

SENSORY RECEPTORS.

Types of Sensory Receptors.

1. Mechanoreceptors : mechanical compression/stretching of receptor.
[touch pressure]

2. Thermoreceptors : cold & warm

3. Nociceptors : detects physio/chemical damage to tissues (pain)

~~4. Ther~~

4 EM RECEPTORS : Detects light on retina of eye.
[Light]

5 Chemoreceptor : Taste, smell, ^{oxygen} ~~concentration~~ in arterial blood, ~~osmolarity~~ in body fluids
CO₂ conc.

* Epidermis & dermis includes

↳ mechanoreceptor (touch, pressure), thermoreceptor (cold, warmth), nociceptors (pain).

* Receptors with exposed tip nerve endings

Merkel's disc



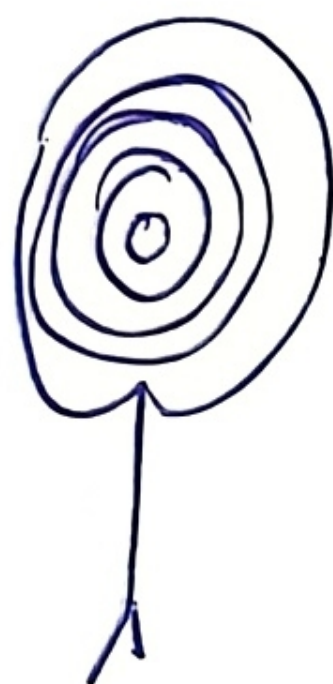
← touch pressure
- position

Ruffini end organ [BULBOUS CORPUSCLE]



- stretching of skin
- control of finger position & movement (Grip of object)
- slight pressure receptors

* Receptor with encapsulated N endings
Pacinian corpuscle.



- vibratⁿ & pressure (mechanoreceptor)

Merkel's / tactile corpuscle.



- Touch

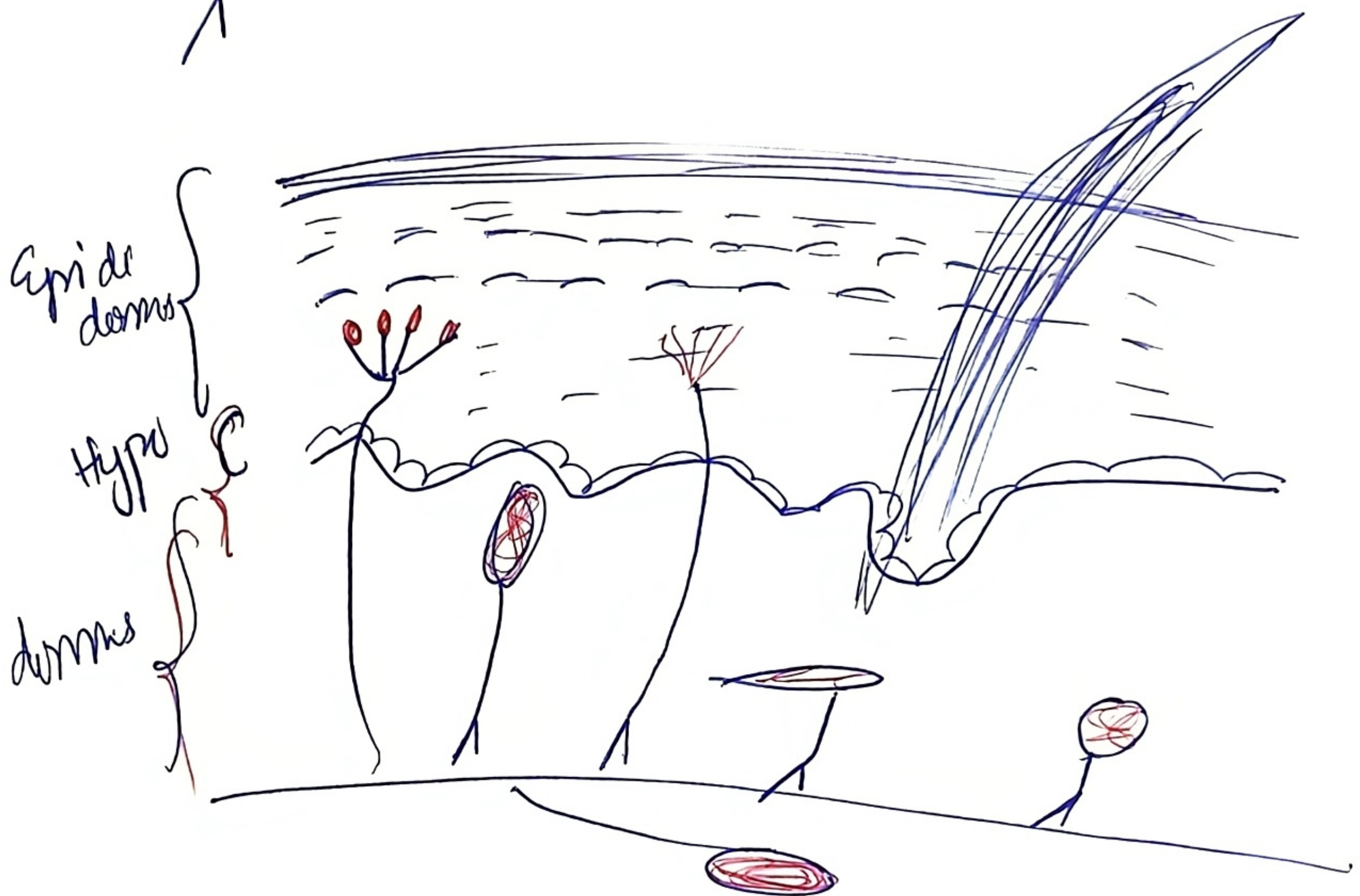
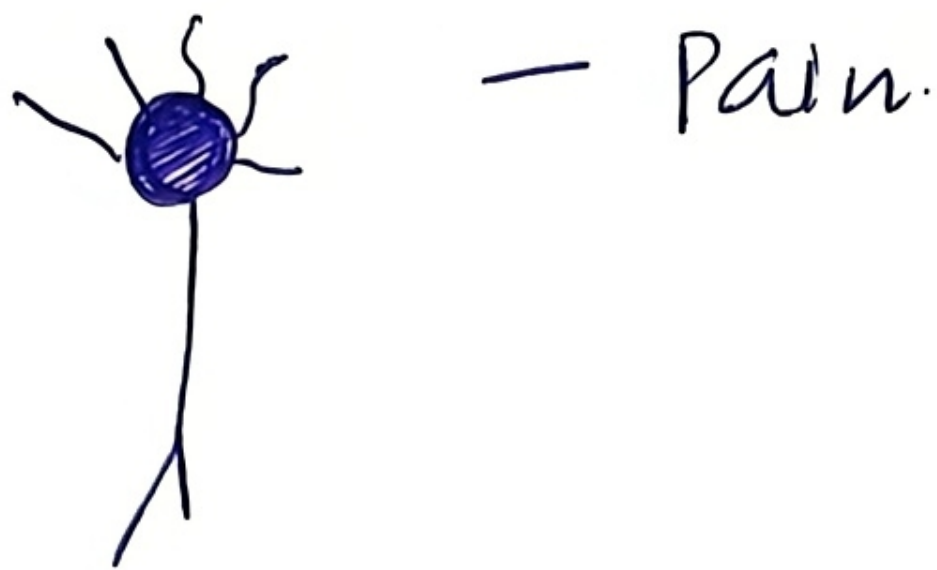
Krause's corpuscle



