COMPARATIVE VERTEBRATE ANATOMY

4 Labs

Goals:

1) **Gain an appreciation of the anatomical diversity among the vertebrates**

2) **Relate form and function in diverse animals**

3) **Work towards success on the lab practical (150 points)**

5 Vertebrate Classes

Chondrichthys -- Dogfish shark
Amphibia --------- Bullfrog
Reptilia ---------- Snake
Aves ---------- Pigeon
Mammalia -------- Pig (fetal)

Emphasis
Anatomy
Function

15 students in 4 groups

3	**3**
4	**3**
4	**4**
4	**4**

General Observations

Work will be largely independent

Labs won't have well-defined endpoints

To do well …

- **put in the time (outside of class)**
- **think review**
- **collaborate within & across groups**

Safety

Report perceived dangers and any injuries

Sharp instruments

Preservatives … gloves

Toed shoes and long pants

Food/water/candy etc. must be invisible

Working With Specimens

- Specimens should be on trays

- Work slowly using mostly BLUNT DISSECTION

    * minimize use of scalpels
    * use forceps, probes, and fingers

- Use fiber optic lights

- Dissection scope

Working With Specimens

- No passive observers … everyone “digs in”

- Specimen Storage

    *alcohol-moistened toweling
    * bags with group name …
        … small specimens - tub
        … shark in bag
    * fridge

Working With Specimens

- Share findings with class

- End of lab

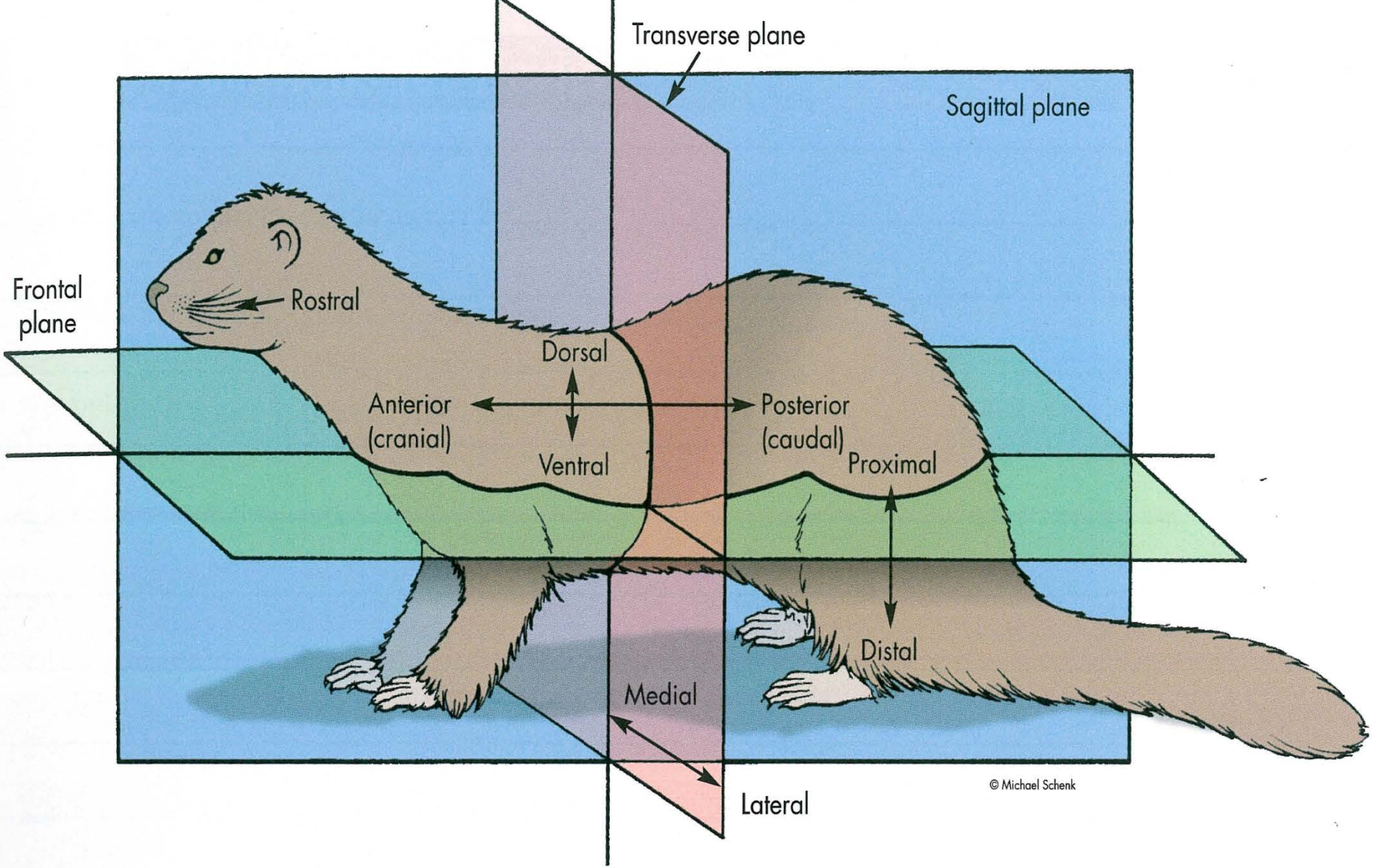
    * return specimens to fridge
    * clean and stack pans
    * clean, dry, and put away tools

