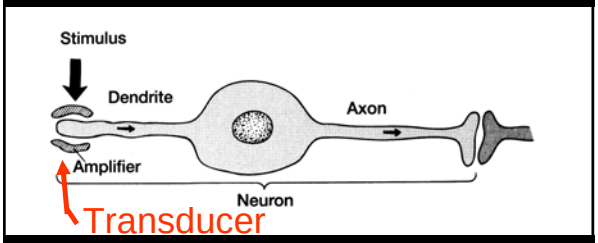
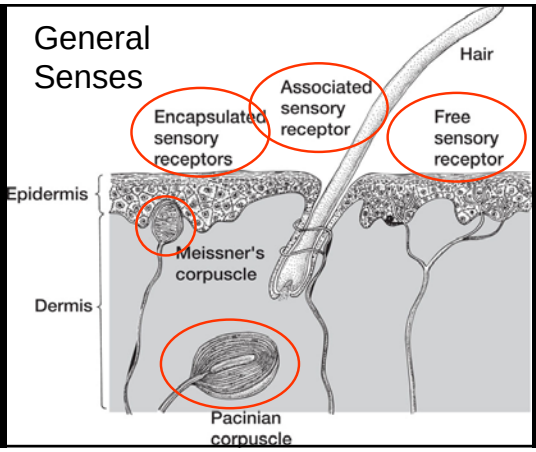
Sensory receptors

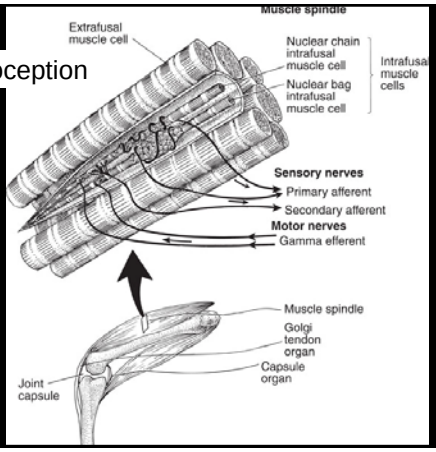
General Sense Organs



General Senses



Proprioception



Law of specific nerve energies

- Meissner's corpuscle
- end-bulb of Krause
- corpuscle of Ruffini

Pattern theory of sensation

Special Sensory Organs (localized)

- **Mechanoreceptors**
- **Chemoreceptors**
- **Photoreceptors**

Mechanoreceptors

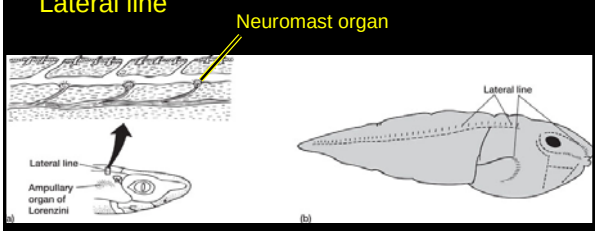
- lateral line
- vestibular system
- auditory system

