluorescence

- Fluorescence is the emission of light by a substance that has absorbed light or other electromagnetic radiation of a different wavelength
- Fluorescence in the life sciences is used generally as a non-destructive way of tracking or analysis of biological molecules by means of the fluorescent emission at a specific frequency where there is no background from the excitation light, as relatively few cellular components are naturally fluorescent
- In fact, a protein or other component can be "labeled" with an extrinsic fluorophore, a fluorescent dye which can be a small molecule, protein or quantum dot, finding a large use in many biological applications.



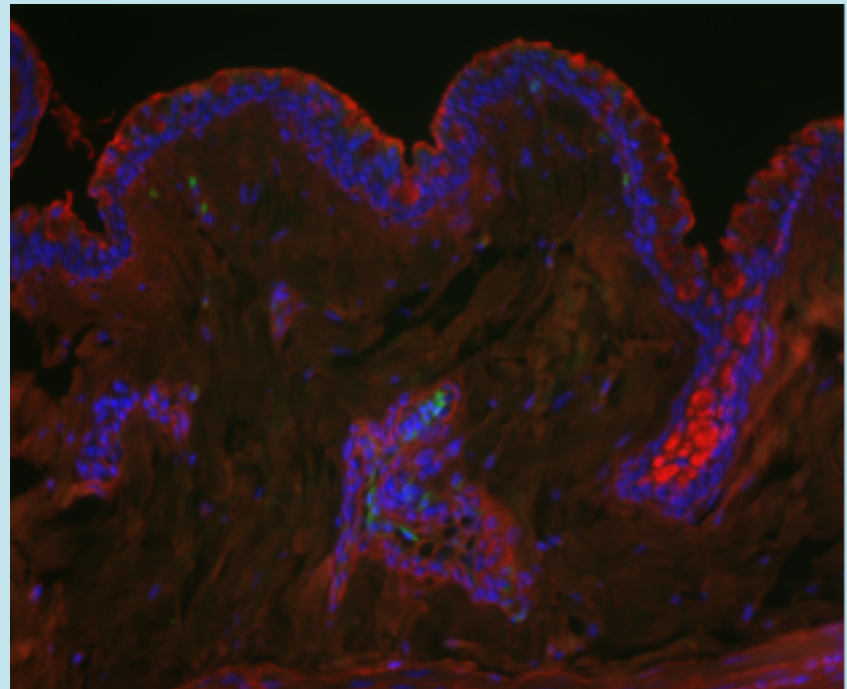
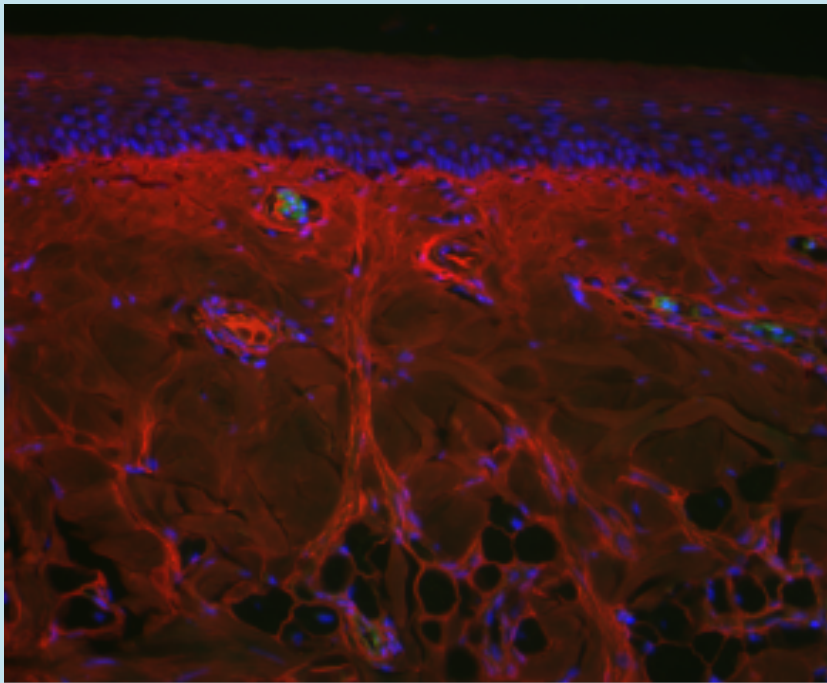
# Lectin Staining: What are Lectins?