- Outside of lab hours

Resources

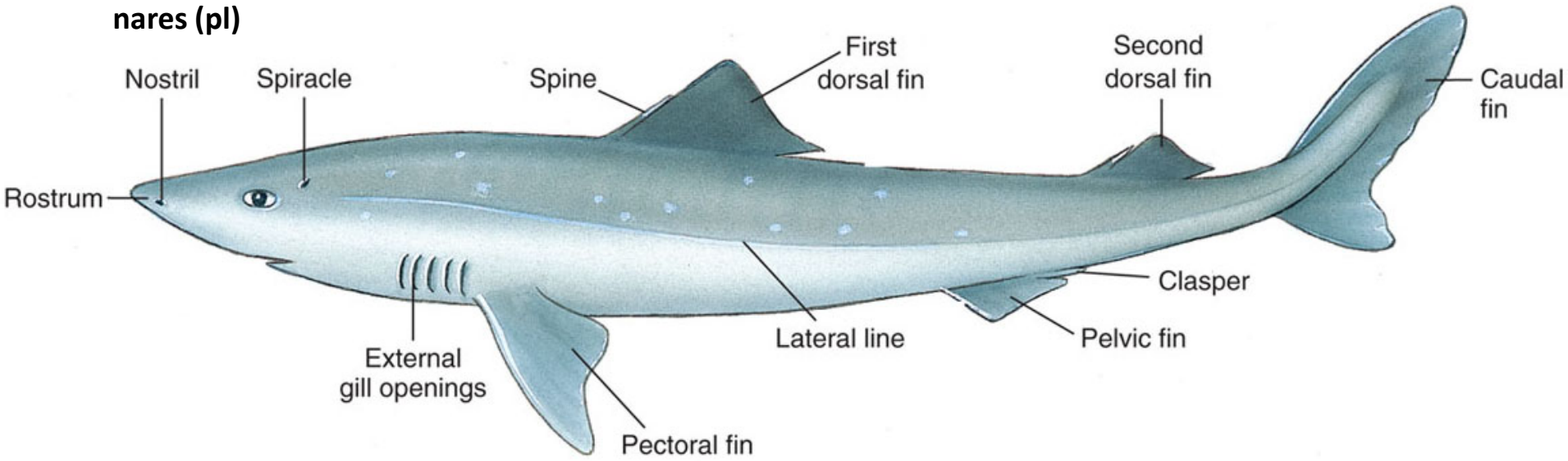
Always work with a visual guide

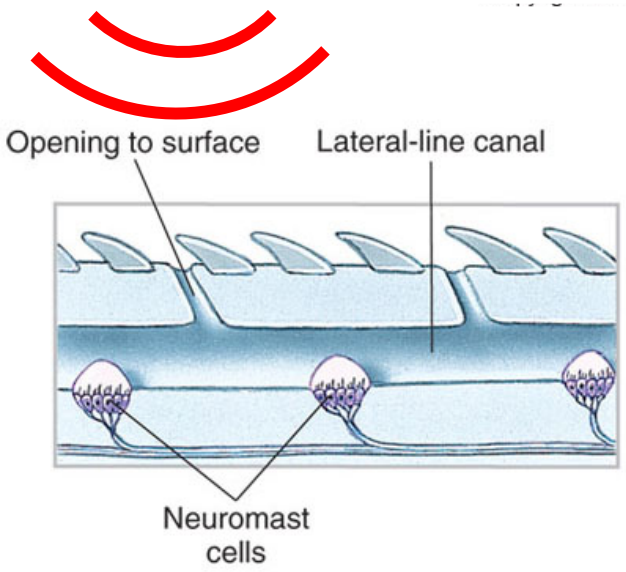
- **Hickman**
- **Lab manual (Smith and Schenk)**
- **Lab handout**
- **Other lab manuals**
- **Your laptop/internet**

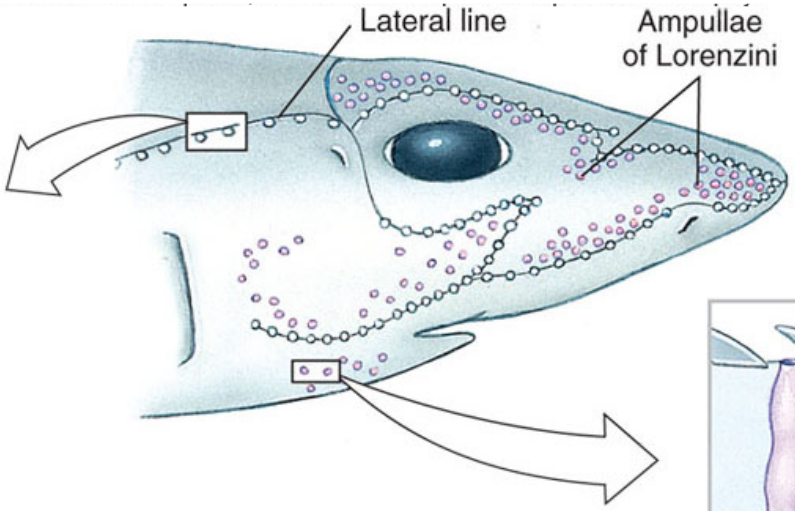


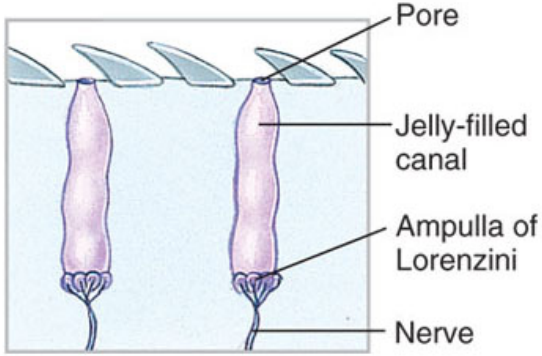
Deep & Superficial

naris (s)
nares (pl)