Mechanoreceptors

- lateral line
- vestibular system
- auditory system

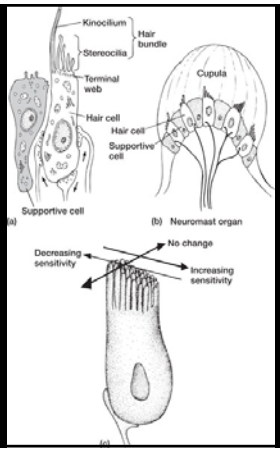
Mechanoreceptor

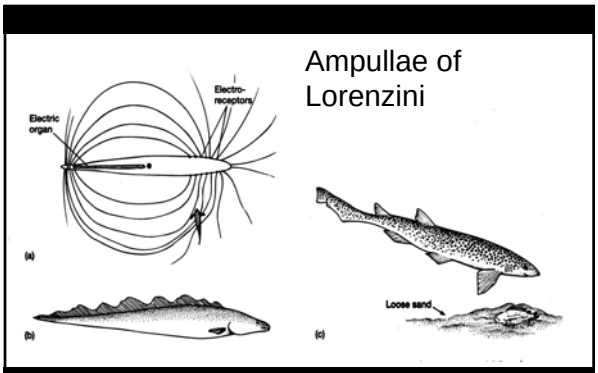
Lateral line



Mechanoreceptors

- Lateral line
- Vestibular
- Auditory



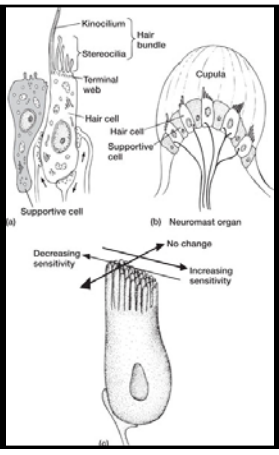


Ampullae of Lorenzini

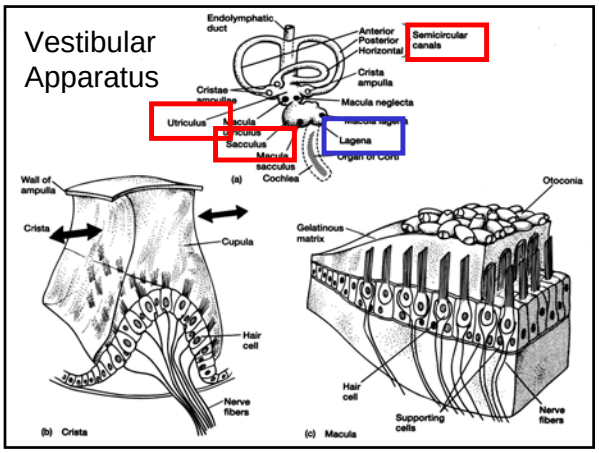
Electroreceptors

Mechanoreceptors

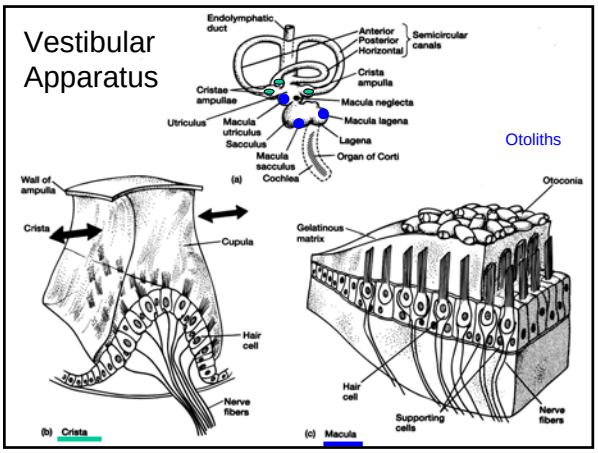
- Lateral line
- Vestibular
- Auditory



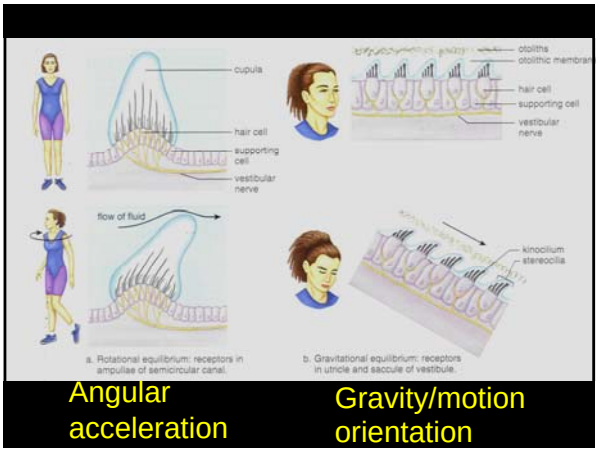
Vestibular Apparatus