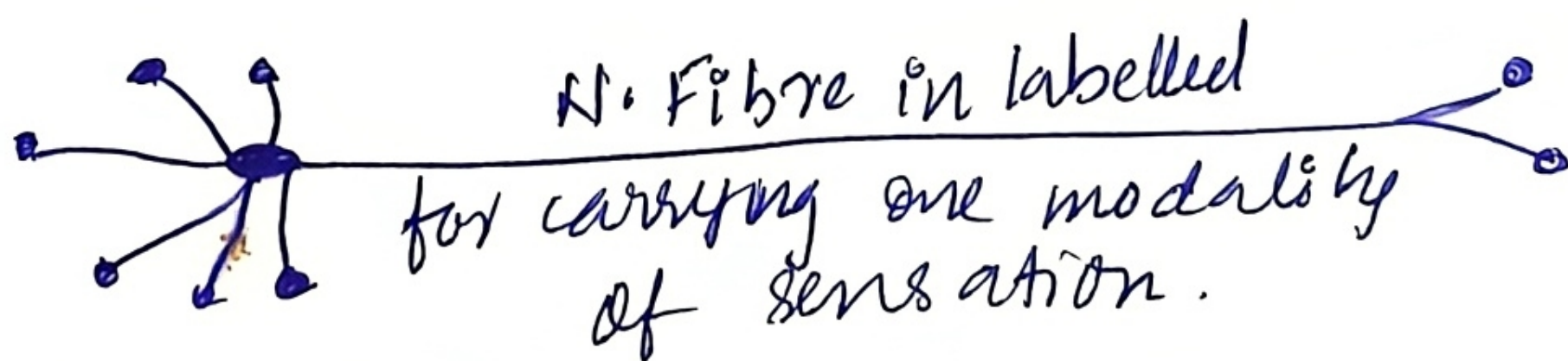
- cold

~~Free~~

Free nerve endings

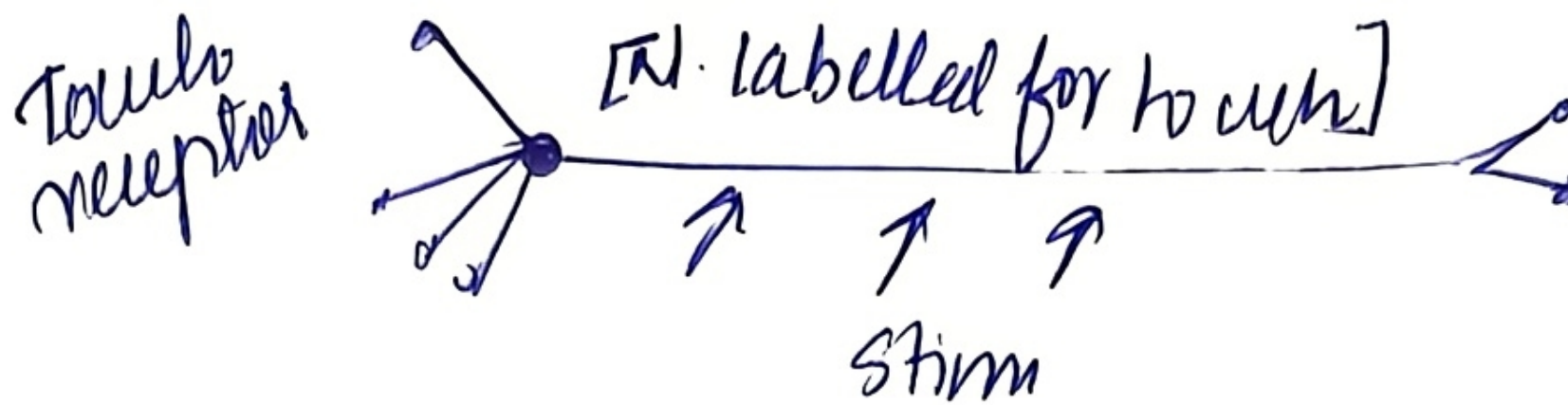


LABELLED LINE PRINCIPLE & LAW of PROJECTION



} specificity of N. fibre to carry one
modality of sensation is known as labelled line
principle

the impression of specific stimulus arising w/ specific N. fibre is stimulated anywhere along, to brain is called law of projection



TRANSDUCTION

stimulus on receptor.



