

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



**Benha University**  
**Faculty of Vet Medicine**  
**Histology Dept.**



# **NERVOUS SYSTEM**

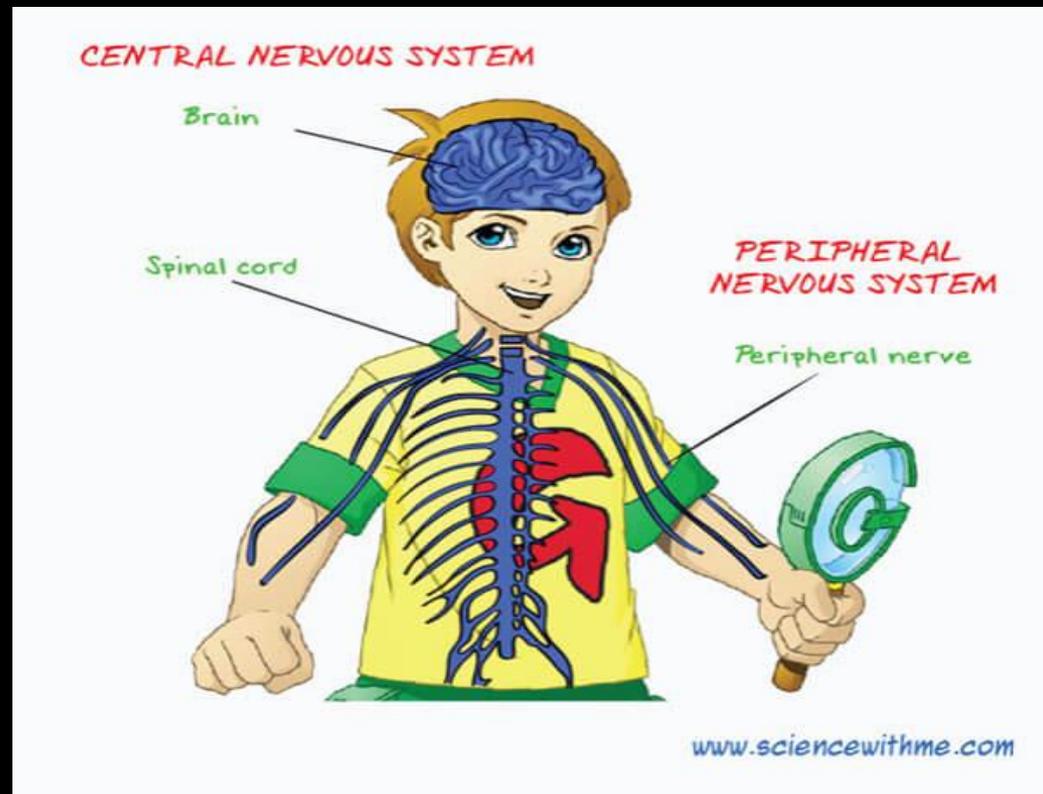
**First year – Second semester**

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# ■ NERVOUS SYSTEM



## ***A- Peripheral NS (PNS)***

- 1- Peripheral ganglia
- 2- Peripheral nerves
- 3- P nerve endings

## ***B- Central NS (CNS)***

- 1- cerebrum
- 2- cerebellum
- 3- Spinal cord



# Peripheral Nervous System



# Peripheral Ganglia



## ■ *Peripheral ganglia*

- This is collection of nerve cells bodies outside the CNS.
- There are **2 types** according to basis of morphology & function