Vestibular Apparatus



Otoliths



Angular acceleration

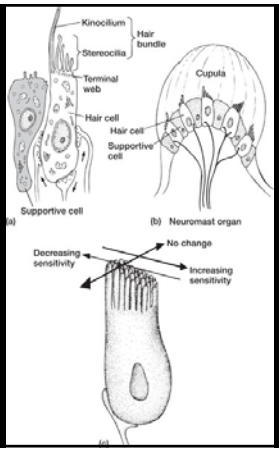
Gravity/motion orientation

Mechanoreceptors

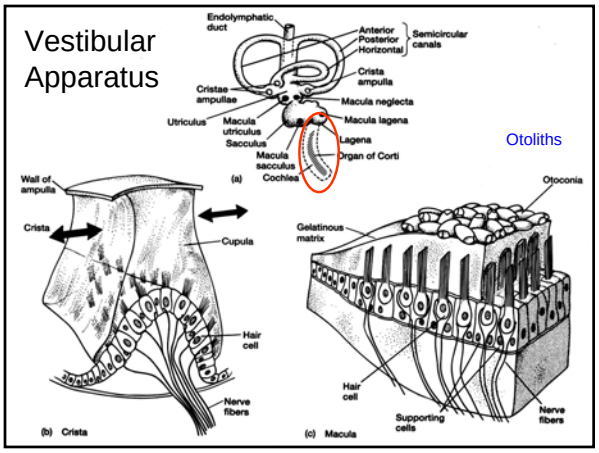
Lateral line

Vestibular

Auditory

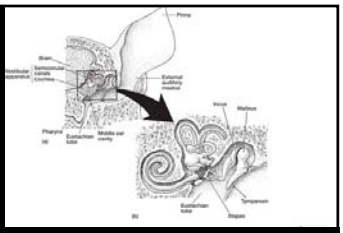


Vestibular Apparatus



Otoliths

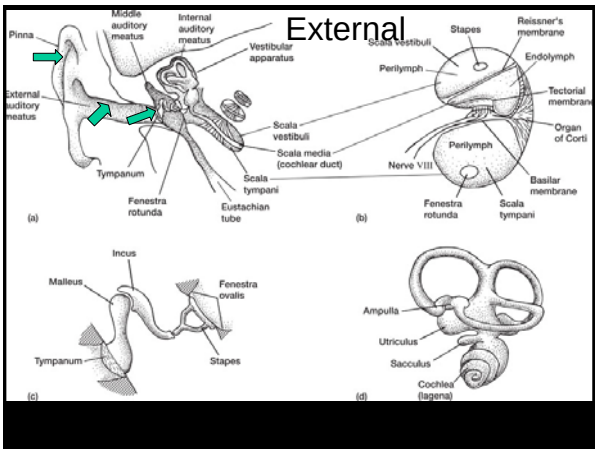
Auditory System



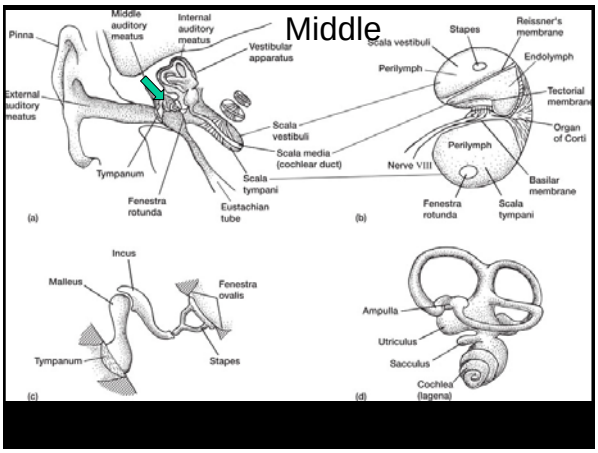
Ear

- Meatuses
  - external
  - middle
  - internal

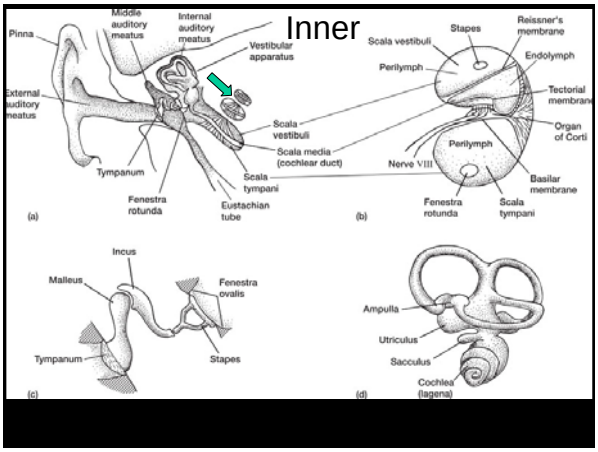
External



