

CHAPTER 5

OUTLINE

■ SENSATION & PERCEPTION

- Psychophysics
- Hearing: Our Auditory system
- Gustation: Our Sense of Taste
- Olfaction: Our Sense of Smell
- Somatic senses: Touch & Pain
- Sight: Our Visual system
- Perception

~ Professor Fazakas-DeHoog
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PSYCHOPHYSICS: CONCEPTS

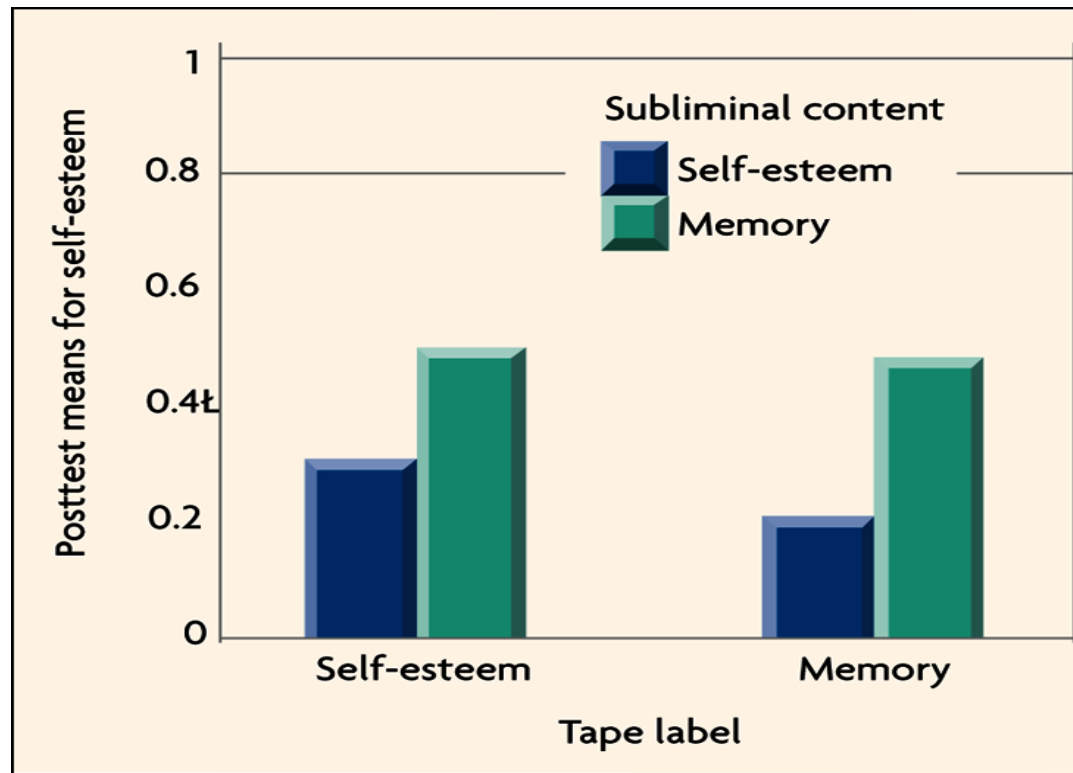
SIGNAL DETECTION THEORY

		Actual stimulus condition	
		Present	Absent
Subject's response	"Present"	Hit	False alarm
	"Absent"	Miss	Correct rejection