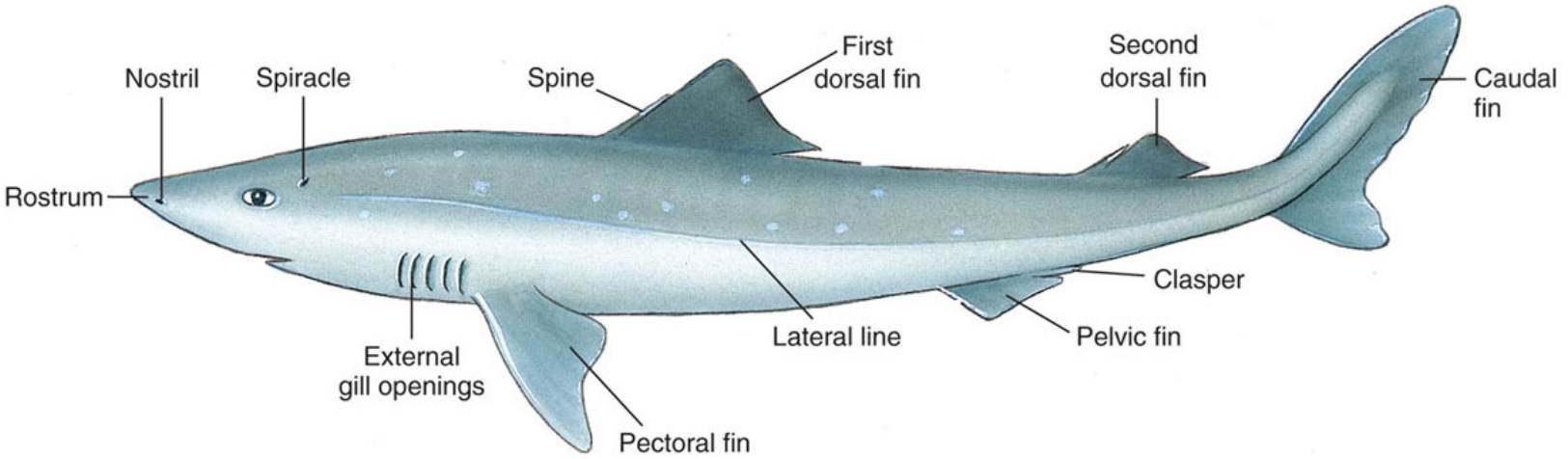




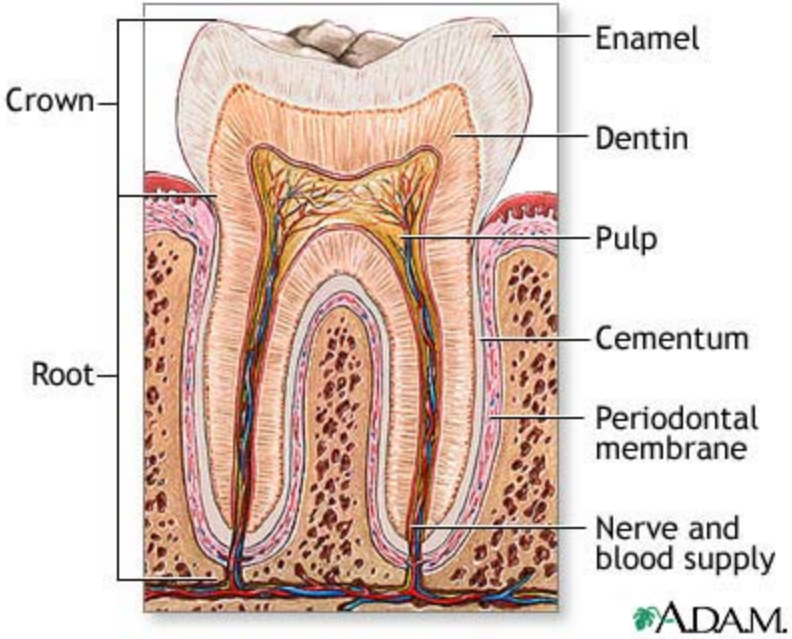


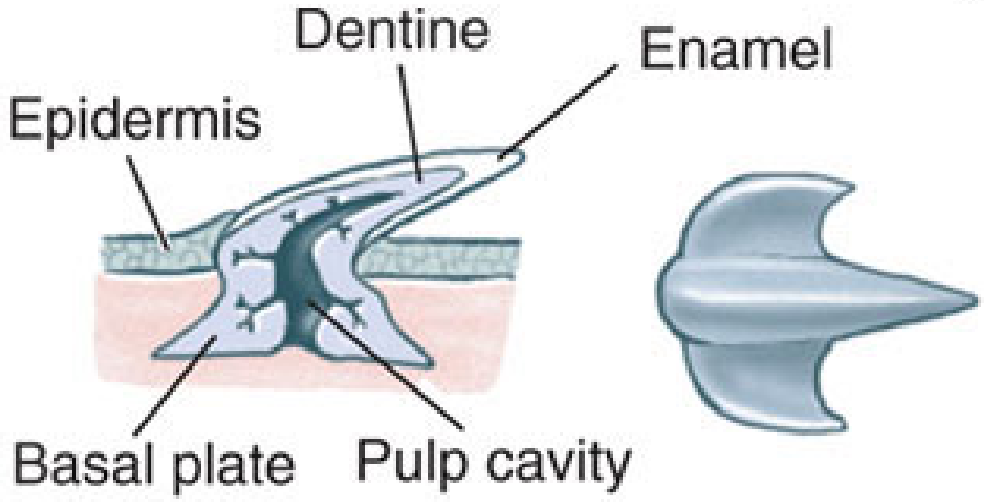
Water Movement Detection System

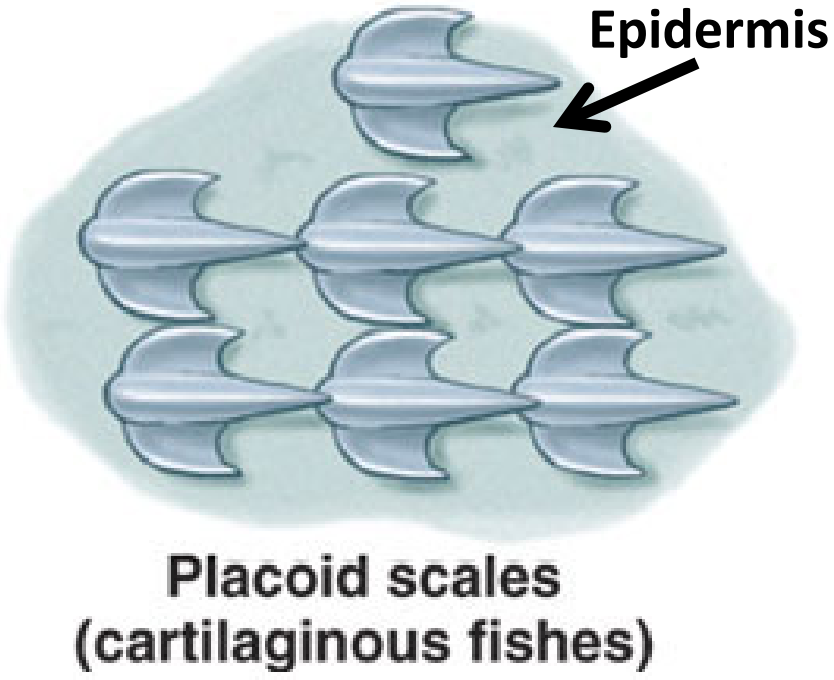
Electrical Field Detection System



Mammalian tooth







Placoid scales
(cartilaginous fishes)