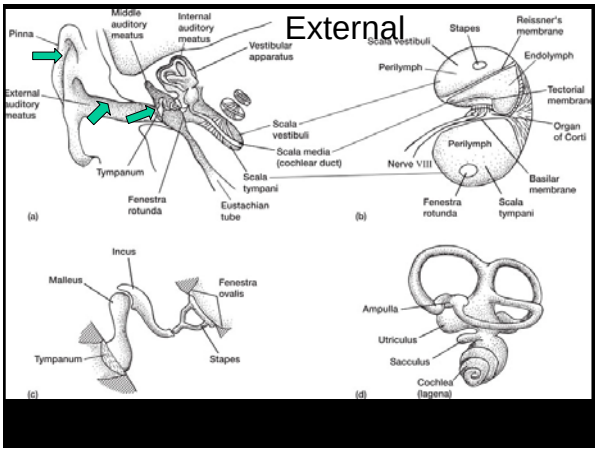
Middle

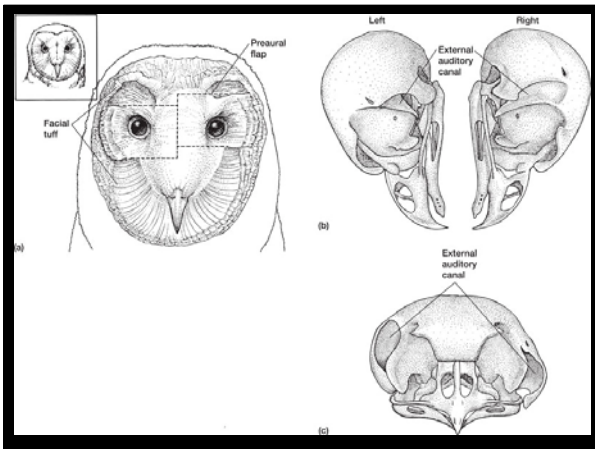


Inner

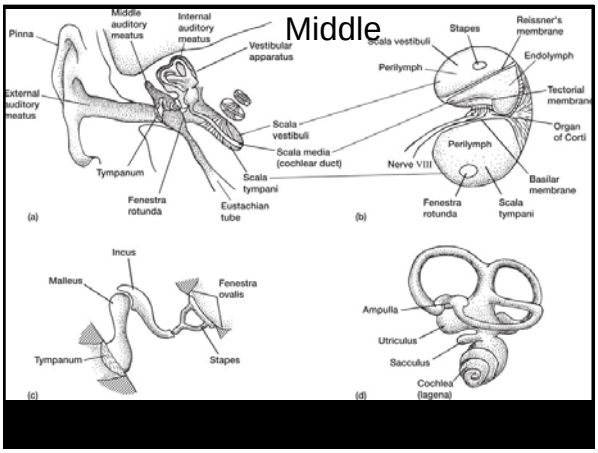


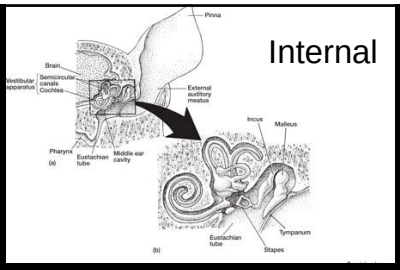
External

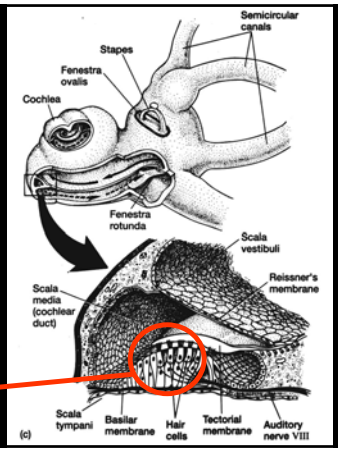


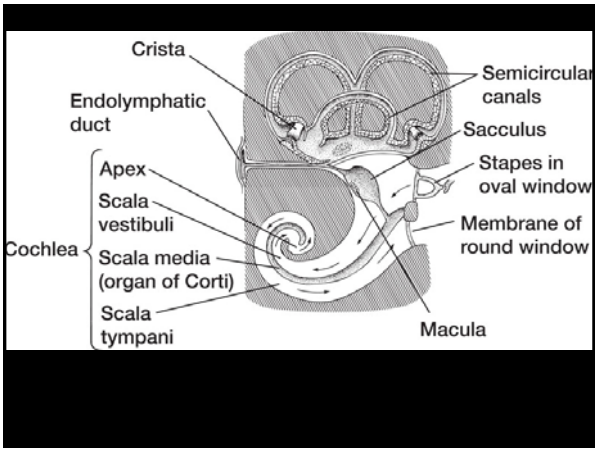


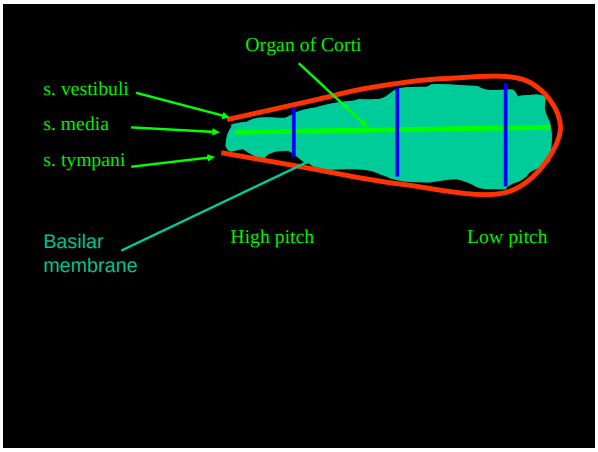
Middle











External Auditory Meatus

- Gather

Middle Auditory Meatus

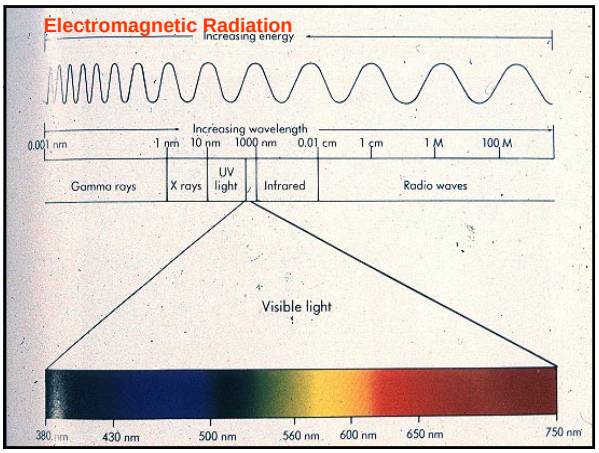
- Transmit
- Transform
- Amplify

Internal Auditory Meatus

- Detect

Special Sensory Organs (localized)