1-Cerebrospinal ganglia

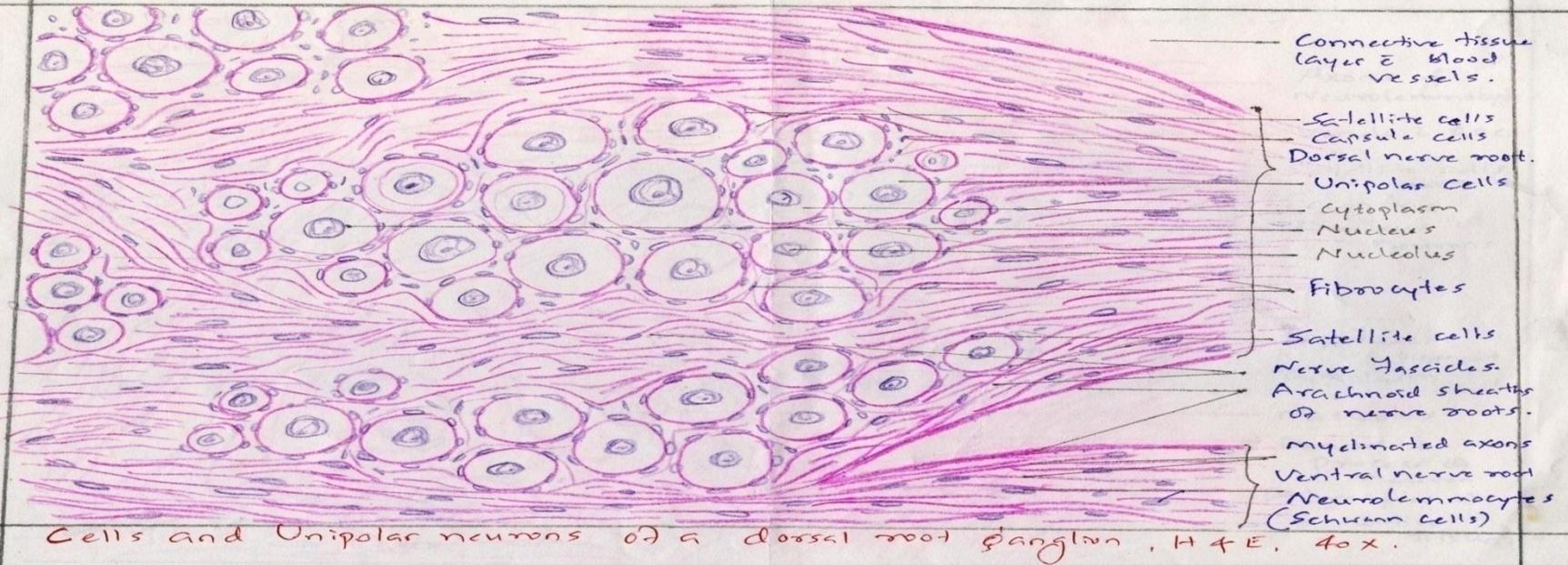
2- Autonomic ganglia



## ■ *Cerebrospinal Ganglia*

- It includes cerebral and spinal ganglia.
- present on the
  - 1- Dorsal root of the spinal nerve.
  - 2- Sensory branch of the cranial nerve.