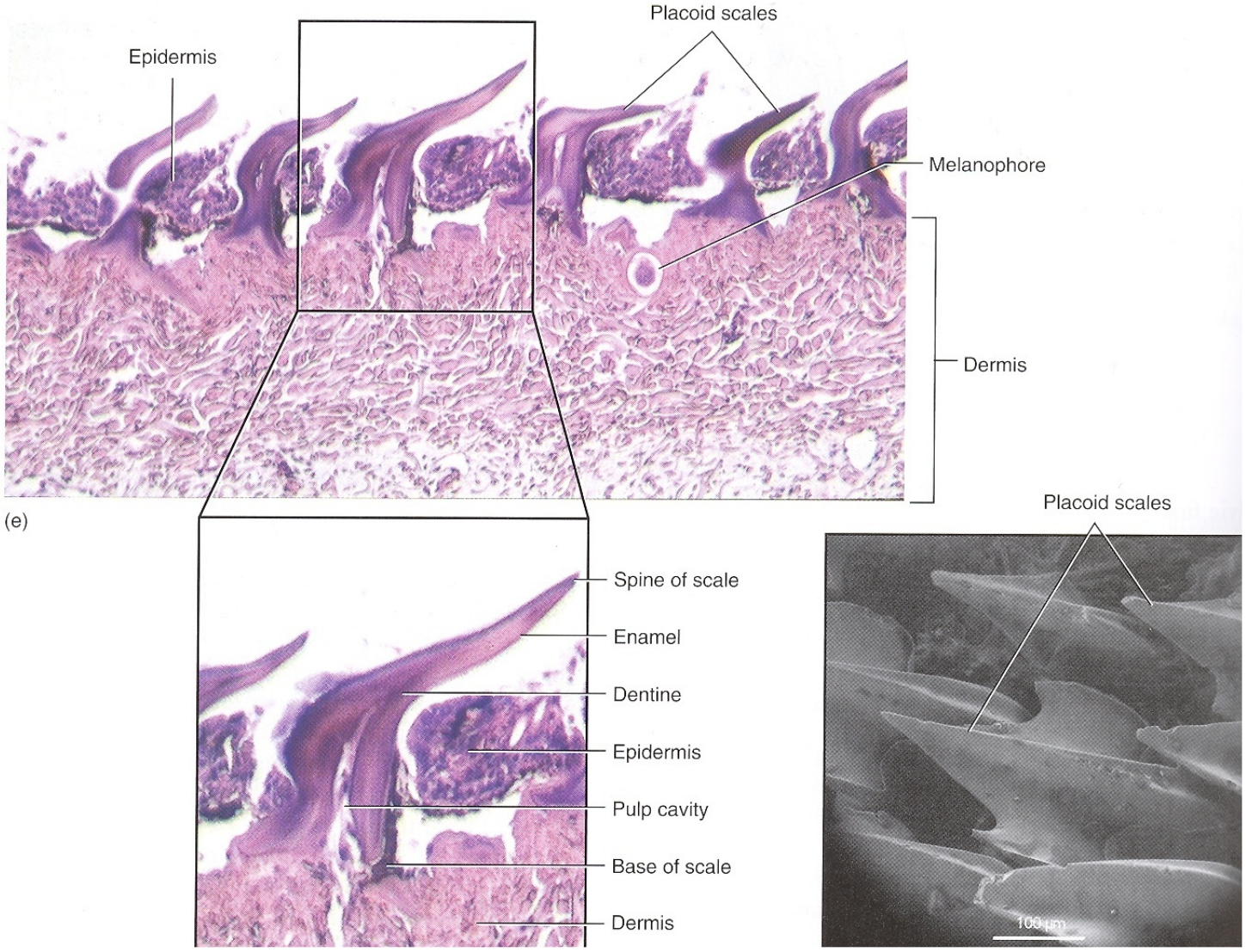
Placoid scales …

- are DERMAL

- are modified in the mouth as teeth

- are homologous to vertebrate teeth

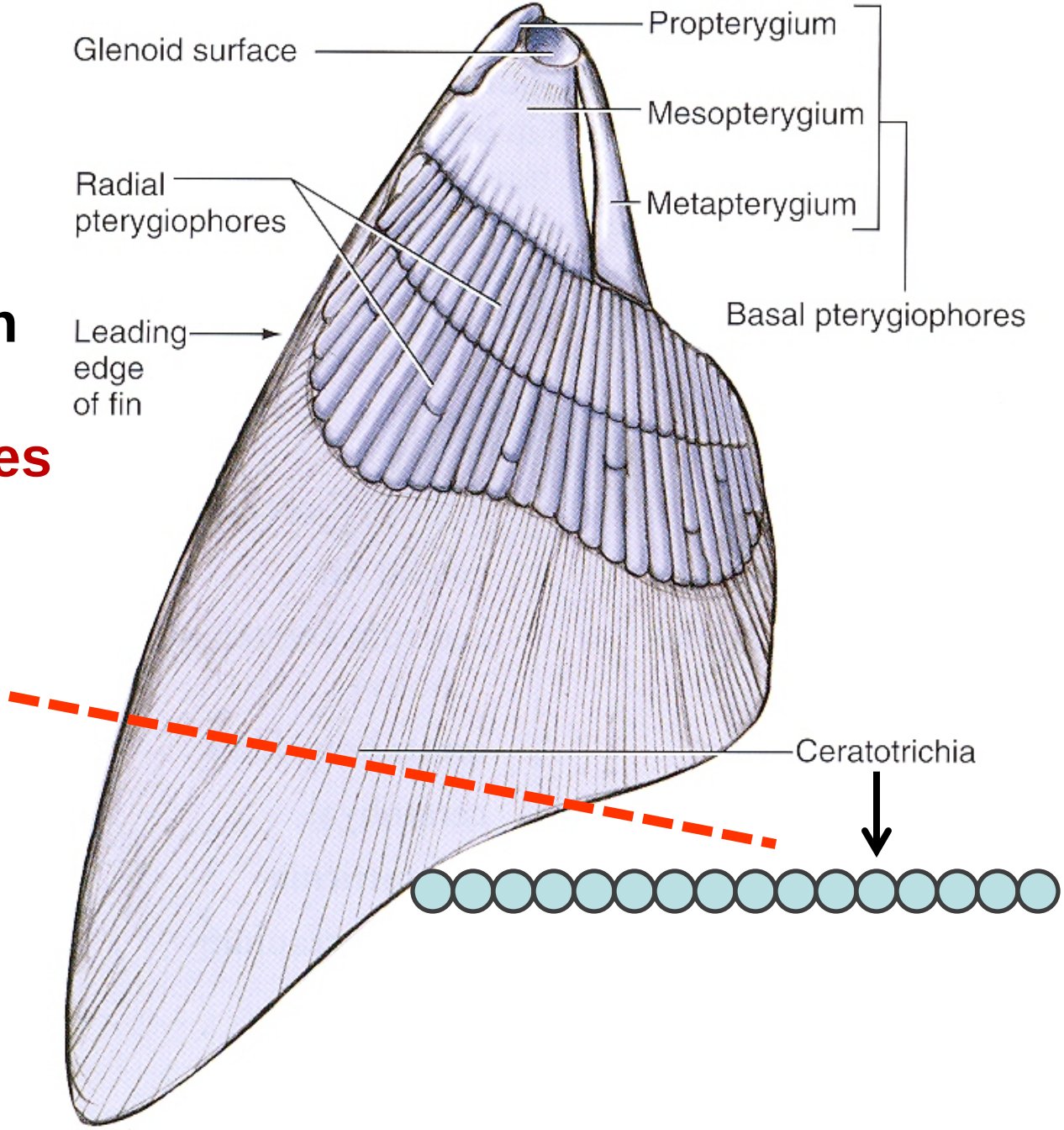
Placoid Scales

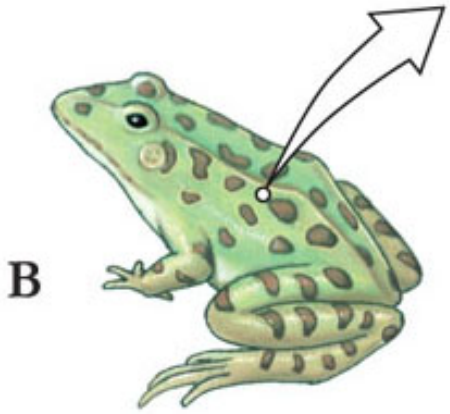


SHARK

Left pectoral fin

- **Pterygiophores**
- **Ceratotrichia**





B

Chromatophore (pigment cell)

Epidermis

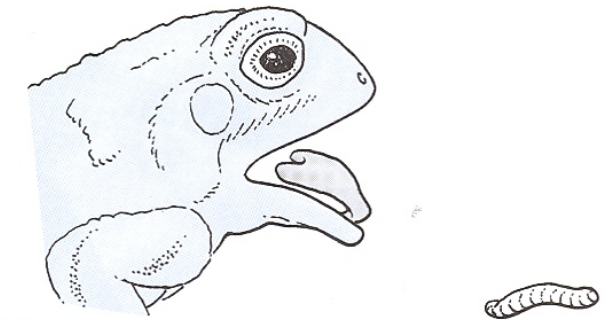
Spongy dermis

Compact dermis

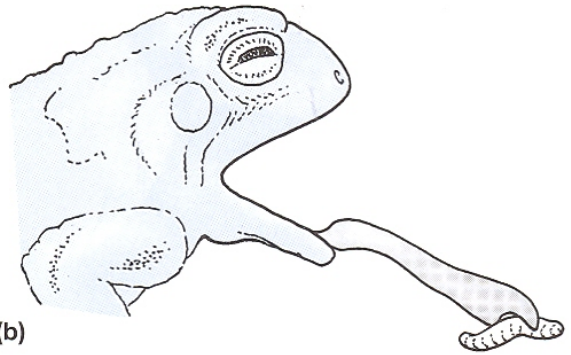
Poison gland

Blood vessels

Mucous gland



(a)



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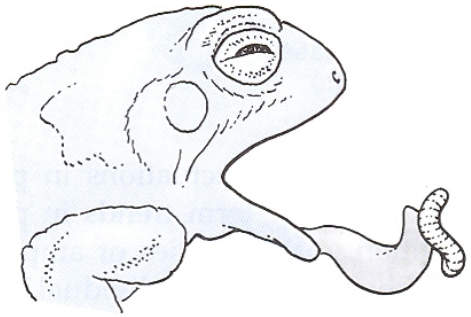