- **Mechanoreceptors**
- **Radiation Receptors**
- **Chemoreceptors**

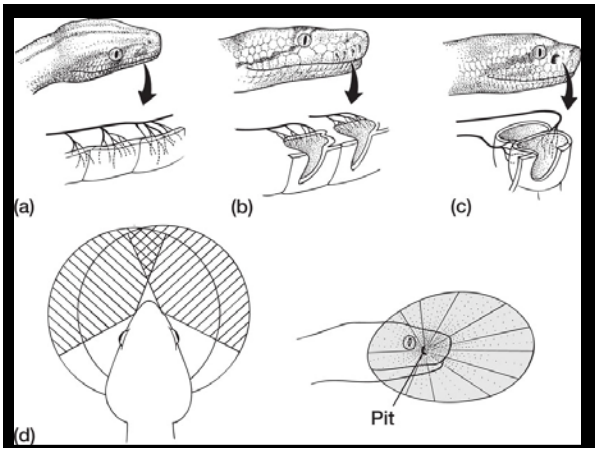


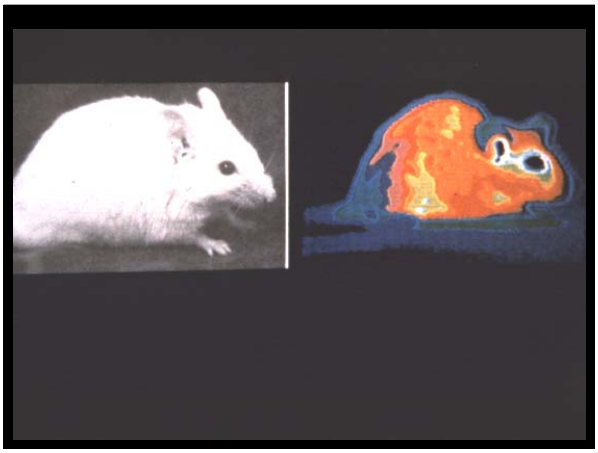
Sensory Systems

- **Radiation receptors**

  Photoreceptors

  Infrared receptors



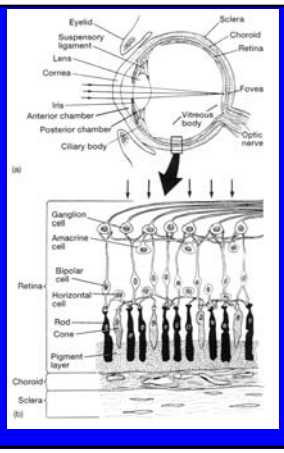


Eye

- **sclera**
  - scleral ossicles
  - cornea
- **choroid**
  - vascular
  - iris
  - ciliary body—lens
  - tapetum lucidum
- **retina**
  - rods and cones

(B&W) Color

Chambers



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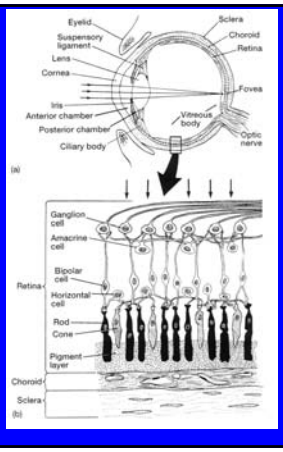
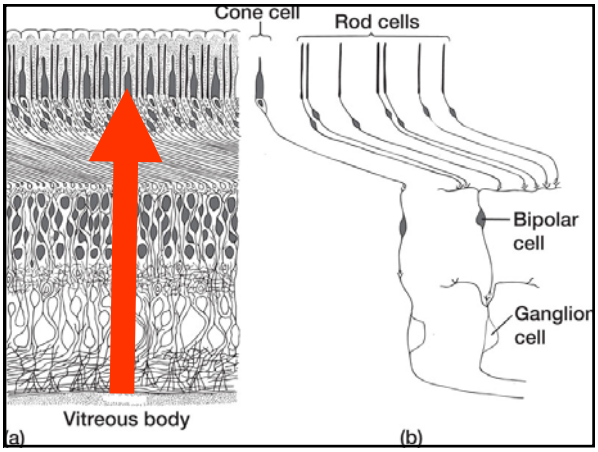
  - vascular
  - iris
  - ciliary body—lens
  - tapetum lucidum
- **retina**
  - rods and cones

(B&W) Color

Chambers



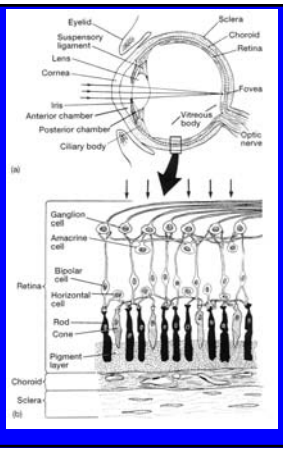


Eye

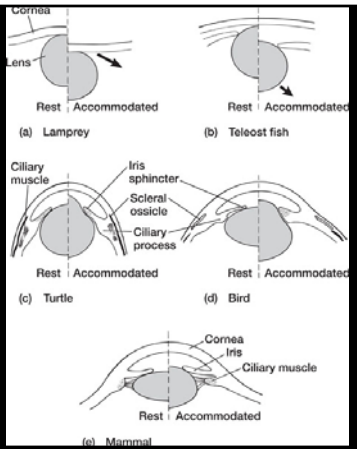
- **sclera**
  - scleral ossicles
  - cornea
- **choroid**
  - vascular
  - iris
  - ciliary body—lens
  - tapetum lucidum
- **retina**
  - rods and cones