- Lectins are sugar-binding proteins (not to be confused with glycoproteins, which are proteins containing sugar chains or residues) that are highly specific for their sugar moieties
- They play a role in biological recognition phenomena involving cells and proteins



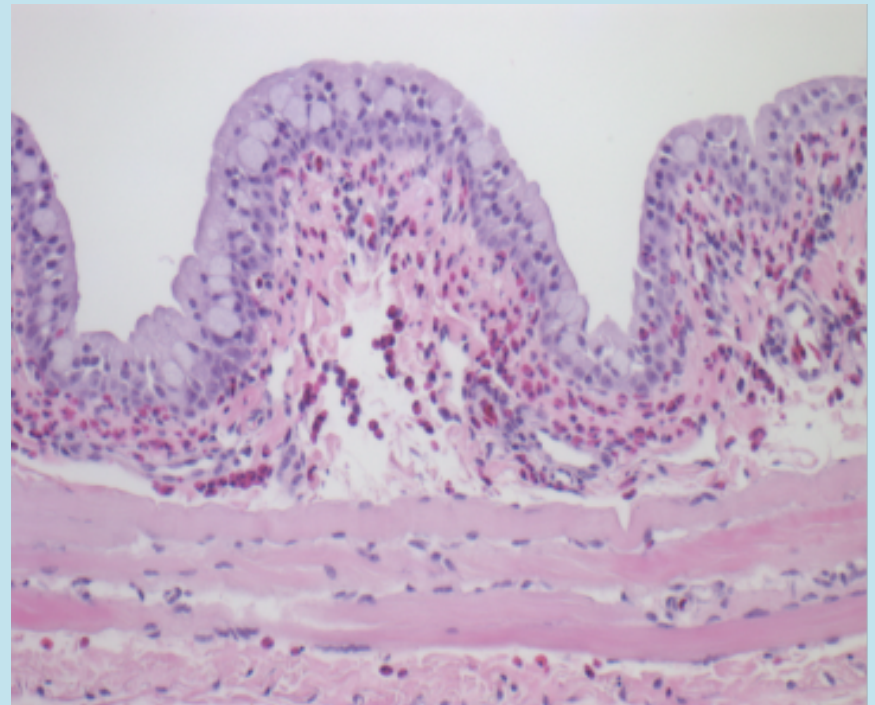
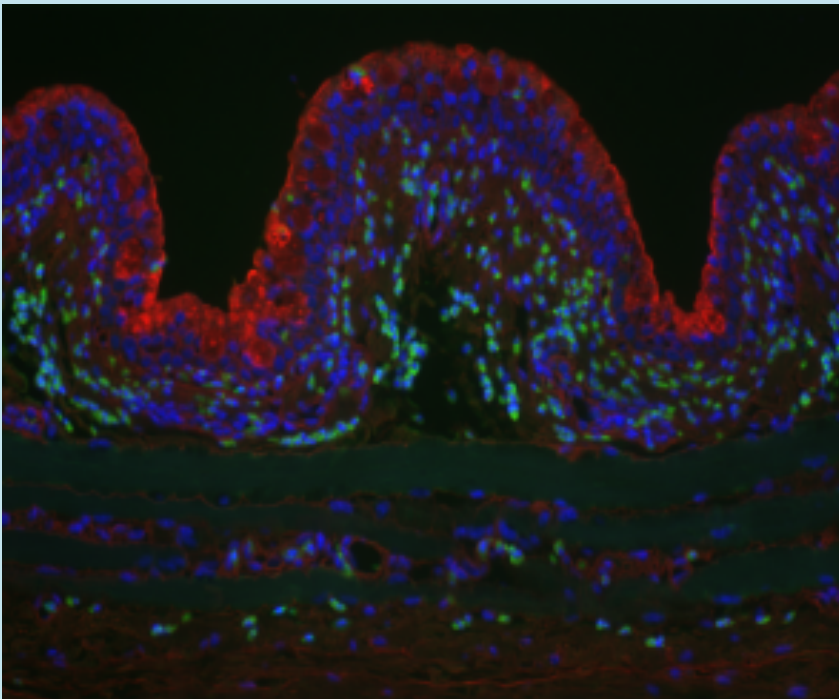
# Lectin Staining: DAPI, WGA, AAL (fucose)