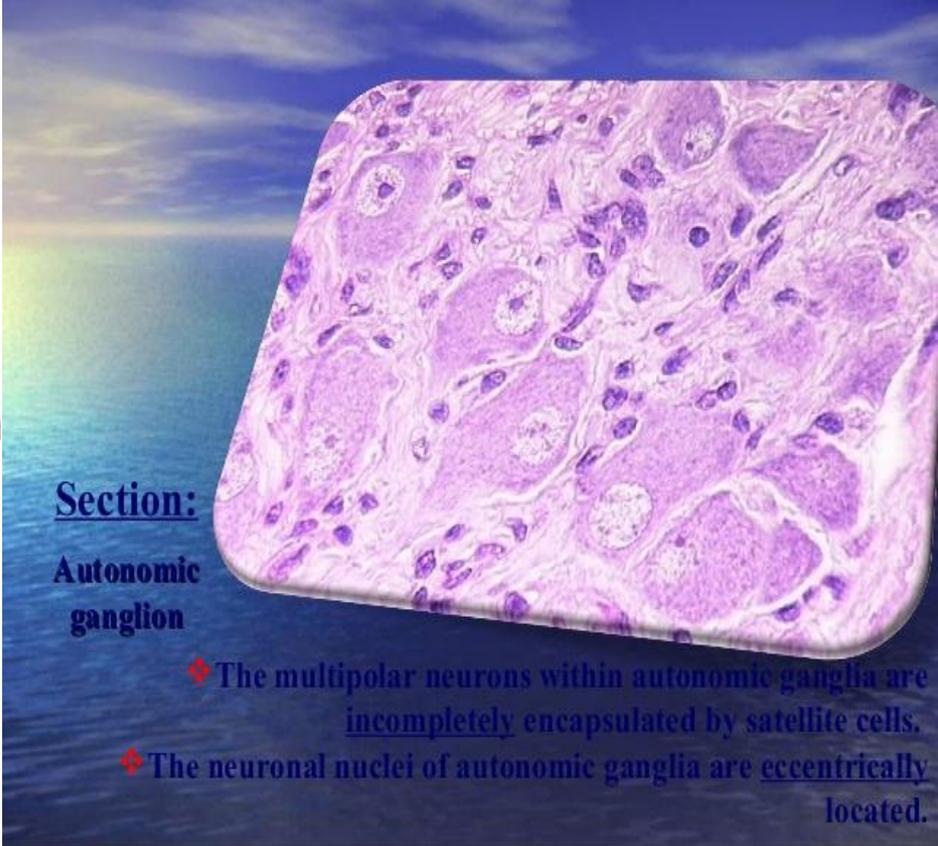
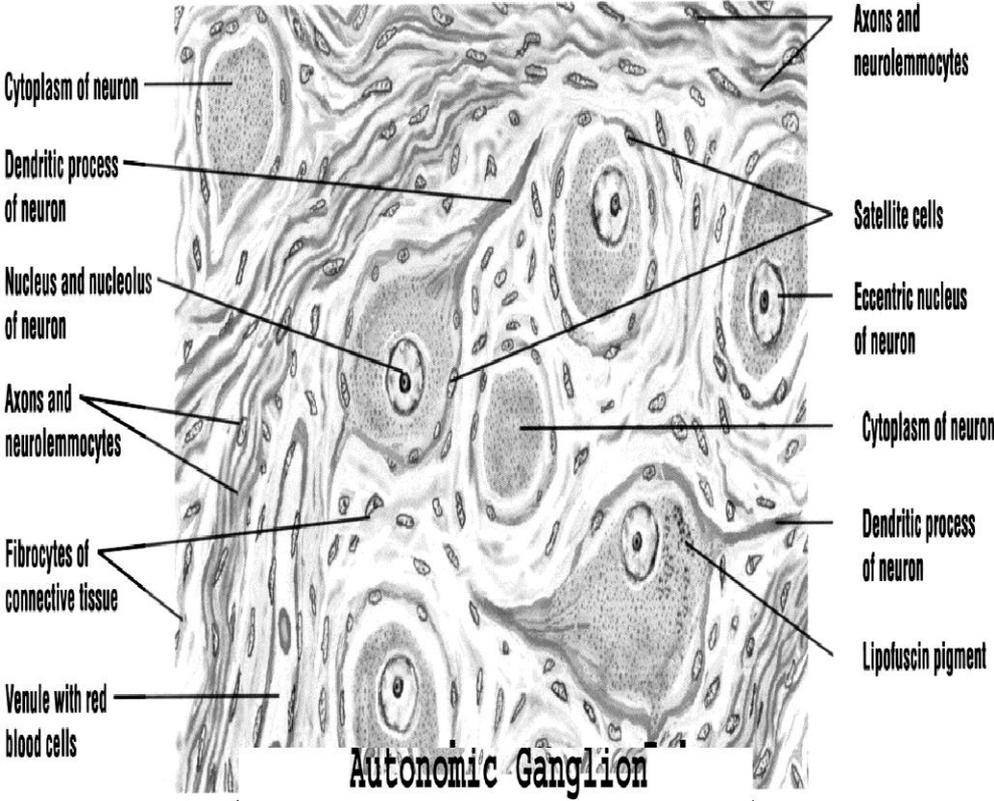
- Pseudounipolar n. cell " surrounded with capsular cells
- the cells gathered in groups
- nerve fiber "myelinated nerve fiber
- Delicate C.T capsule covering derived from endoneurium of the nerve fiber