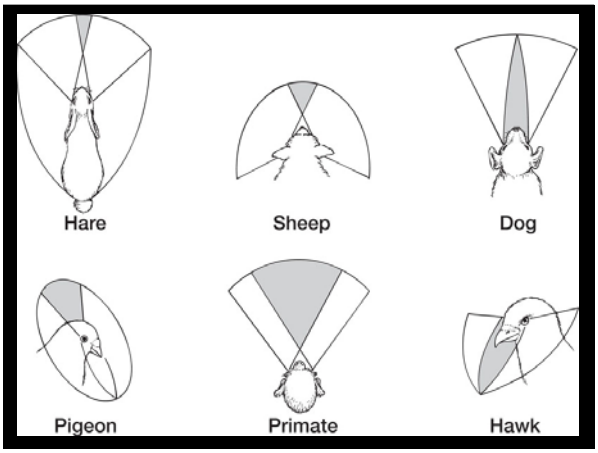
(B&W) Color

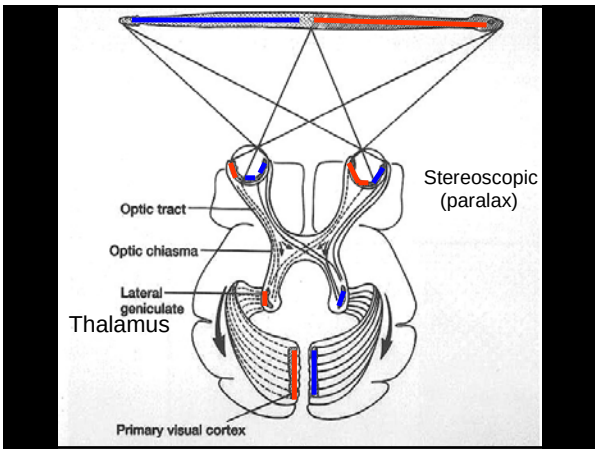
Chambers



Accommodation

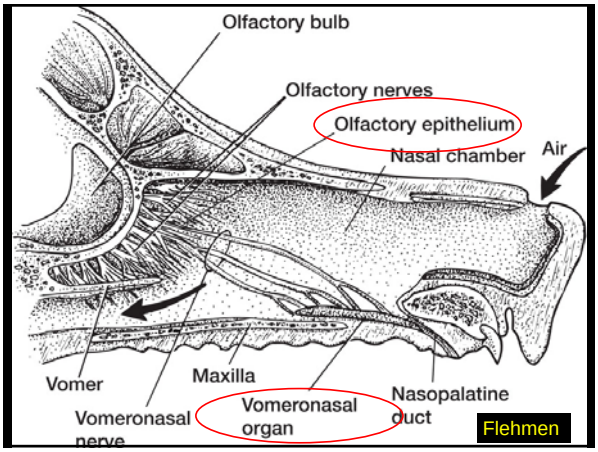




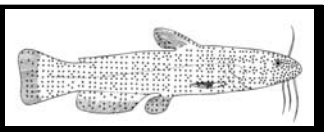


Special Sensory Organs (localized)

- **Mechanoreceptors**
- **Radiation receptors**
- **Chemoreceptors**



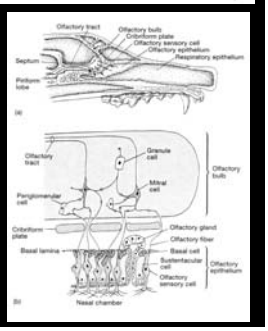
Chemoreception

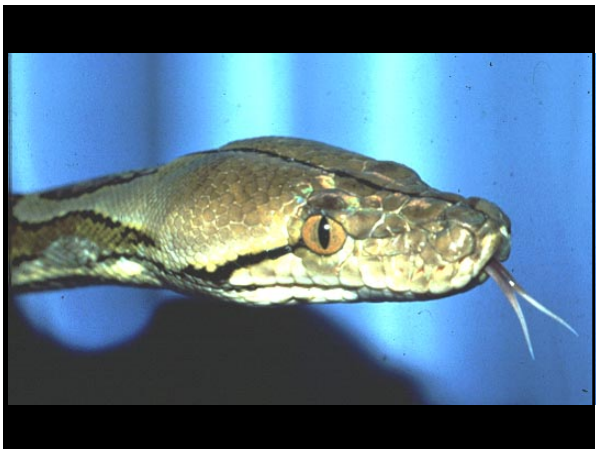


"Taste"