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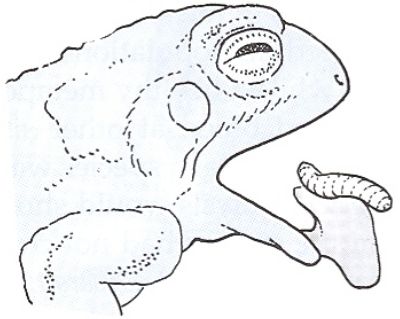
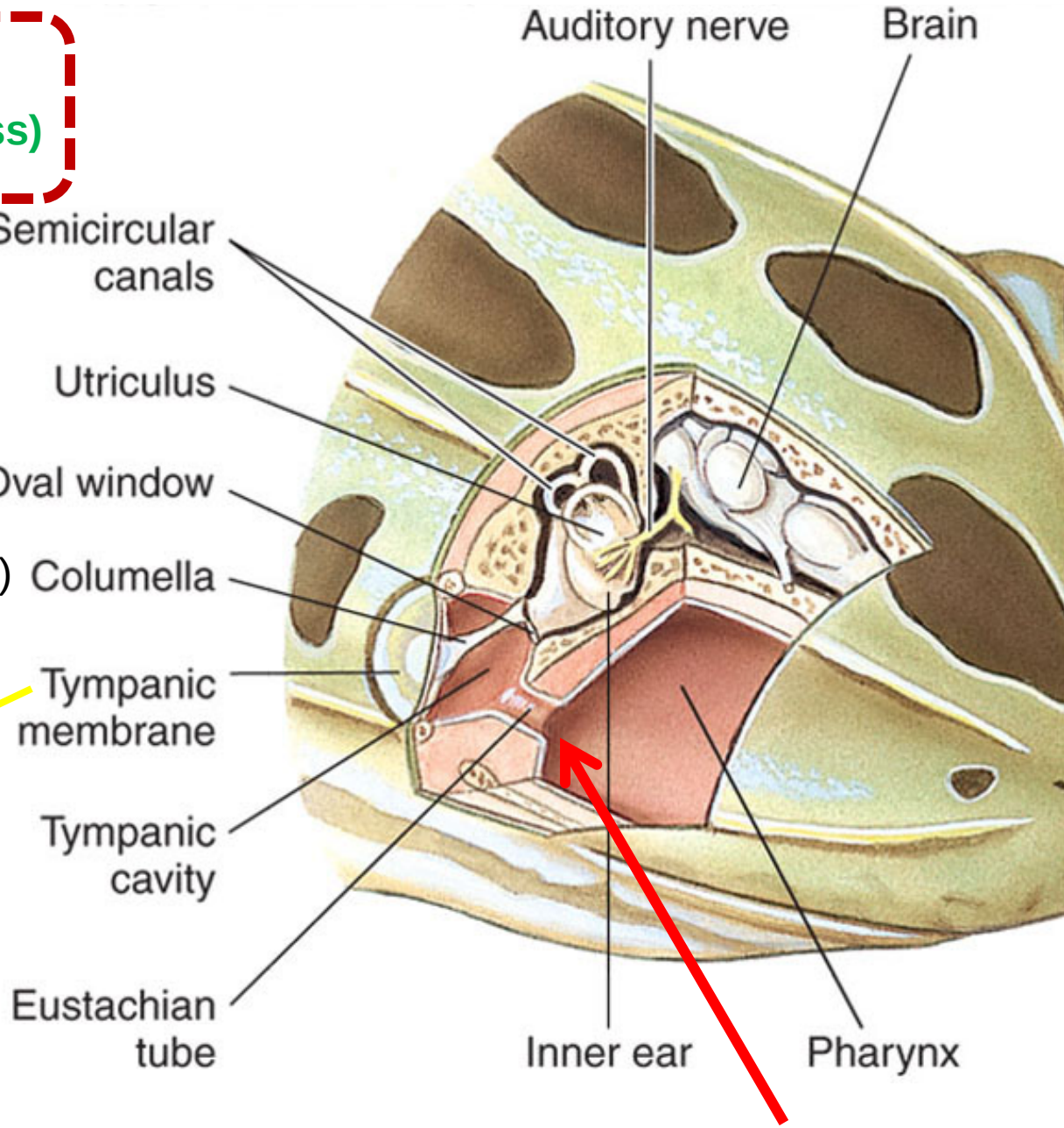


(d)

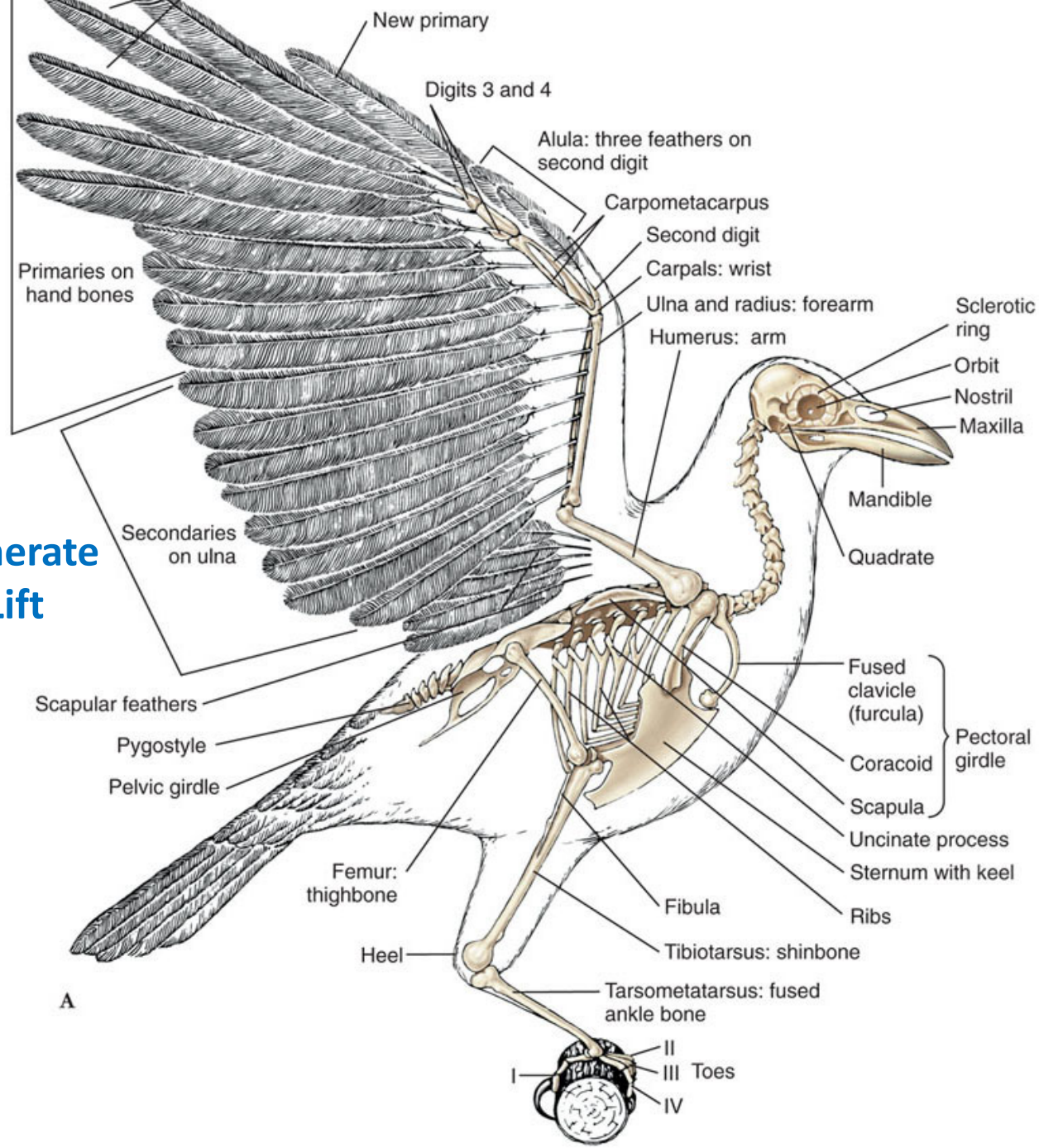
Low-frequency hearing
(< 4000 hz …usually much less)



