SENSORY SYSTEMS

RECEPTORS:GENERAL, MODIFIED DENDRITIC ENDINGS (touch, pain, proprioception, pressure, temperature)

SPECIALIZED, COMPLETE CELLS (taste, smell, vision, hearing, equilibrum)

SIGNAL **INTERIOR ENVIRONMENT**
EXTERIOR ENVIRONMENT
BODY MOVEMENT/POSITION (unconscious, self awareness)

STIMULI: MECHANO-, THERMO-, CHEMO-, PHOTO-, NOCI-, RECEPTORS (adversive stimuli)

GENERAL RECEPTORS:

FREE ENDINGS (denritic) on.....
MERKEL'S DISCS .... PRESSURE
in EPITHELIUM, CONNECTIVE TISSUE ... TEMP....PAIN
HAIR ROOT PLEXUS.... LIGHT TOUCH

ENCAPSULATED (wrapped with connective tissue) MECHANORECEPTOR
MEISSNERS CORPUSCLES ...SKIN.....LIGHT TOUCH

KRAUSE'S END BULBS...MUCOUS MEMB (eye, mouth) .....LIGHT TOUCH
PACINIAN CORPUSCLES.....DEEP CONNECTIVE TISSUE
RESPONDS TO PRESSURE ON/OFF SET (rapid adapting)
good vibration receptor

RUFFINI'S CORPUSCLE....DERMIS ....CONTINUOUS TOUCH (light adaptation)

PROPRIOCEPTORS:

MUSCLE SPINDLES, specialized striated muscle fibers in a connective tissue case, having dendritic endings and efferent motor synapses. The latter to set spindle sensitivity. STRETCH RECEPTOR

GOLGI TENDON ORGANS, encapsulated tendon (collagen) fibers. STRETCH RECEPTOR

JOINT KINESTHETIC RECEPTORS (Pacinian & Ruffini corpuscles, free endings, "Golgi" tendon organs)

STIMULUS===>TRANSDUCTION PROCESS (ion channel gating & graded pot)

===> ACTION POTENTIALS (language of the brain)

===> SENSATION & PERCEPTION

DOCTRINE OF SPECIFIC NERVE ENERGIES: given receptor==> single sensation

DIRECT TRANSDUCTION via dendritic stimulation
via specialized receptor cell & transmitter release

GRADED POTENTIAL = f(STIMULUS STRENGTH, TEMPORAL & SPATIAL SUM)

RECEPTOR POTENTIAL GENERATOR POTENTIAL

ADAPTATION

ASCENDING PATHWAYS.....SPECIFIC VS NONSPECIFIC

CODING OF INFORMATION
- **INTENSITY**
- **LOCATION**
- **TEMPORAL CHARACTER ETC....**

LATERAL INHIBITION

EFFERENT CONTROL OF ASCENDING PATHWAYS

SPECIAL SENSES

TASTE & SMELL=====CHEMICAL SENSES CHEMORECEPTORS

TASTE.....**TASTE BUDS (10,000) in the mucosa of the mouth & pharynx.**
most on surface of the tongue.
located in the EPITHELIAL PAPILLAE of the tongue
SUPPORTING, GUSTATORY, BASAL CELLS = TASTE BUD

TRANSDUCTION === BINDING OF DISSOLVED MOLECULES==ION CHANNEL GATING

GUSTATORY CELLS REGENERATED VIA BASAL CELLS

SENSATIONS: SWEET SOURBITTER SALTY

GUSTATORY PATHWAY: FACIAL NERVE (VII), GLOSSOPHARYNGEAL (IX) VAGUS (X)
SENSORY AXONS ===> SOLITARY NUCLEUS (medulla) ==> THALAMUS ======> CEREBRAL CORTEX (parietal lobe)

SMELL (OLAFACTION)

RECEPTORS: ROOF OF THE NASAL CAVITY AND NASAL SEPTUM
SENSORY CELLS, (specialized neurons that regenerate)
SUPPORTING CELLS, BASAL CELLS

OLAFACTORY PATHWAY: axons of the FIRST ORDER NEURONS collect in bundles at the level of the cribiform plate and pass to the olafactory bulbs synapsing with 2nd order neurons called MITRAL CELLS in complex synaptic clusters called GLOMERULI.

CONSIDERABLE ADAPTATION via inhibitory input @ bulbs

OLAFACTORY BULB =====> CORTEX & LIMBIC SYSTEM

ANOSMIA (zinc deficiency) UNCINATE FITS