## ▪ *Autonomic Ganglia*

- Appear bulbous dilatation in the autonomic nerves.
- It is located in the wall of certain organs (**intramural ganglia**).
- intramural ganglia which is **devoid** of C.T capsule





- Multipolar n. cell “ surrounded with ill-defined capsular cells
- No groups
- nerve fiber “unmyelinated nerve fiber
- Absent CT capsule



# Peripheral Nerve endings



## Nerve endings



Effectors



Receptors

- 1-motor end plate
- 2-secretory endings



# ■ *Receptors*



- **Classification of Receptors According To Structure Basis**

1. **Free, diffuse, non-encapsulated**

2. **Encapsulated**

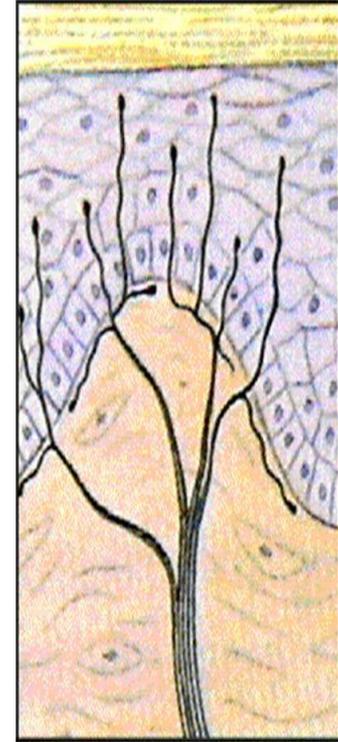