- Aleuria Aurantia staining is almost nonexistent in tissues, some staining apparent in blood vessels

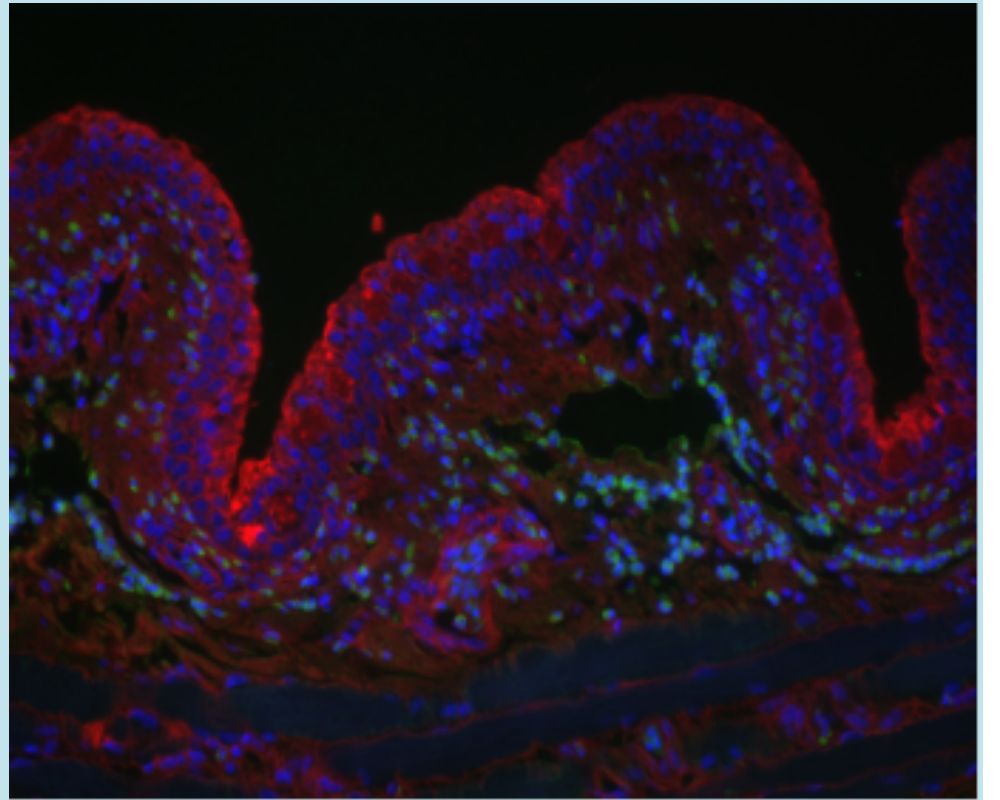
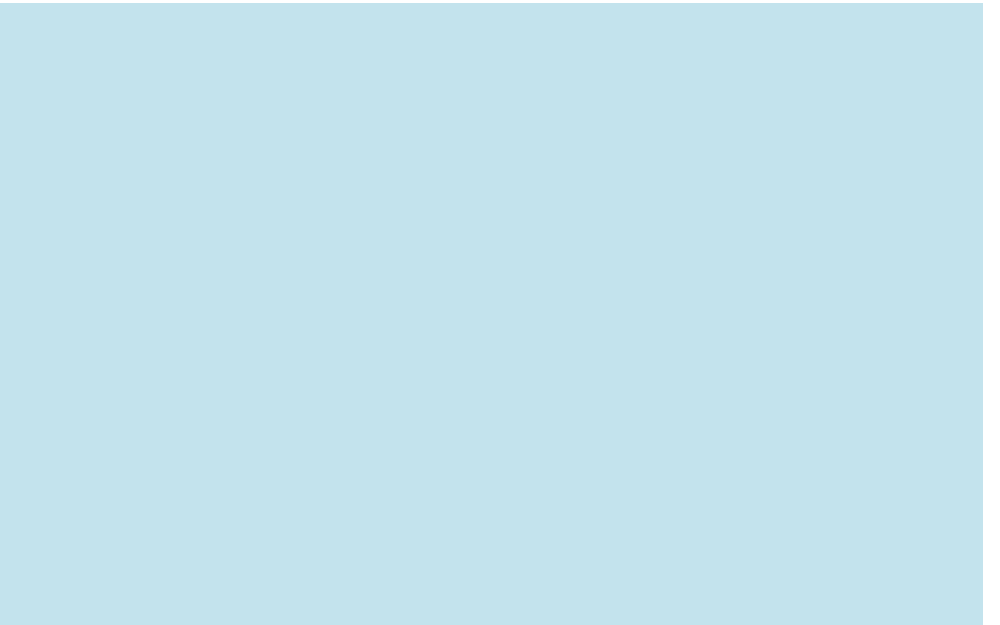
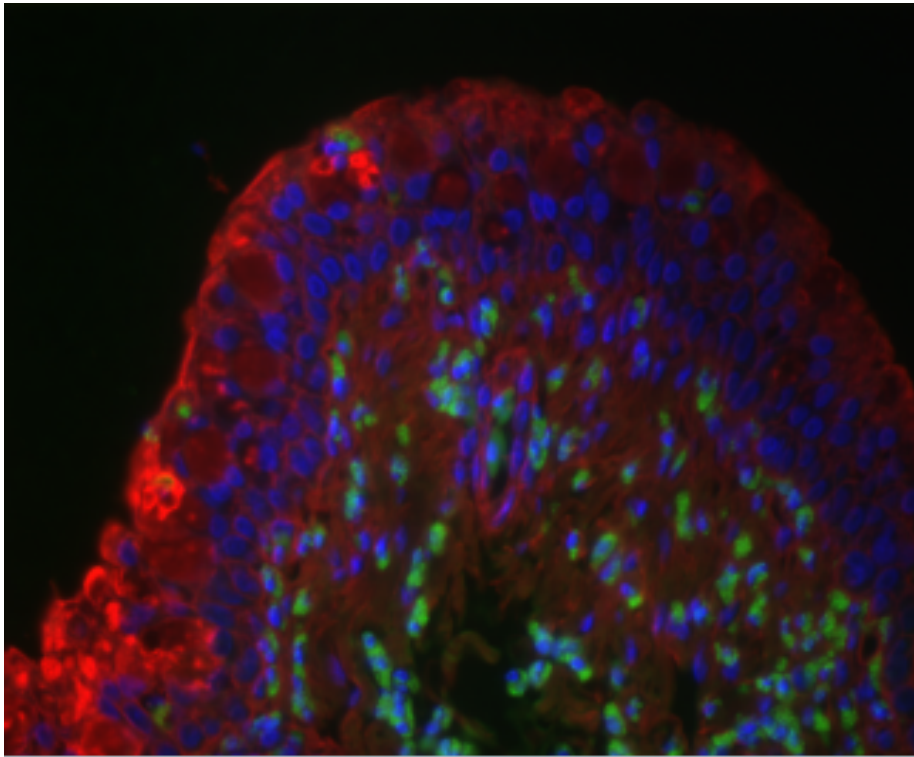