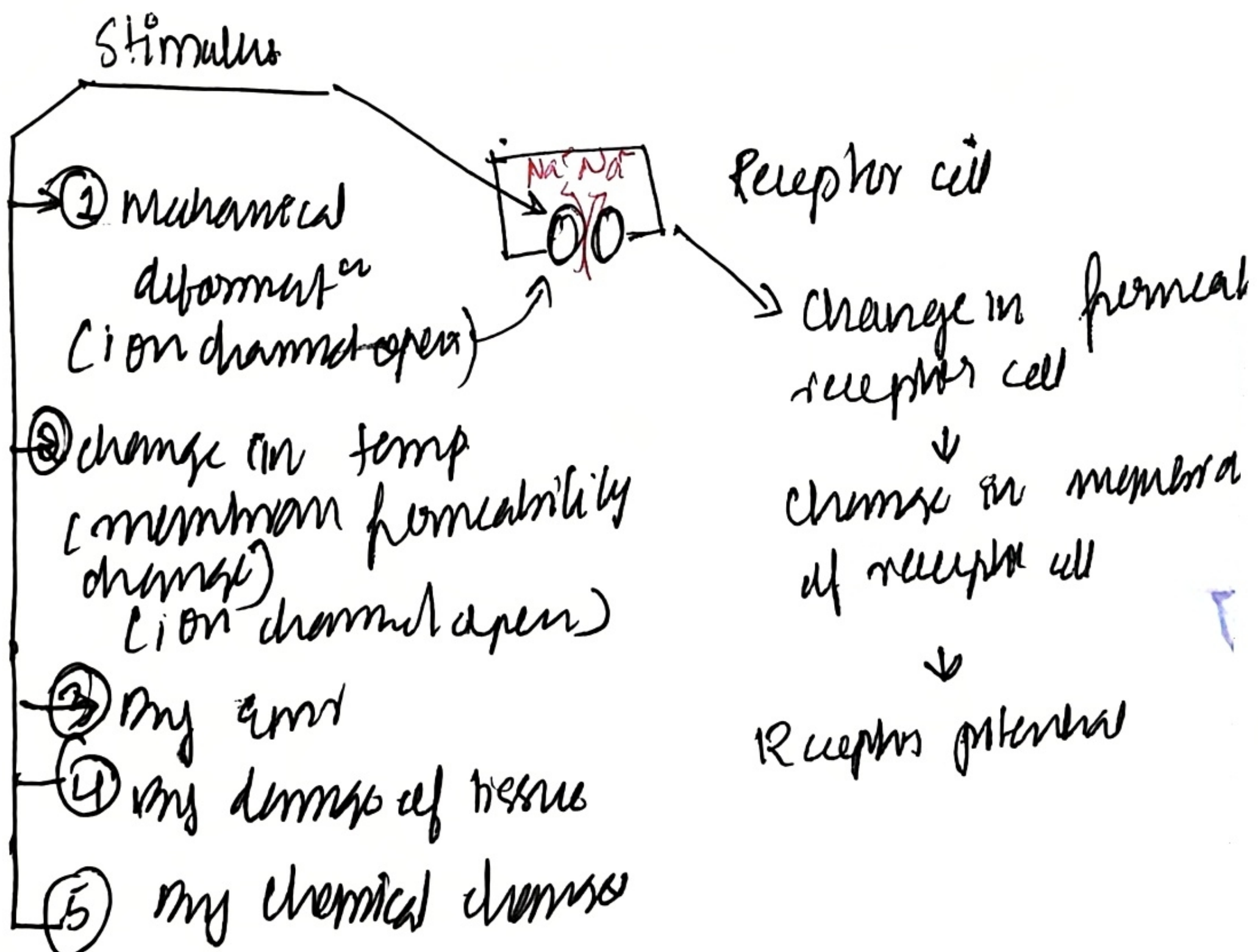
change in mem. potential

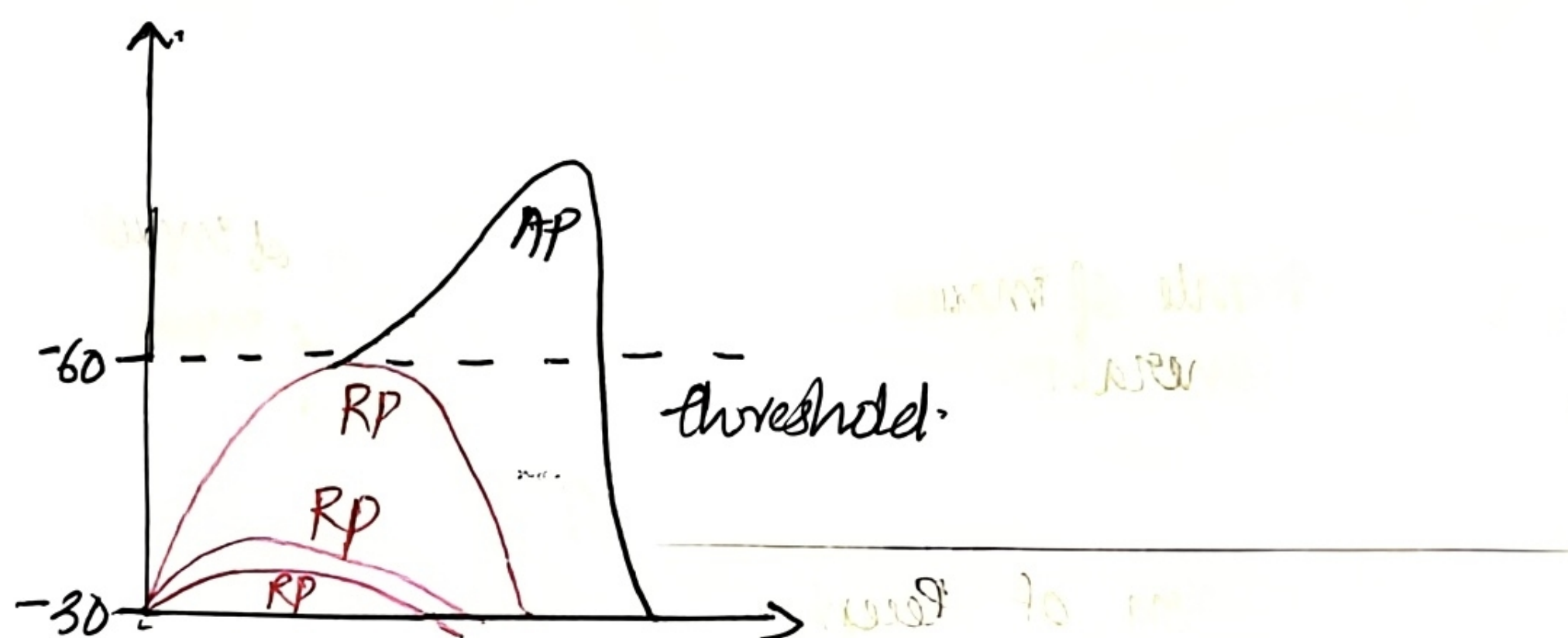