# Free, diffuse, non-encapsulated

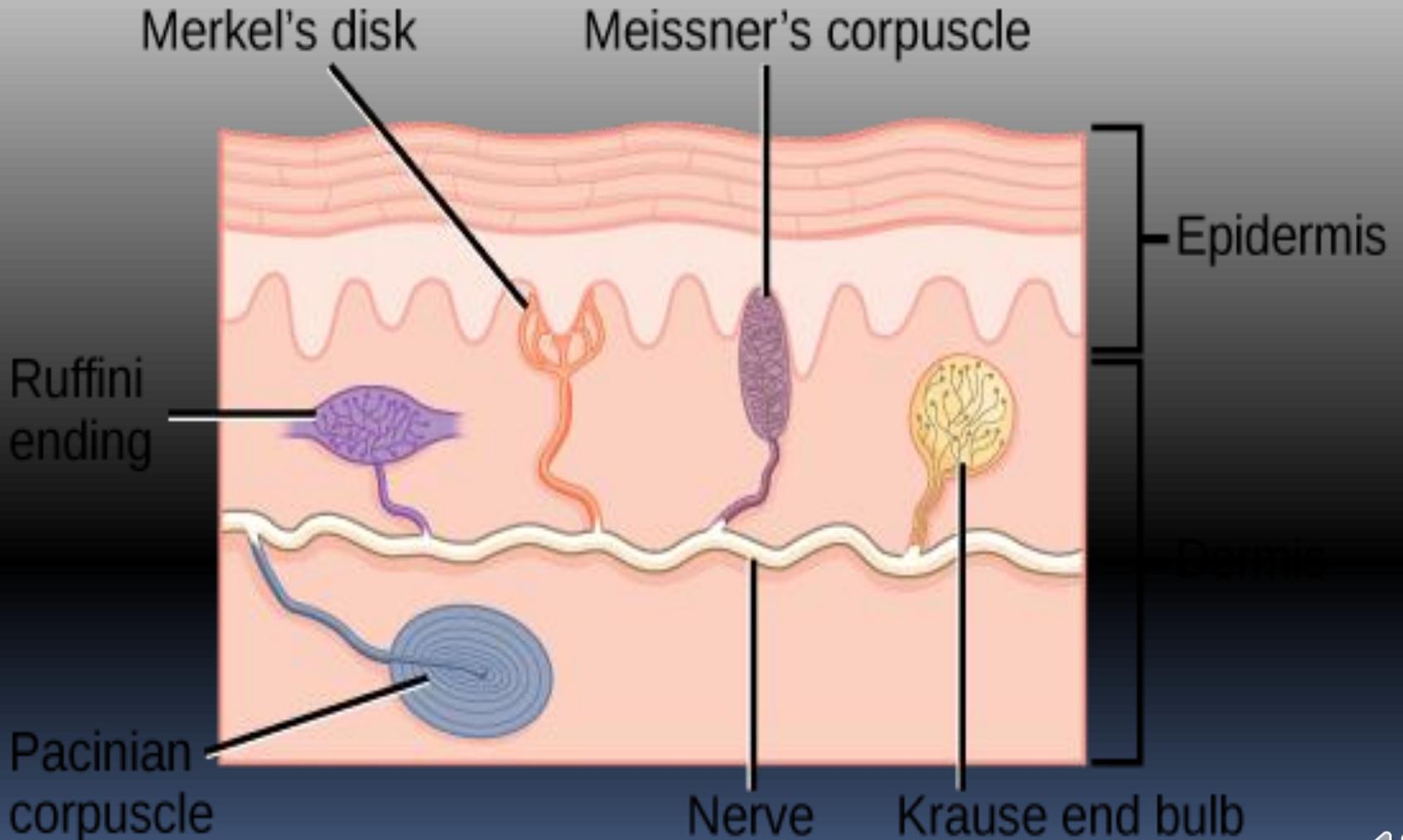
## *Free nerve endings*

- They are present in:
  1. epidermis
  2. serous and mucous membrane
  3. Ms, joints, viscera
- Fine naked nerve penetrate & end freely
- Free nerve ending ramify also in
- Function: pain sensation

1. A. **Free nerve endings** – pain, thermal receptors



# Encapsulated Receptors

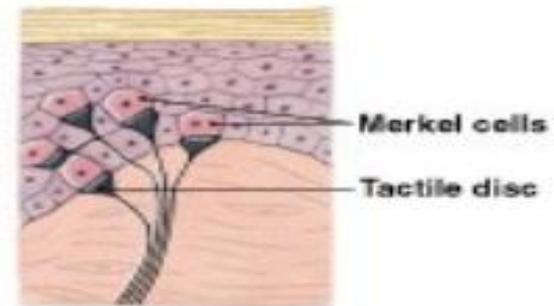


# Encapsulated Receptors

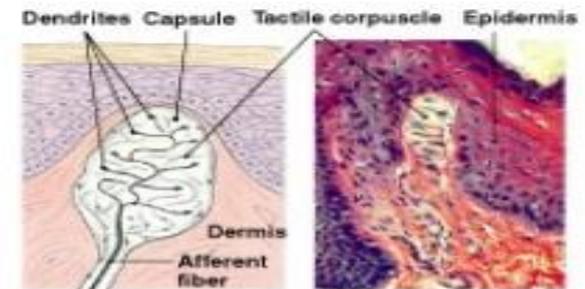
## Merkel's disks

- Modified free nerve ending
- Present in deep epidermal cells & hair less skin
- Terminal branch are flatten or disc like
- *Function* → *tactile stimulation which is pain associated*