# Lectin Staining: DAPI, WGA, UEA-1 (fucose)

- UEA seemed to stain what looks to be eosinophil cells due to the location and perhaps bi-lobed nucleus

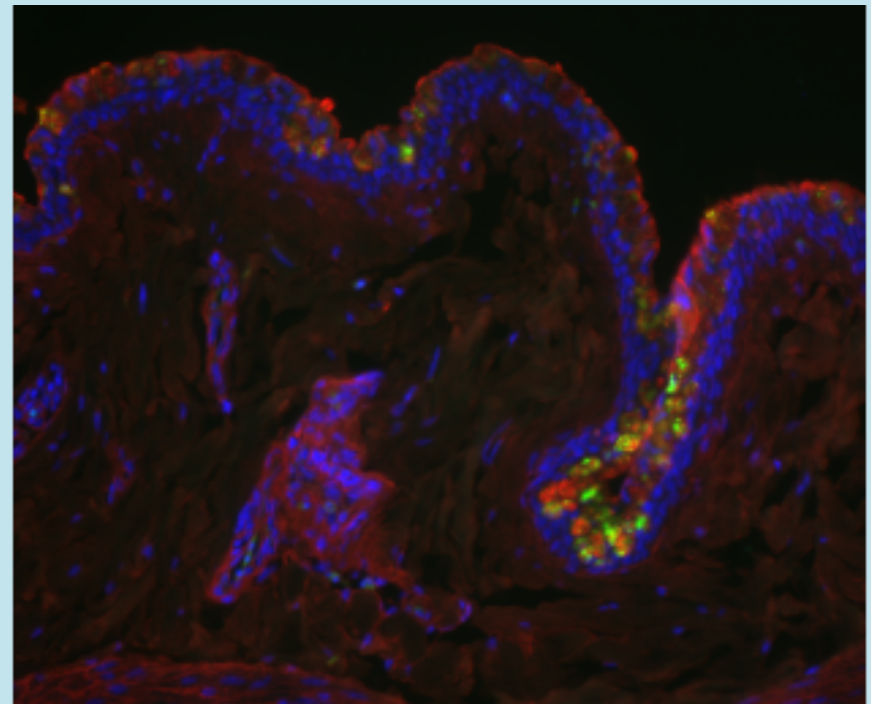
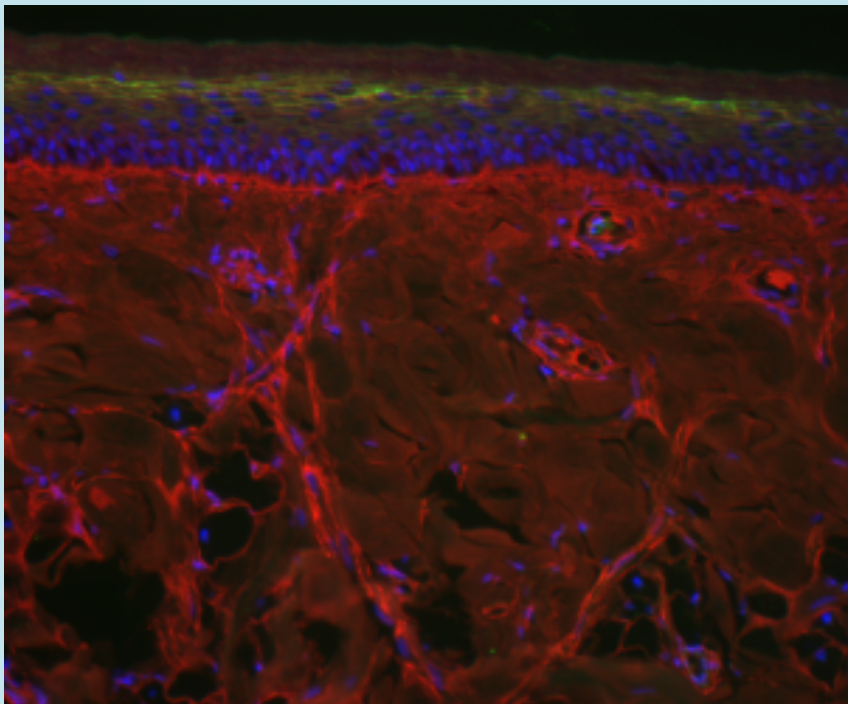




