#### Functions :

- Muscle fibres of the cell contract and expand the body. 1)
- Cells of mouth aperture & tentacles act as 'sphincter' to close the opening. 2)
- 3) Flagellated nutritive cells, through their lashing movement convert the food into small particles. They also help to take water through mouth aperture, if necessary.
- Pseudopodial nutritive cells engulf small food particles and perform intra-cellular digestion. 4)

2) Interstitial cell: In between the Nutritive cells, a cluster of round or triangular cells, are known as 'Interstitial cells'. Actually, these cells came from epidermis. Each cell has - prominent nucleus, smooth endoplasmic reticulum, ribosome & some mitochondria.

#### Functions :

1) When necessary, this cell transforms into any type of endodermal cell.

3) Sensory cell: Sensory cells are lying dispersely in between the Nutritive cells. Each cell is narrow & elongated. Distal end towards coelenteron of the cell gives rise to fine 'sensory hair', while 'hair' originates from the proximal end and attaches with nerve fibres at mesogloea.

## Functions :

unctions:
1) Probably, Sensory cell verifies the quality of food that entered with metasingle coelenteron and sends the information to the nerve cell.
Nerve cell: Nerve cell is pastioned adjacent to meeople a alceless in number. Nerve cell consists of a cell body and two or re fine brancher Nerve thread the result to the nerve cell consists of a cell body and two or

4) Nerve cell: Nerve cell is D more fine branch a Nerve fibres (process)'. Nerve fibres of the nerve cells join together, build 'Nerve-network'.

#### **Functions**:

1) Co-ordinate and create appropriate response against stimulus, received by the Sensory cell.

5) Gland cell: Gland cells comparatively smaller, without muscle fibres and are lying scatteredly between the space of Nutritive cells. They are more abundant at mouth aperture (hypostome) and inner body trunk and are less at inner pedal disc. They are absent at tentacles.

Gland cells are 2 types -

**H.W.**: Make a comparative study between the cells of Epidermis and Endodermis.

- i) Mucous secreting gland cell: They are located mainly at hypostome and secrete slippery 'mucus'.
- ii) Enzyme secreting gland cell: These gland cells are lying at all inner trunk and secrete enzymes for digestion.

#### **Functions**:

- 1) Gland cells of mouth aperture (hypostome) secrete mucus, which makes the food slippery and helps to swallow / ingest.
- 2) Gland cells of inner trunk secrete enzyme, which helps to digest the food.



3) Gliding / Amoeboid movement: Gland cells of pedal disc of epidermis secrete sticky juice 'mucus' which helps Hydra to make the surface slippery. Then, gland cells create pseudopod on that surface and move slowly to cover the very short distance. This type of locomotion is known as 'Gliding' or 'Amoeboid movement'.

4) Floating: In aquatic environment, gland cells of pedal disc of epidermis form 'Bubble', so that Hydra can float on water surface. Whenever bubble ruptures, it works like a raft ((seril) and by touching this Hydra floats on water surface in opposite direction.

5) Drowning: Whenever bubble ruptures, Hydra becomes heavy and drowns in water. Actually, it is an unintentional movement

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of Hydra. 6) Swimming: In aquatic environment, Hydra can swim freely by moving its tentacles along the water current / wave.

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**12** onytes with the help of tentacles. 7) Climbing: Sometimes, Hydra detaches its pedal disc and starts climbin 20

8) Crawling: Sometimes, Hyd ibstance or aquatic pants. Later, through contraction & expansion of the body, Hydra moves u ward & downward by placin ine out-ulisc on a suitable place.

9) Tentacular movement / Walking: Before starting this movement, Hydra bends its body down to the substratum i.e. a loop is formed towards the direction of movement. Pedal disc lifted upward, to stand directly based on tentacles. Then, Hydra walks by using the tentacles.

10) Body contraction & expansion: In this movement, Hydra locomotes from one place to another by contraction & expansion of musculo-epithelial cells.

Gas bubble leaves of uatic plants Floating climbing ການ ການ ການ ການ ການ ການ ການ

Gastrodermal or endodermal Gland cells of mouth aperture (hypostome) secrete mucus, which makes the food slippery and helps to swallow / ingest; Gland cells of inner trunk secrete enzyme, which helps to digest the food.

6) Nutritive cell or Musculo-Epithelial cell: Perform extra-cellular digestion or inter-cellular and intra-cellular digestion.

7) Cnidocyte: Used in movement, capturing of prey & self protection.

### B) Function-based division of labour :

1) Mouth aperture: Participates in ingestion of food and expels undigested food residues.

2) Coelenteron / Gastrovascular cavity: Works as both body cavity and alimentary canal; takes part in extra-cellular digestion

or inter-cellular digestion; contains water and thus works as 'Hydroskeleton'.

3) Tentacle: Used in capturing of prey, self protection & movement.

4) Trunk: Holds bud and reproductive organ *i.e.* testis & ovary.

5) Pedal disc: Helps Hydra to attach on the substratum; forms 'Bubble' so that Hydra can float on water surface; makes pseudopod and move slowly to cover the very short distance (Gliding or Amoeboid movement)

iii) Symbiosis in Hydra, eN from Notesale, Greek 'sym means 'together' & 'bios and a feature of the benefitted feature Greek 'symmetries' together' & 'bios meas ung'. When two different species stay together mutually and become benefitted from each other (i.e. show interdependency), then this type of association is called 'Symbiosis'. The two species of individuals participate in symbiosis, are called 'Symbiont'. Green Hydra [Hydra viridissima (Chlorohydra viridissima / H. viridis)] and Zoochlorella named unicellular alga show this type of symbiotic association. Here, the alga is called 'Lifelong paying guest' of Hydra. They are benefitted from each other through the following ways -

# Ways Zoochlorella gets benefit -

1) Shelter: Zoochlorella gets shelter in the musculo-epithelial cells of gastrodermis of Hydra.

2) Photosynthesis: CO<sub>2</sub> gas produced during respiration of *Hydra*, is used as raw material for photosynthesis.

3) Food production: Nitrogenous waste products derived from the metabolic activities of *Hydra*, are used for protein synthesis.

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