## Tactile Receptor



(c) Merkel cells and tactile discs



(d) Tactile corpuscle

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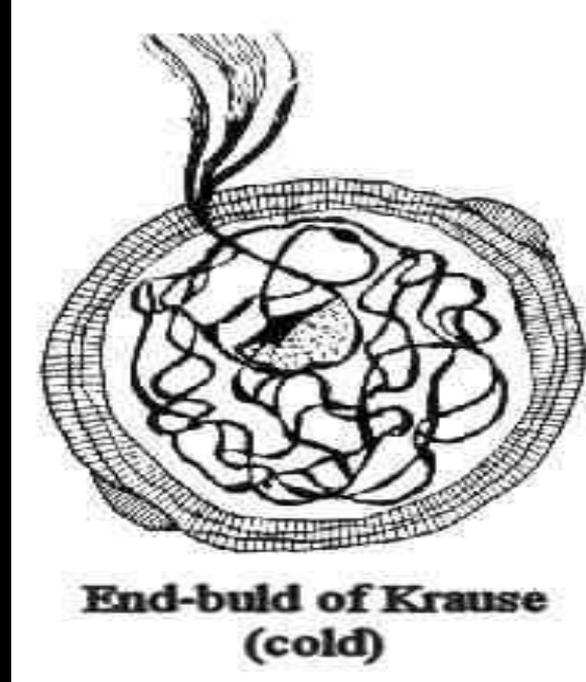
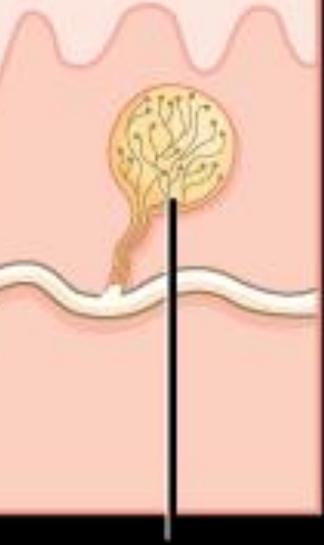
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# Encapsulated Receptors

## ***Bulb of Krause (Krause end bulb)***



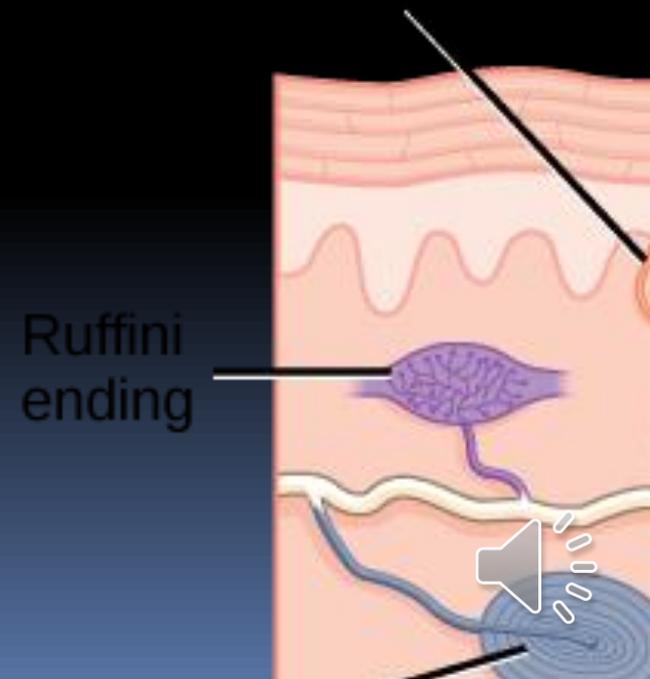
- It located in Skin & associated mm.
- spherical
- The nerve terminal enters granular mass & undergo arborization & expanded ending
- Function → *responsible for cold sensation*