Flight Feathers

Generate Thrust

Generate Lift

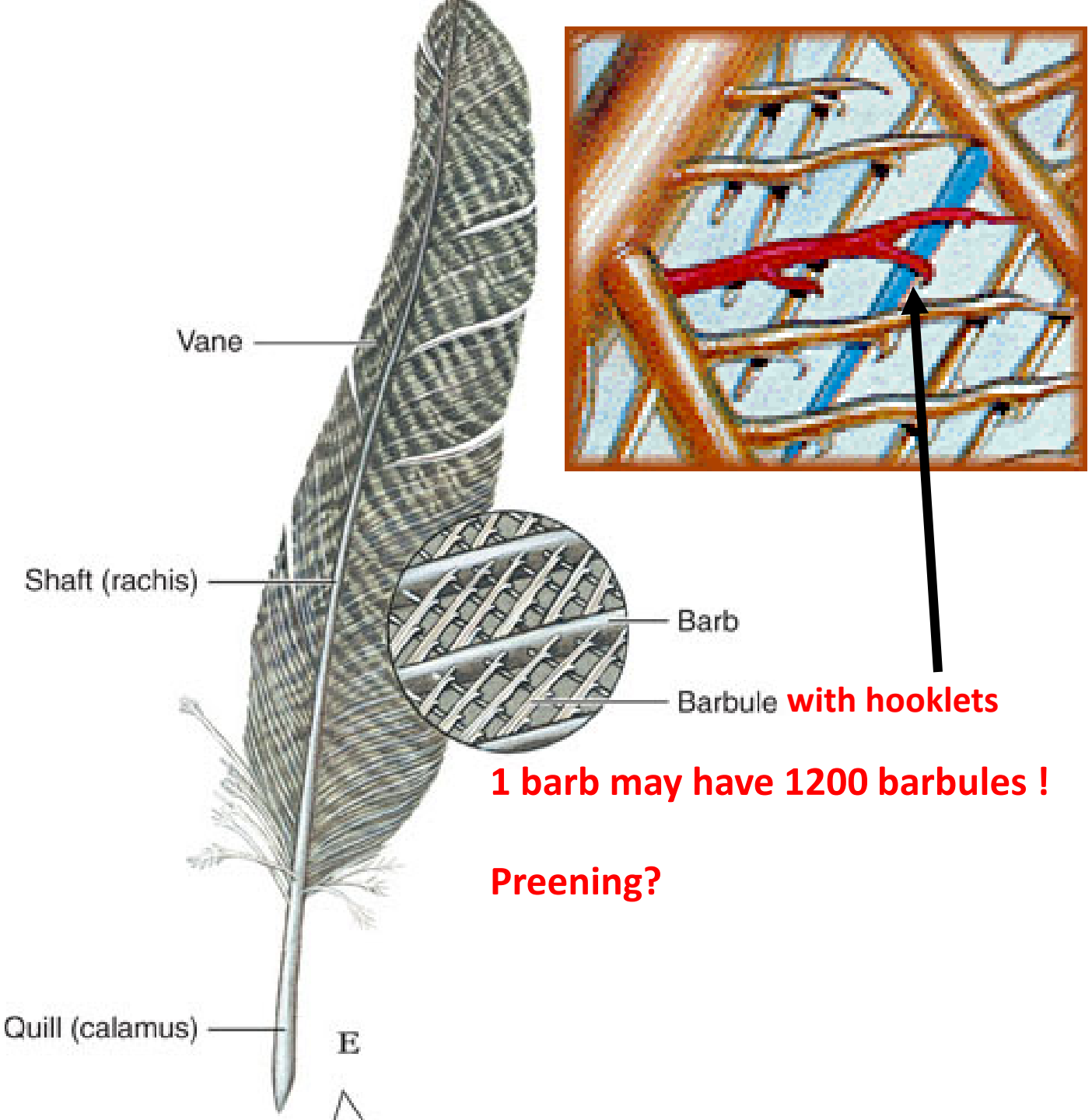


Feather Slides

Contour

Down

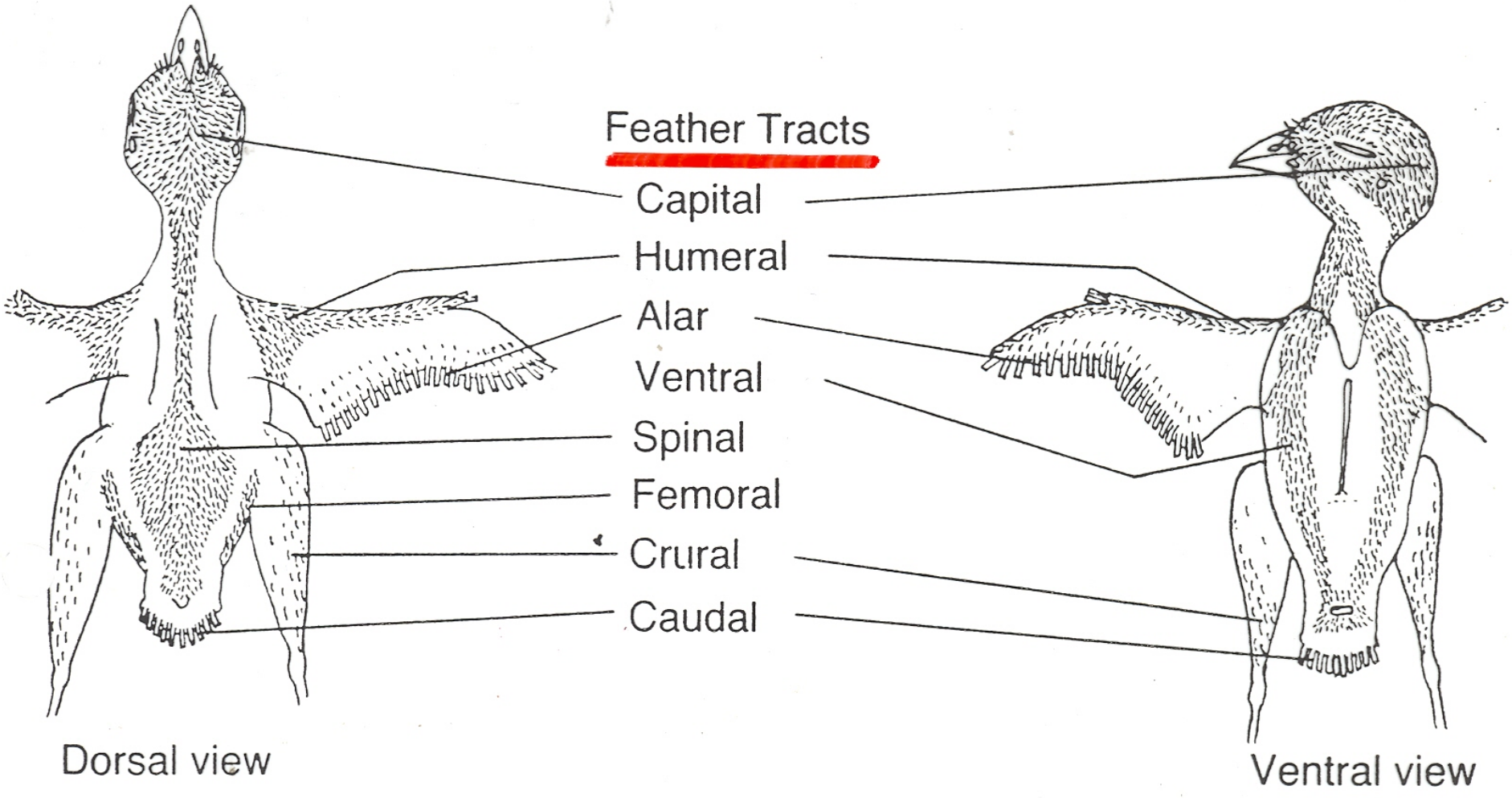
Filoplume

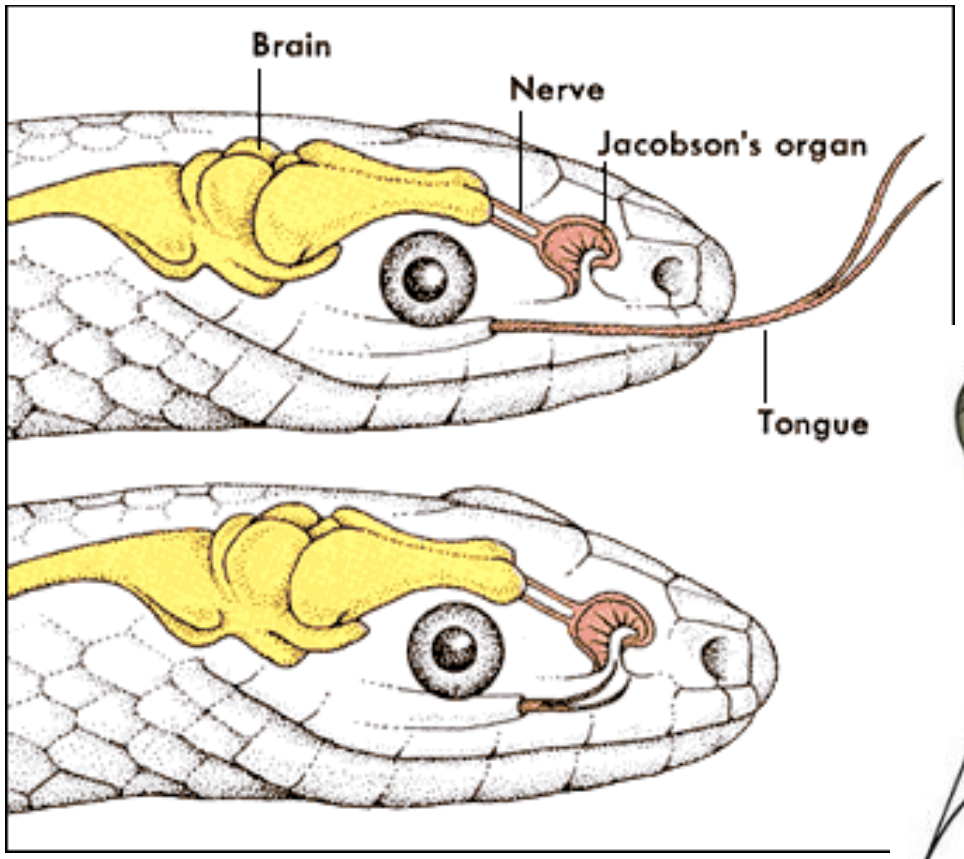