Smell

- -olfactory epithelium
- -vomeronasal organ





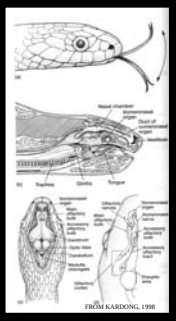
Sensory Systems

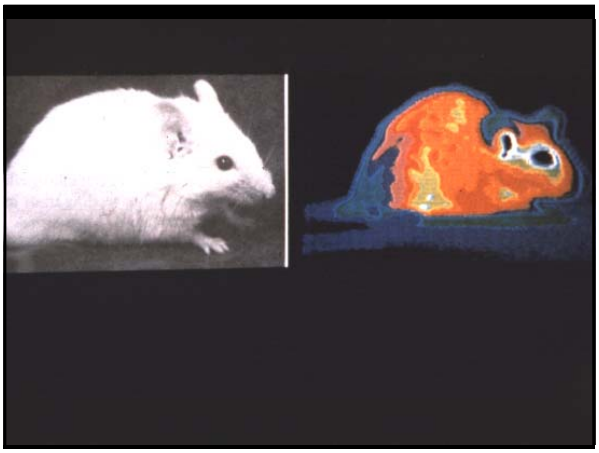
- **Chemosensory receptors**

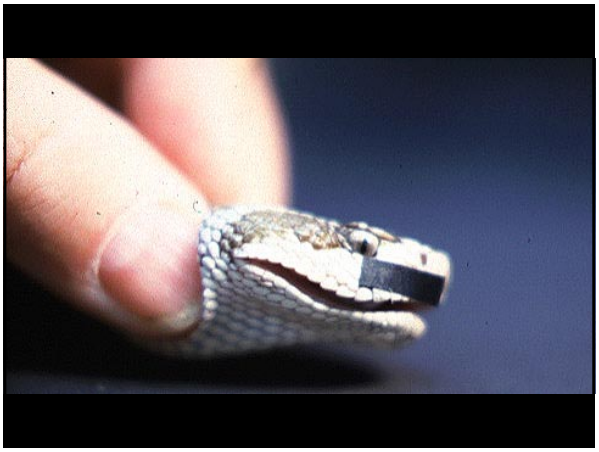
  Olfactory epithelium

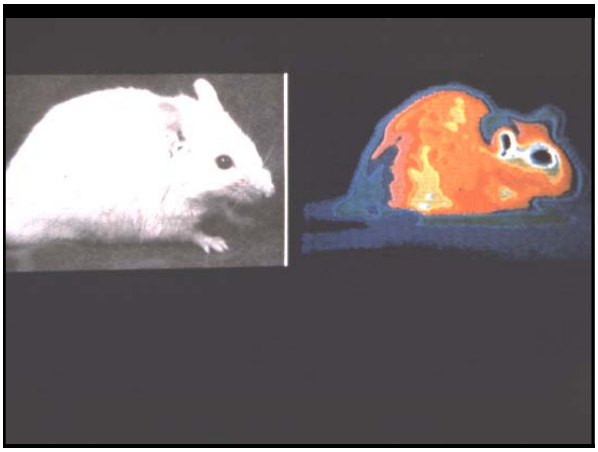
  Vomeronasal organ

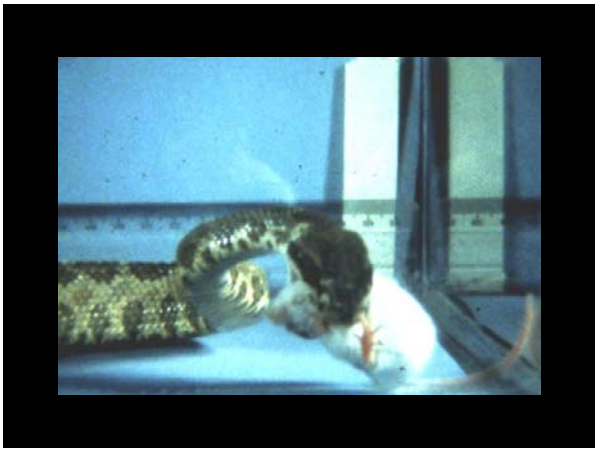
  (=Jacobsen's organ)