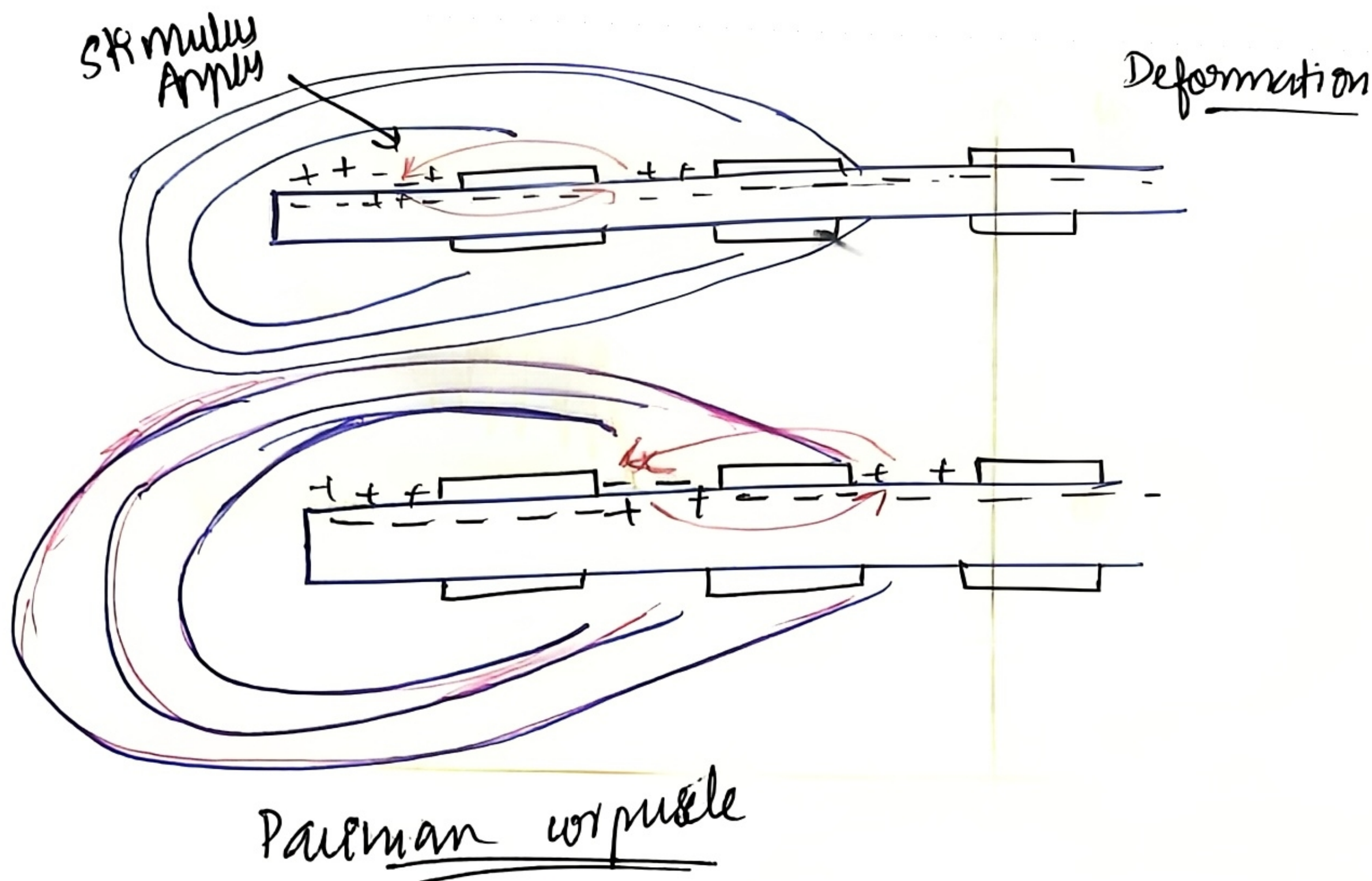


Action potential

(Electrical impulse generated)