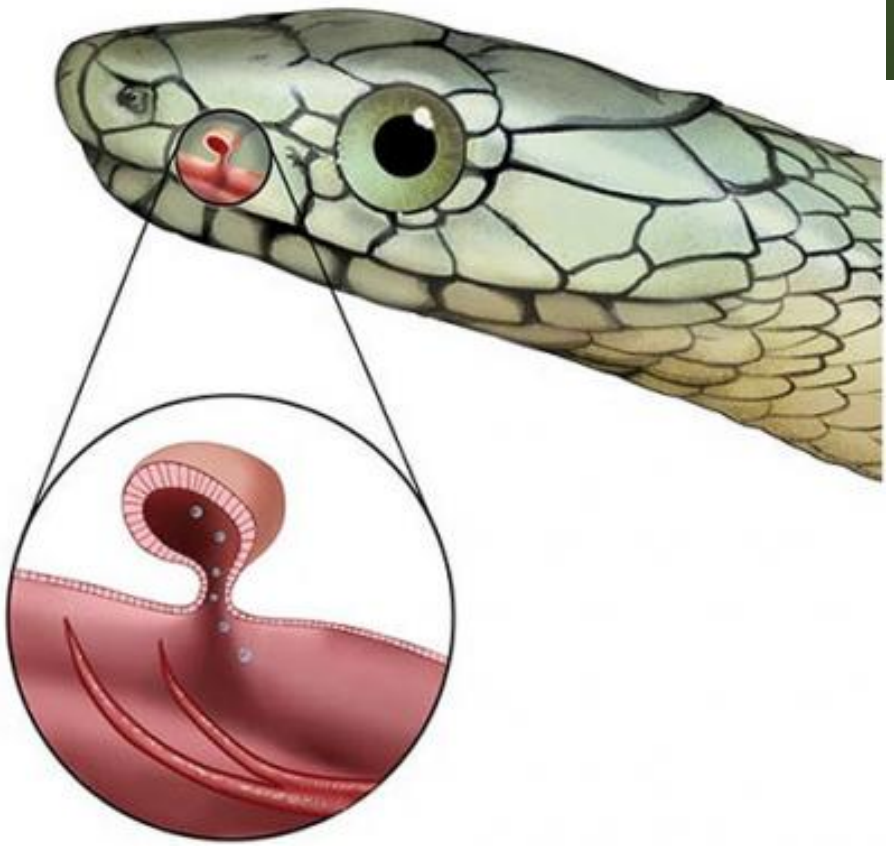
with hooklets

1 barb may have 1200 barbules !

Preening?

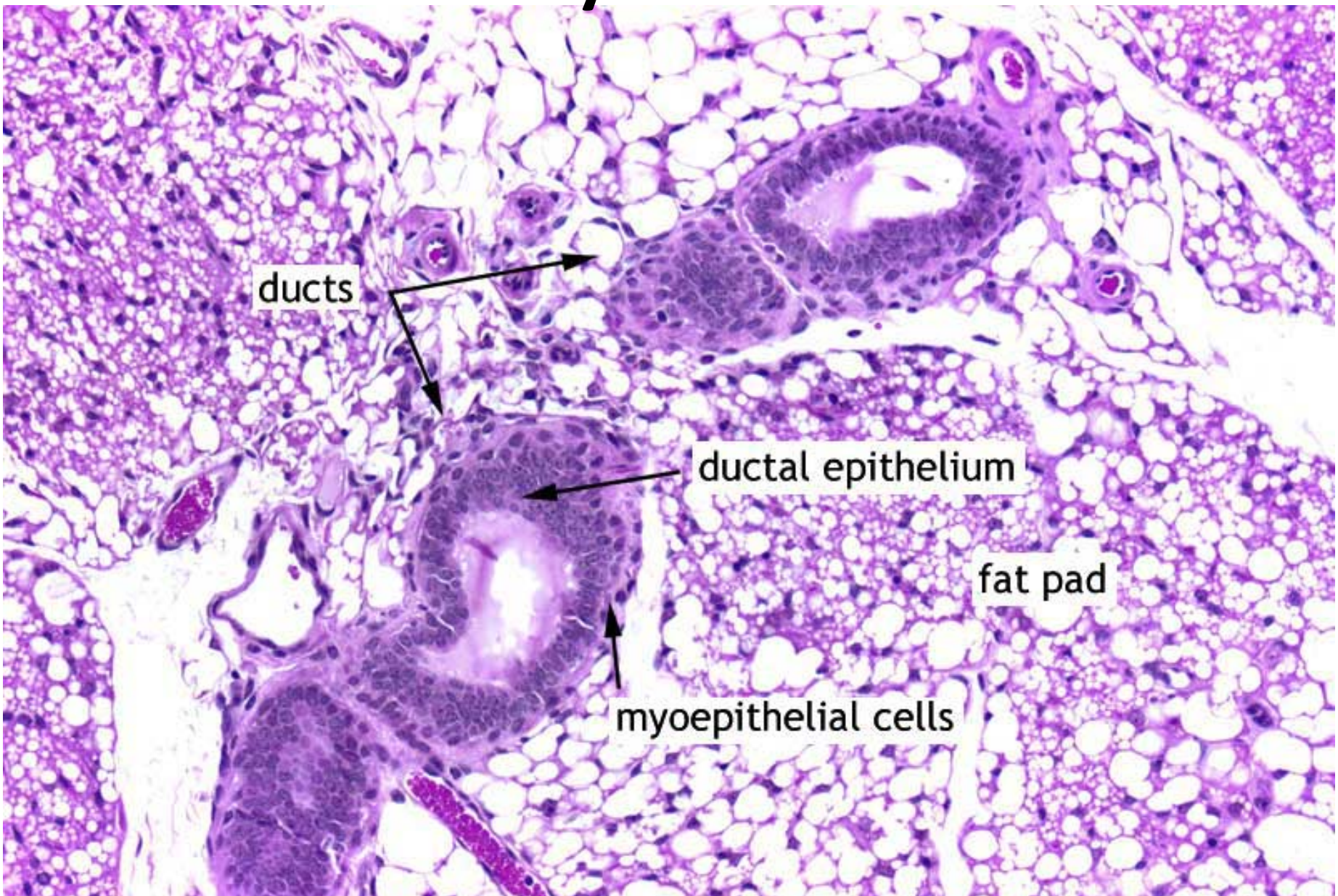

Feather Tracts
Capital
Humeral
Alar
Ventral
Spinal
Femoral
Crural
Caudal
Dorsal view
Ventral view