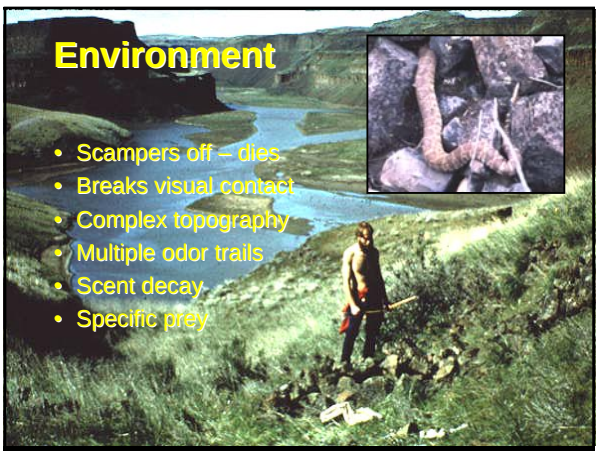


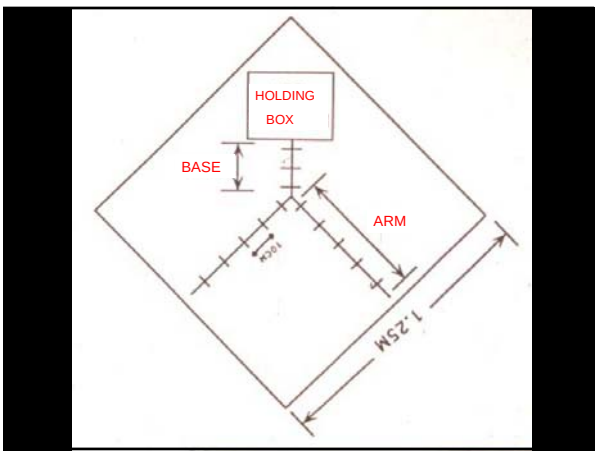


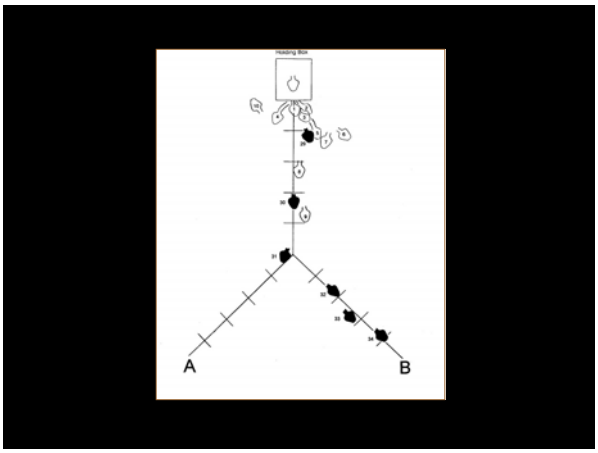


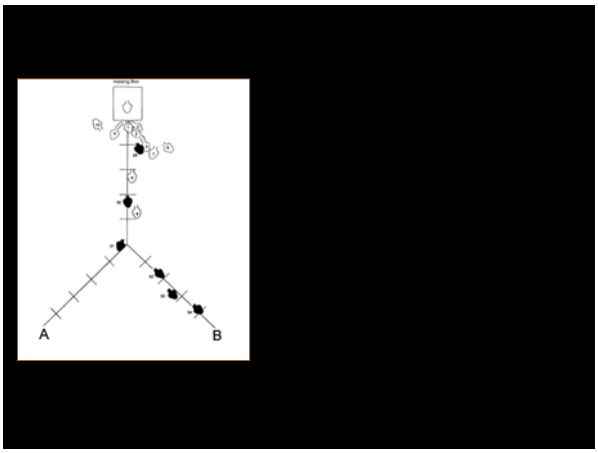




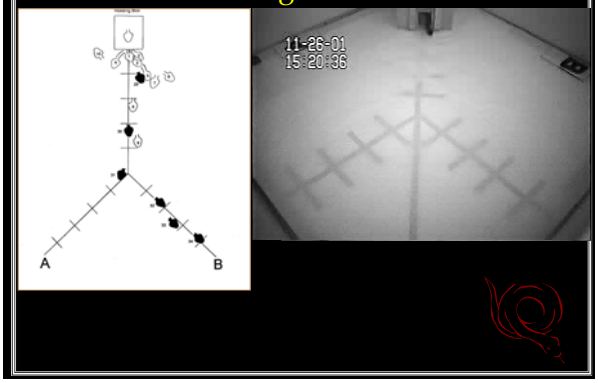

Environment
• Scampers off – dies
• Breaks visual contact
• Complex topography
• Multiple odor trails
• Scent decay
• Specific prey


HOLDING
BOX
BASE
ARM
1.25M





Poststrike Trailing

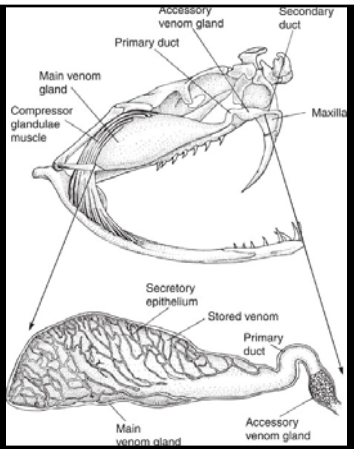


1) Sn Struck > Unstruck
(venom) (no venom)
same/different
Memory Venom > Mouse Odor

2) Sn Struck > Unstruck
(no venom) (no venom)

3) Sn Struck ≥ Hand Struck
(no venom) (no venom)

different mice: YES
same mouse: NO Mouse Odor > Fang Puncture



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3) Sn Struck ≥ Hand Struck
(no venom) (no venom)

different mice: YES
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1) Sn Struck > Unstruck
(venom) (no venom)
same/different
Memory Venom > Mouse Odor

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different mice: YES
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1) Sn Struck > Unstruck
(venom) (no venom)
same/different
Memory Venom > Mouse Odor

2) Sn Struck > Unstruck
(no venom) (no venom)

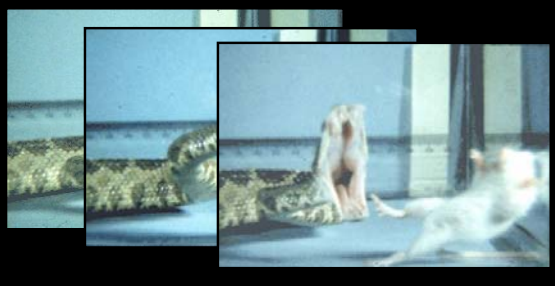
3) Sn Struck ≥ Hand Struck
(no venom) (no venom)

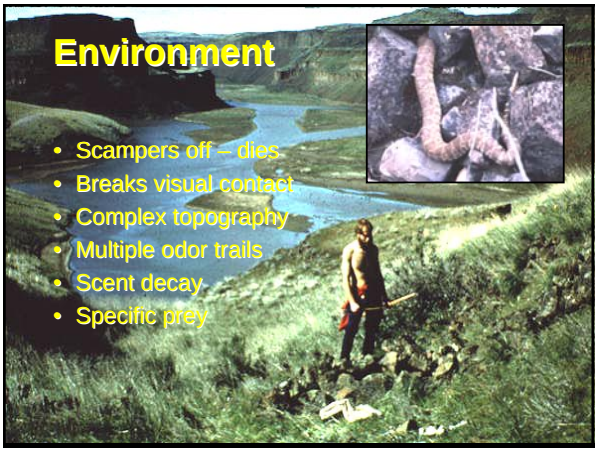
different mice: YES
same mouse: NO Mouse Odor > Fang Puncture

4) Venom > Mouse Odor > Fang

Conclusion

- Rattlesnakes strike and release their prey





Sensory Systems

1) Radiation Receptors: Prestrike/Strike

Eyes ⟷ Facial Pits

2) Chemosensory Receptors: Poststrike

Selective

Priority: Venom>Mouse>Fang

Chemical profile

Memory