Receptor, Effector & Adjustor Mechanism

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Fiber:	तंतु
Element:	तत्त्व
viscera	आँत

Stimulus	उत्तेजन	Gland	ग्रन्थि		
Somatic	दैहिक	impulse	आवेग		

Three types of Cells:
1. Receptor cells
2. Effector cells
3. Adjustor cells

A. Receptor Cells: ज्ञानेन्द्रियाँ (sense organs)
Specialized nerve cells:-
respond to:
- environmental changes &
- changes happening within body.

Responds to a peculiar stimulus/sensation.

Classification of stimulus:

1. Thermal	Hot & cold
2. Mechanical	Hearing, balance, touch
3. Chemical	Taste, smell, sensitivity for chemicals
4. Light	eyes

General classification of Receptors:

Class	Senses	Basis of Classification
1. Exteroceptor बाह्याग्राहक	Cutaneous pain, (त्वचीय) " " " " pressure, " " " " warmth, Vision	Respond to - Superficial Stimuli - Bodily movements
2. Interoceptor अन्तर्ग्राहिक	Organic pain, " " " " pressure, " " " " warmth/cold, Olfaction (घ्राण), Gustation (स्वाद)	Respond to: - Inside body stimuli Specially: - Digestion - genitourinary system (मूत्र तंत्र)
3. Proprioceptor (Kinaesthesia**)** मध्यग्राहक	Muscle Kinesthesis Tendon kinesthesis Joint kinesthesis	Respond to: - Bodily movement Lies in: - Muscles/tendons & - Non auditory inner ear
4. Nociceptor (pain receptor)	Cutaneous pain, Organic pain, Kinesthetic pain	Spread throughout body, - Respond to injurious (घातक) stimuli

Note: the specialization of receptors is **Relative** & not Absolute**.**
Eg. Light receptors of eyes also respond to thermal & chemical stimuli

C. Adjustor Cells:-
- Resulting in reaching impulse from Receptor cells & Effector cells
- Found in central nervous system
- Connect Receptor cells & Effector cells.

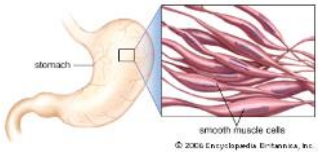
B. Effector Cells: प्रभावक कोशिकाएं
Help a person to Respond to stimulus.

2 types of Effector Cells:
a. Muscles
b. Glands
1. Muscles
   a. Smoothed muscles
   b. Striped muscles
   c. Cardiac muscles
2. Glands
   a. Exocrine glands बहिःस्रावी
   b. Endocrine glands अन्तर्स्रावी

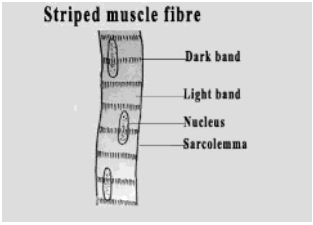
1. Muscles:-
A muscles does contraction. Be any type.
Any stimulus from Adjustor cells / Central Nervous System triggers Somatic (दैहिक) & Chemical activities, which causes contraction & release of stored energy in muscles fiber.

Made up of muscle fiber

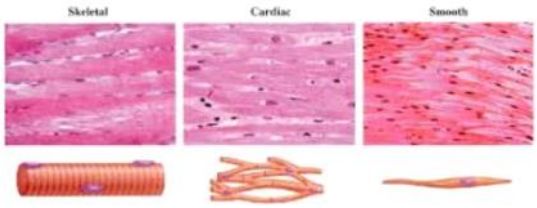
a. Smoothed muscles:
- Found in visceral organs(आँत, पेट, blood vessels)
- Fibrillae (a substance) is found in smoothed muscles
  Fibrillae helps in contraction



b. Striped muscles: (skeletal muscles)
- Found in limbs, hands, feet
- Longer than smoothed muscles
- Enclosed in flexible membrane (**Sarcolemma**)
- Flexible fibers arranged in alternate fashion
  less darker after the darker (sarcolemma)
  thus appears striped.



c. Cardiac muscles:
- found in heart
- Type of striped muscles
- Yet fibers are not parallel or enclosed in Sarcolemma (unlike striped muscles)



2. **Glands** (**ग्रन्थि**):-
- Type of Effector cells to maintain balance in internal environment of body
- Secretion of chemical substance

- 2 types:
    1. Exocrine glands
    2. Endocrine glands

    1. **Exocrine glands:** (duct glands)
    - Secretion not directly dissolves in blood, but discharged out side
    - Salivary gland, Sweat gland, Tear gland

    2. **Endocrine gland**:(ductless gland)
    - Secretion is called **Hormones**
    - Secretion dissolves in blood
    - Help in physical & mental development.
    - Mostly composed of **epithelium.**
        - (Epithelium: line of tissues covering the outer surfaces of organs and blood vessels)

Neuron

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तंत्रिका आवेग	nerve impulses
तंत्रिका कोष	Nerve cells
उत्तेजक	Stimulus
संवेदी ज्ञानवहि	Sensory
साहचर्य	Association

Neuron (nerve cell):
smallest unit of Nervous System.

Neuron hypothesis:
There are many independent neurons
In Nervous System. Though Neurons
Interact with each other yet remain
Unrelated to each other.

Neuron: Types, Structure & Function:

- Smallest unit of nervous system;
  helps to convert stimulus into electrical impulse.
- Neuron (biological transducer).
- Around 12.5 billion neuron found in human body & out of which 10 billion found in brain only.

- **Glia (Neuroglia) cells (housekeeping cells):**
- These are other types of cells in nervous system that **don't produce electrical impulse**, but their role is to **support Nervous system**.
- Glia are also known as housekeeping cells.

A neuron is as complicated as a personal computer, having on
An average 15000 physical connections with other cells.

Neuron: distinction on the basis of <u>function</u>:

1. Sensory (Afferent) Neuron (संवेदी / ज्ञानवहि)
2. Motor (efferent) Neuron (
3. Association Neuron (साहचर्य)

4. **Sensory (**ज्ञानवहि / संवेदी) **Neuron**