Brain
Nerve
Jacobson's organ
Tongue




MAMMARY GLANDS

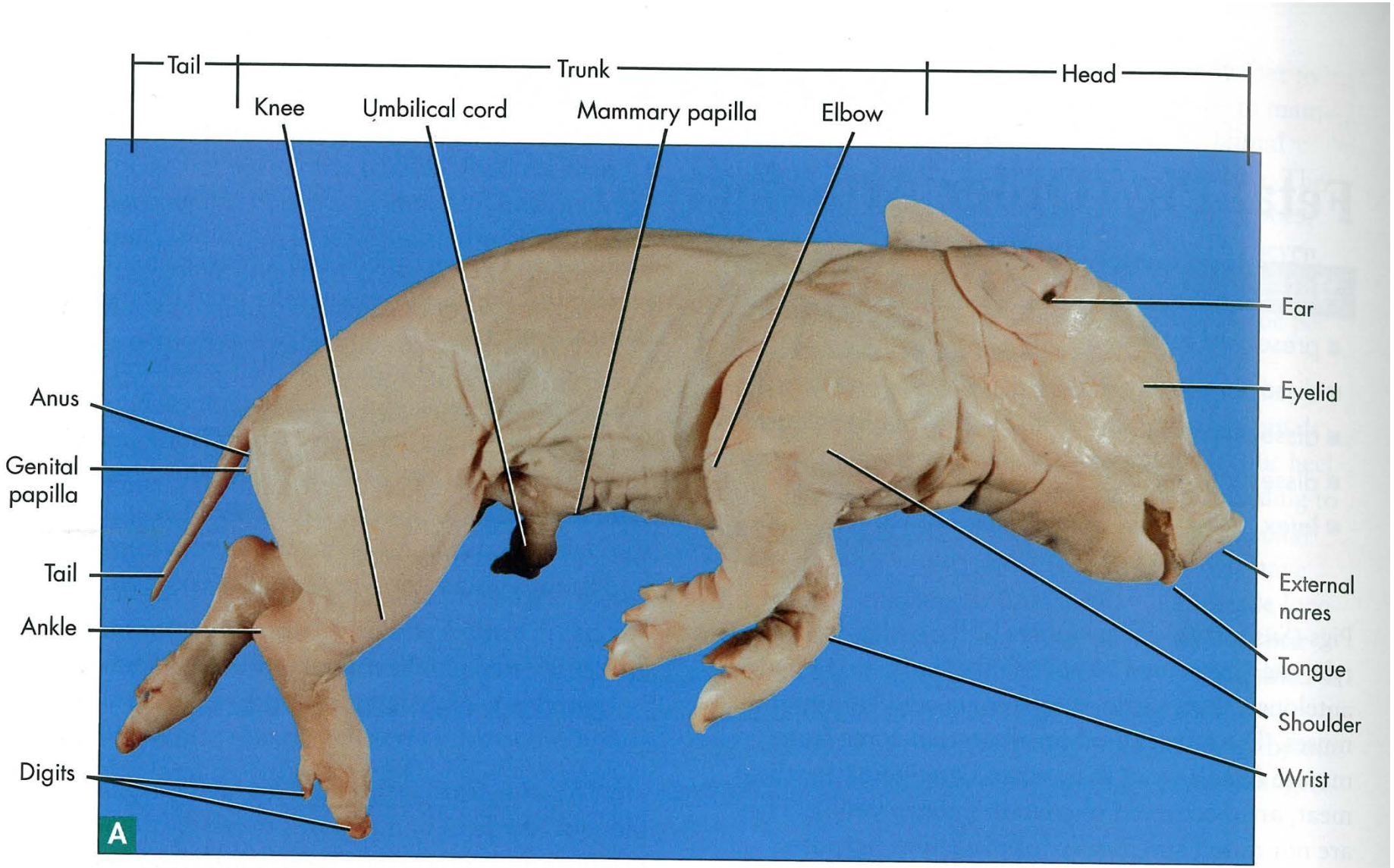
Mammary Gland Tissue

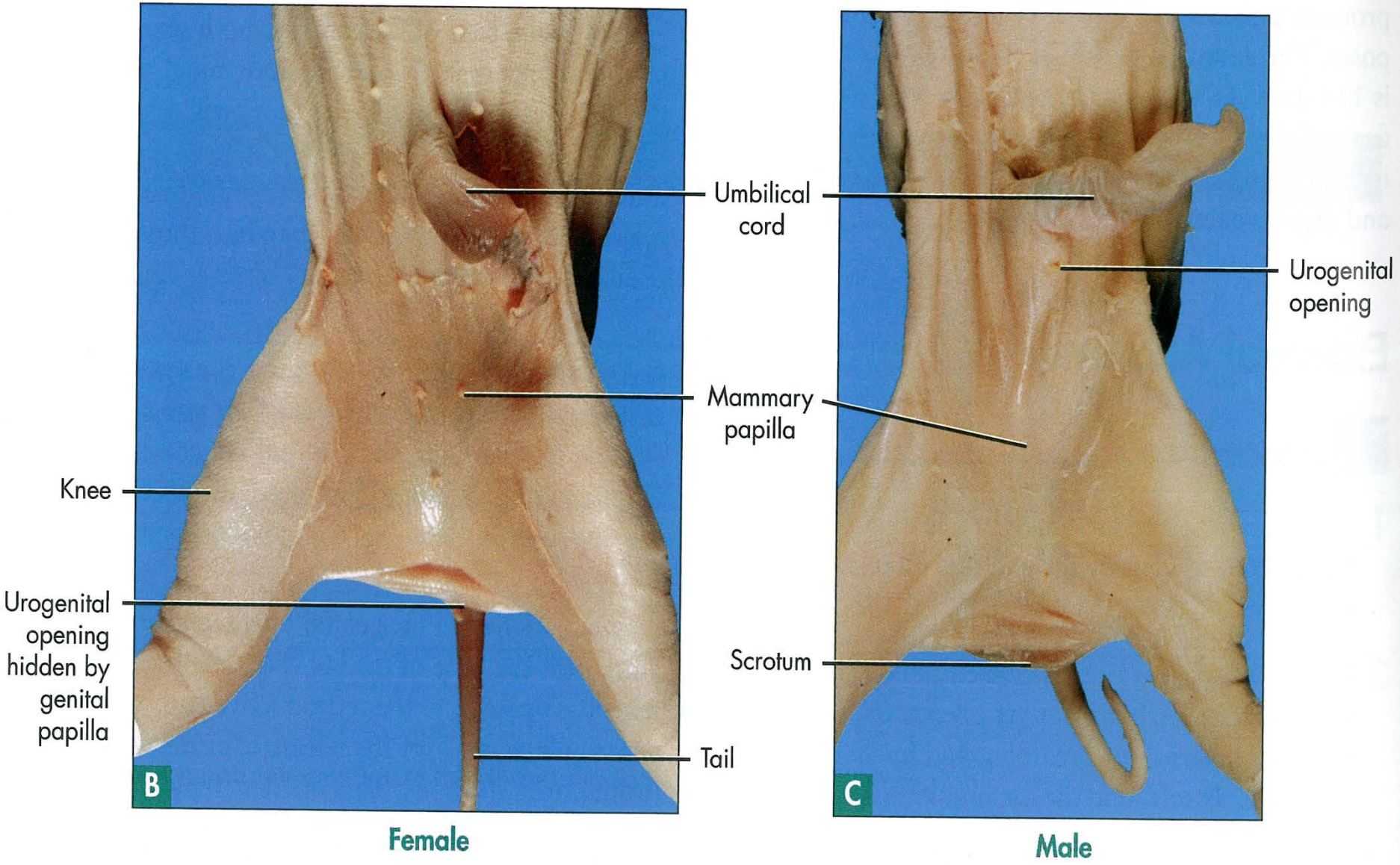


Order Artiodactyla

"even-toed" ungulates (3rd + 4th toes support weight)

deer, giraffes, goats, sheep, cattle, etc.




Umbilical cord
Mammary papilla
Knee
Urogenital opening hidden by genital papilla
Tail
B
Female
Urogenital opening
Scrotum
C
Male

THE END