# Encapsulated Receptors

## *Ruffini corpuscle*

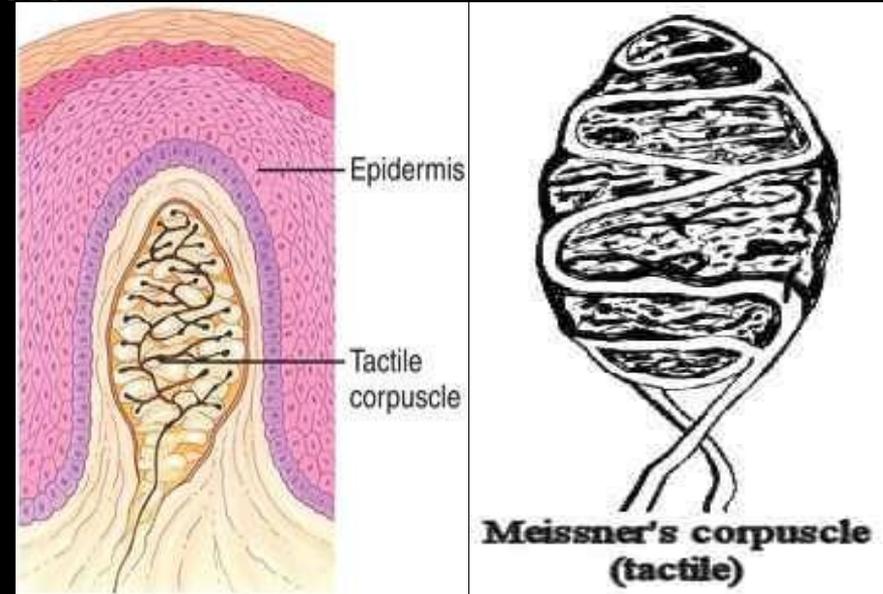
- It is arborization of interlacing nerve through granular mass which enclosed by CT capsule.
- *Function* → *heat receptor*



# Encapsulated Receptors

## *Meissner's Corpuscle*

- One of the most widely spread corpuscle in hairless skin
- occur in dermal papillae in sole and palm.



- In terminal end one or more nerve arranged in helical order around a mass of cell similarly arranged
- *Function* → *touch (tactile) receptors*



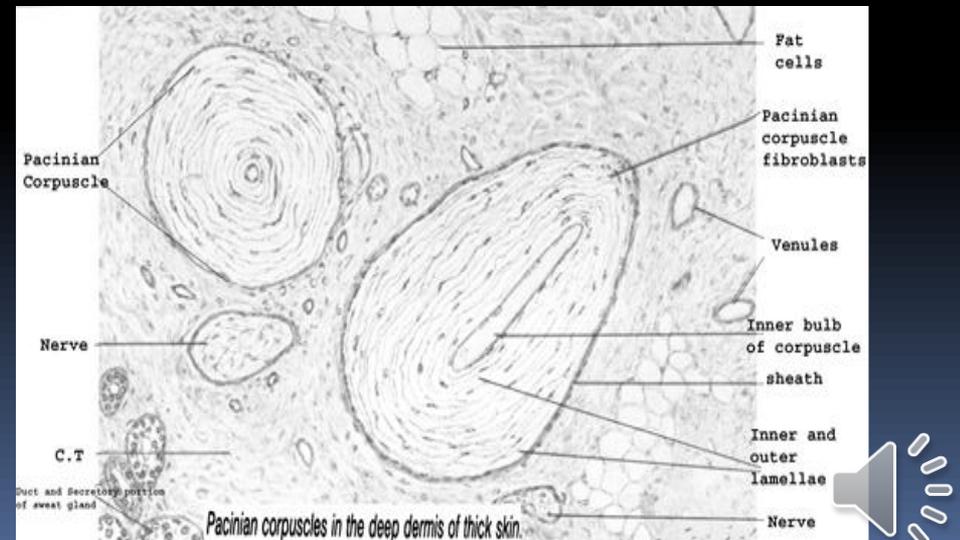
# Encapsulated Receptors

## ***Pacini corpuscle*** ***"lamellar corpuscle"***

- Onion slices like
- It present in epithelium, C.T , serous membrane, Ms, visceral organs and associated with ligament, tendon



- ***Function:***  
*- responsible for pressure*



AUDIO  
JUNGLE

Thank you