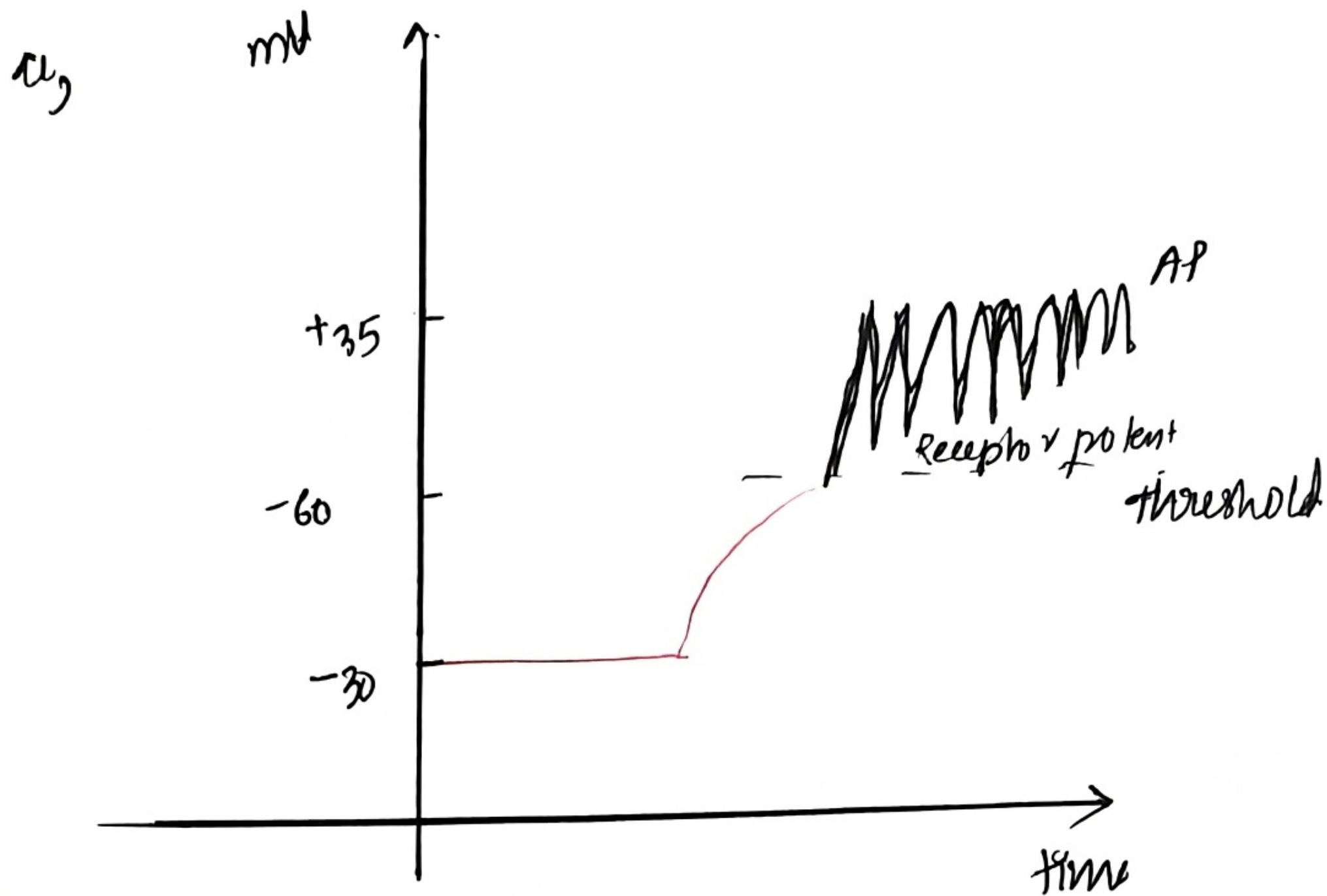
transduction





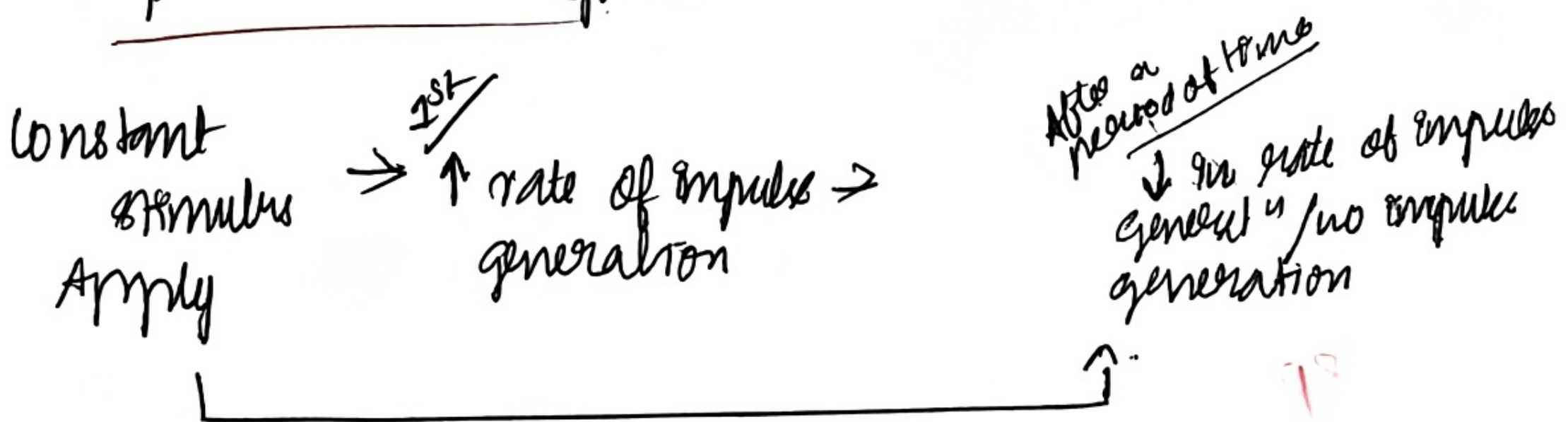
Stimulus intensity $\propto$ AP frequency
 independent of amplitude of AP.