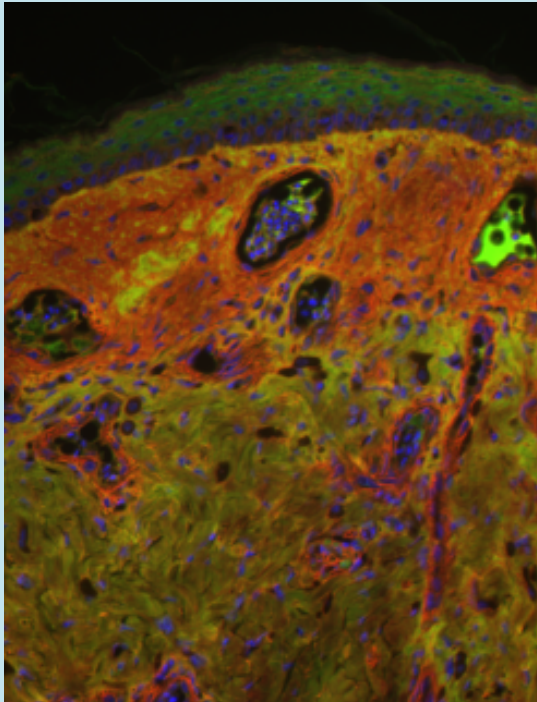


# Lectin Staining: DAPI, WGA, PNA

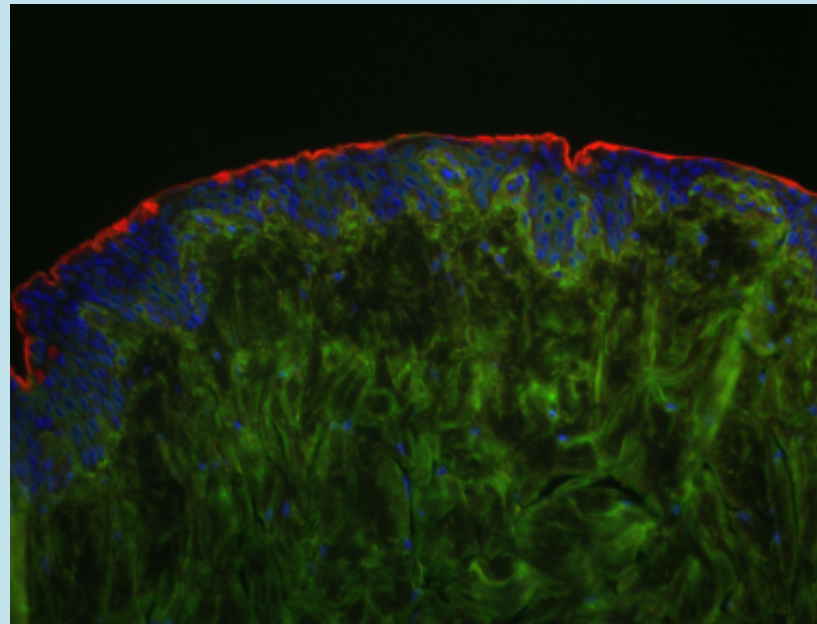
- PNA showed some interesting highly selective staining of goblet cells within the conjunctiva. It also showed a bit of staining in the upper layer of epithelial cells in the keratinized region.