Our N.S - Frequency modulated not amplitude modulated N.S.

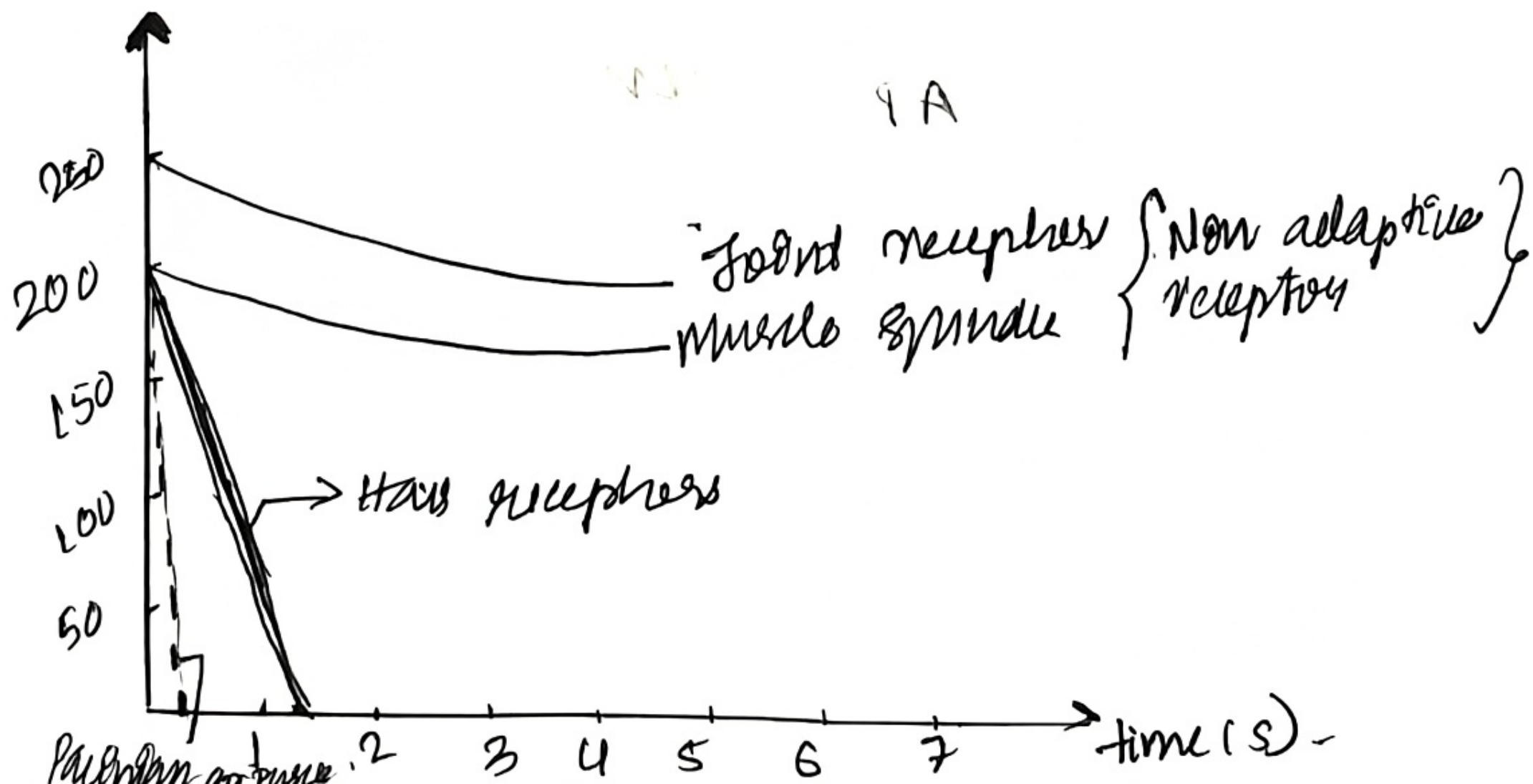


X Absolute refractory P.D ultimately limits the max frequency

Adaptation Of Receptors.



Adaptation of Receptors.



Adaptatⁿ time.

painless < hair < muscle < joint receptors

Classification of N. Fibre.

1. Erlanger Gasser classification [Alphabetical class]

- sensory, motor, Autonomic ~~reception~~

2. Lloyd classification [Numerical classification]

- sensory receptor

CLASS	RECEPTION	Numerical CLASS	SENSORY FIBRE	MOTOR F.	AUTONOMIC F.
A α 20/20 diameter velocity	Motor, sensory Proprioception stretch impulse carried by	Ia	Muscle spindle [primary ending]	skel muscle	x
A β	sensory	Ib	Muscle tendon [Golgi tendon organ]		
A γ	Motor	II	Muscle spindle [2 ^o ending] Painless cor. Meissner corp. hair receptor	x	x
A δ	sensory	III	Pricking pain Deep press, touch	Motor to spindle muscle spindle	x
B	Autonomic	x	x	x	preganglion auto. fibre

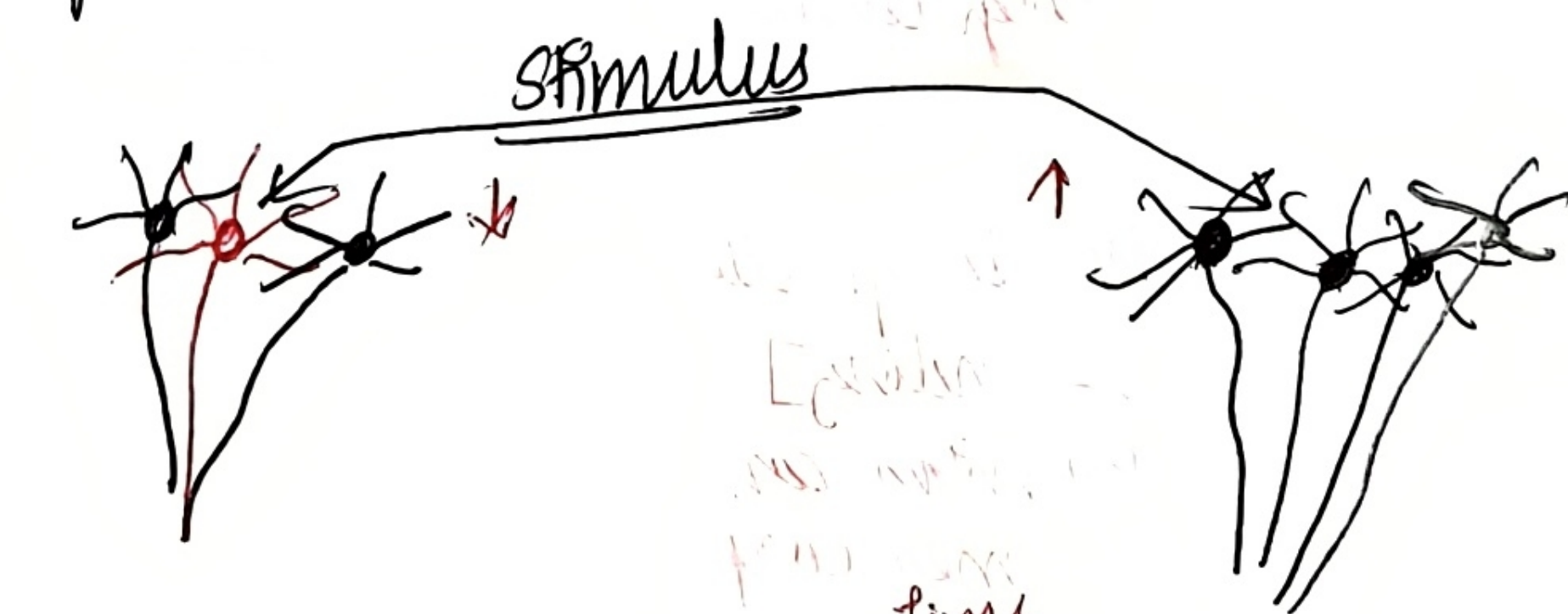
C Unmyelinated 0.5 / 0.5	Sensory Autonomic	IV	Crude touch pressure Aching pain Cold & warmth.	*	Postganglionic Autonomic Sympathetic fine
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Temporal Summation

Stimulus strength $\uparrow$ $\xrightarrow{\text{Freq. of nerve impulses}}$ Impulse generation $\uparrow$

$\downarrow$
Temporal summation (related to time)

Spatial Summation



At same time
Stimulus strength $\uparrow$ $\xrightarrow{\text{increased no. of fibres}}$ Impulse generation

$\downarrow$
Spatial summation

Properties of Sensory Receptors.

- * Differential sensitivity
- * Follows labelled line principle
- * Follows law of projections
- * Are adaptable
- * Show graded responses
- * Capable of transduction

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