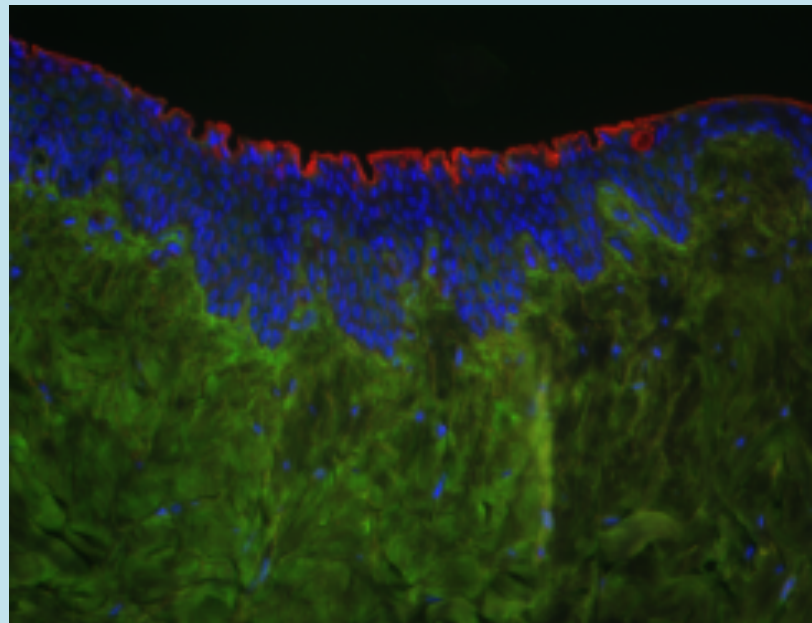
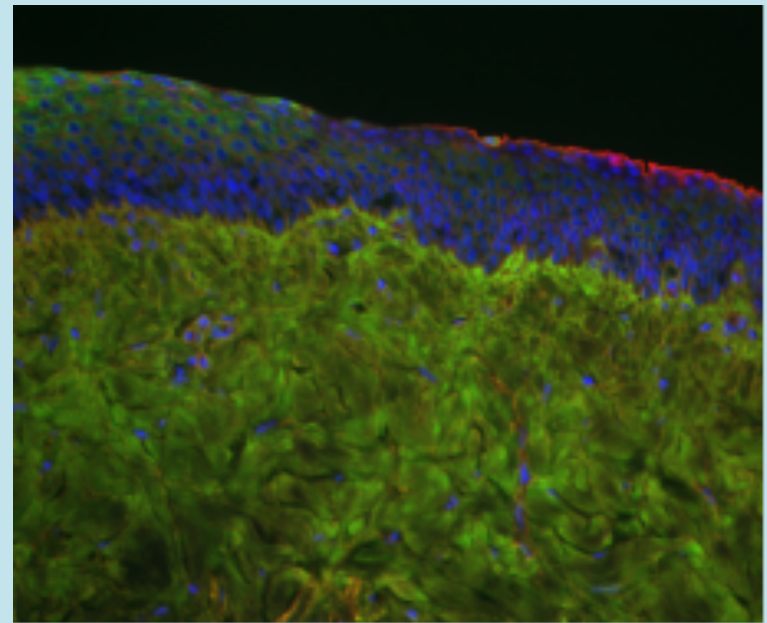
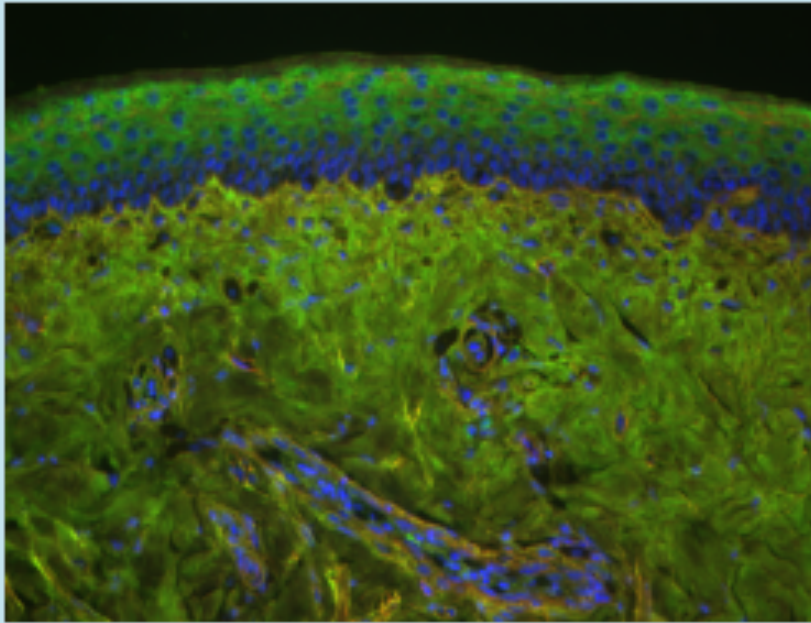


# Lectin Staining: DAPI, WGA, ConA (mannose and glucose)

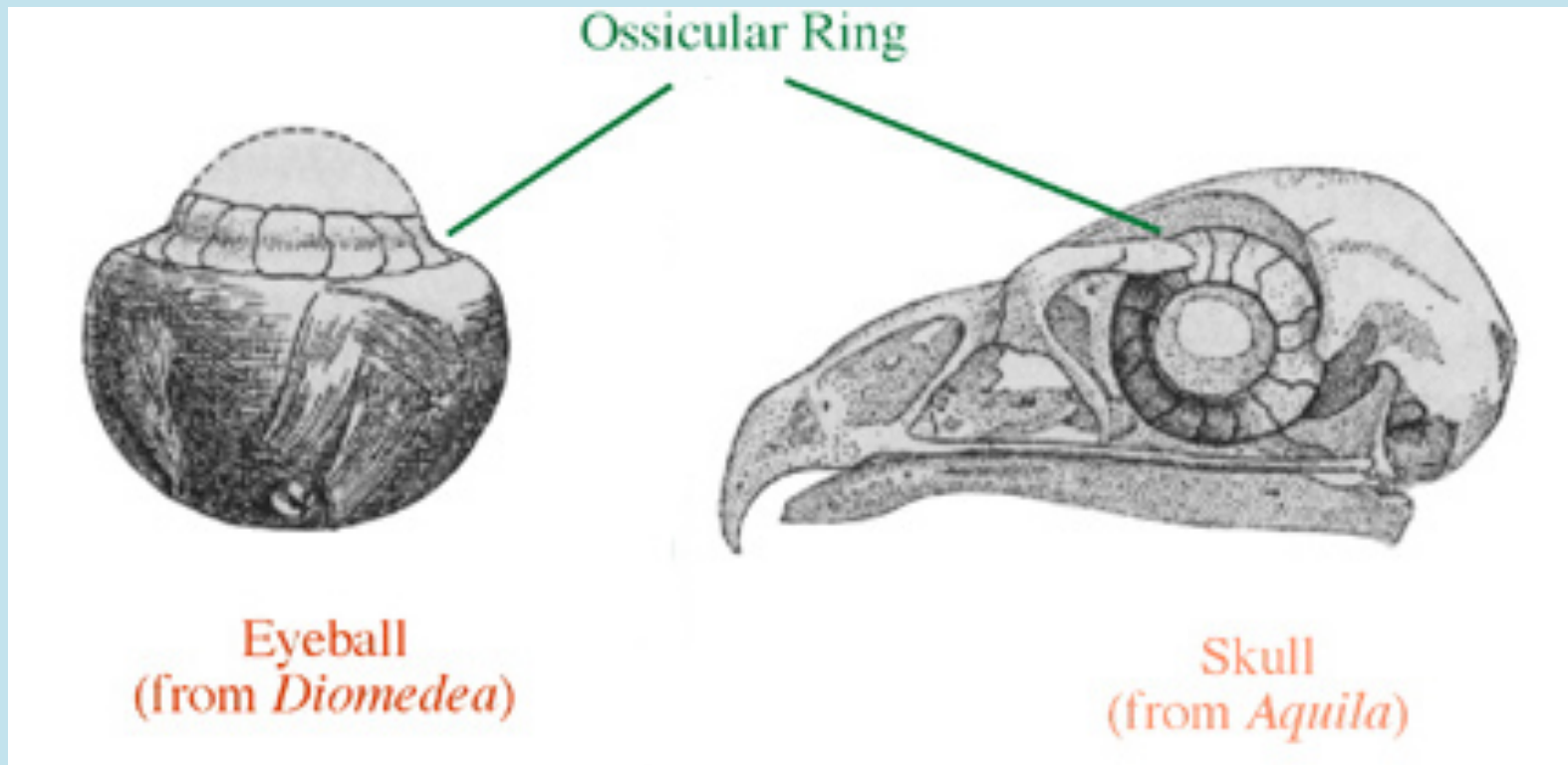


- ConA stained well the tissues under the epithelia layer, including nice collagen staining. In some areas both the WGA and ConA seemed to be well stained throughout the tissue. In slides on next page, it is noticeable that something in the keratinized epithelium stains with ConA, and is gone in the unkeratinized region, replaced with something on the edge of the epithelium that is stained by WGA.





# Scleral Ossicles: Where are they?



# Scleral Ossicles

Red-  
Tailed  
Hawk

Vs.

Great  
Horned  
Owl