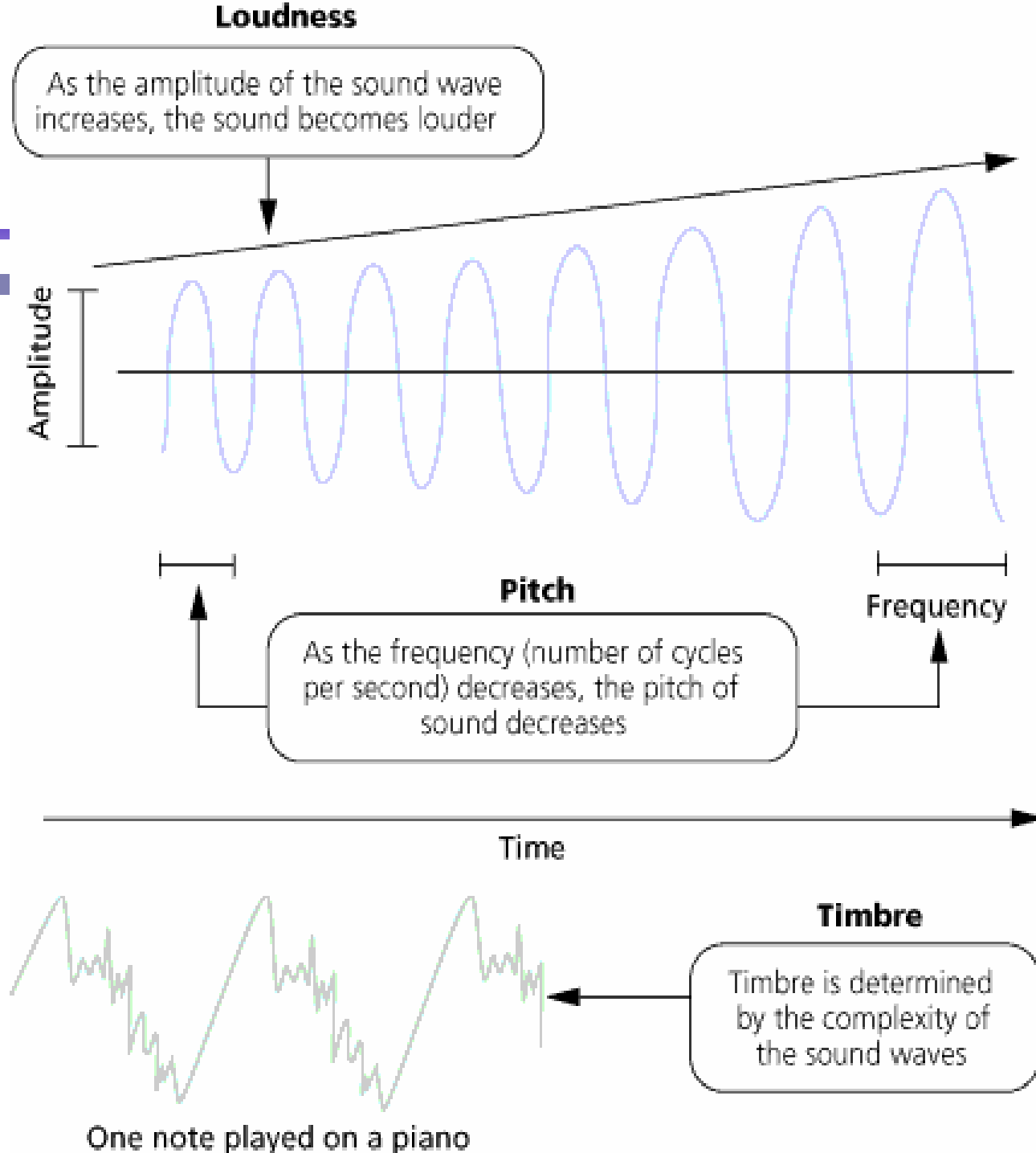
PSYCHOPHYSICS: CONCEPTS

SENSORY ADAPTATION (habituation) - the diminishing sensitivity to a constant stimulus over time.

**SUBLIMAL STIMULI:
CAN THEY
AFFECT
BEHAVIOR ?**



AUDITION

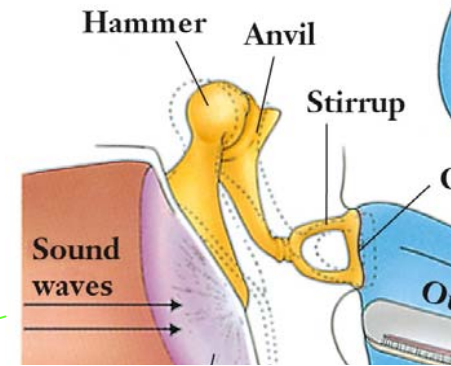


AUDITORY SYSTEM:

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FROM PRESSURE WAVES TO NERVE IMPULSES



Outer Ear

**Malleus
(Hammer)**

**Incus
(Anvil)**

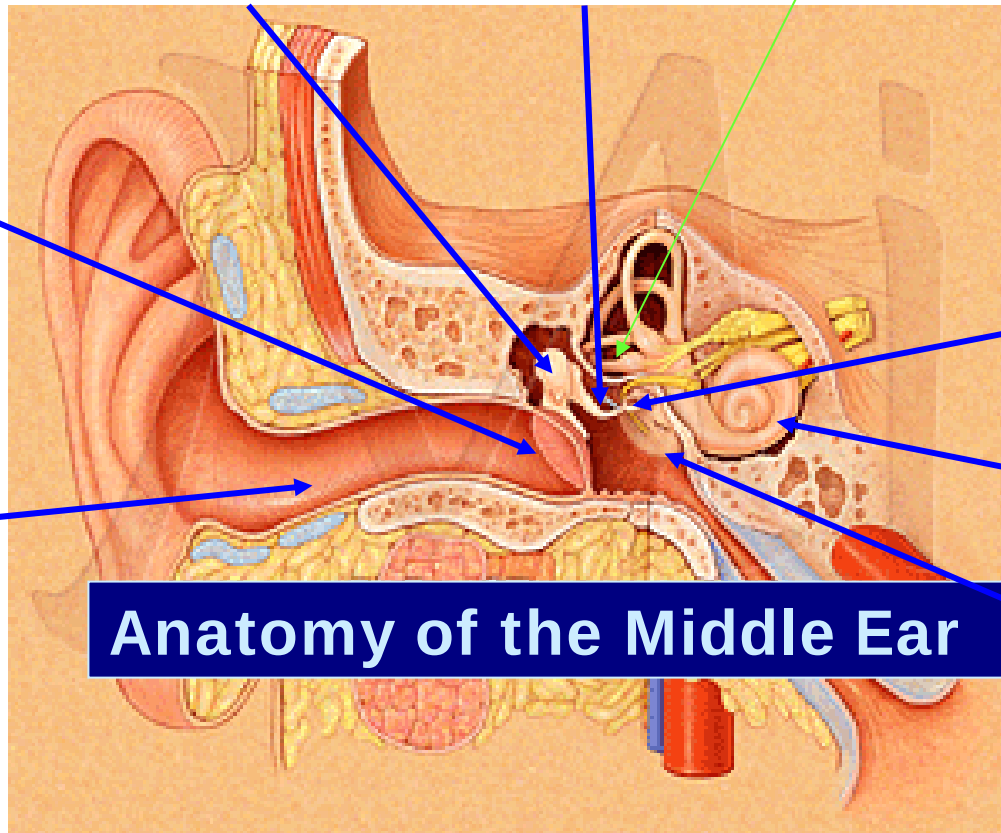
**Tympanic
Membrane
(Eardrum)**

**External
Auditory
Canal**

**Stapes
(Stirrup)**

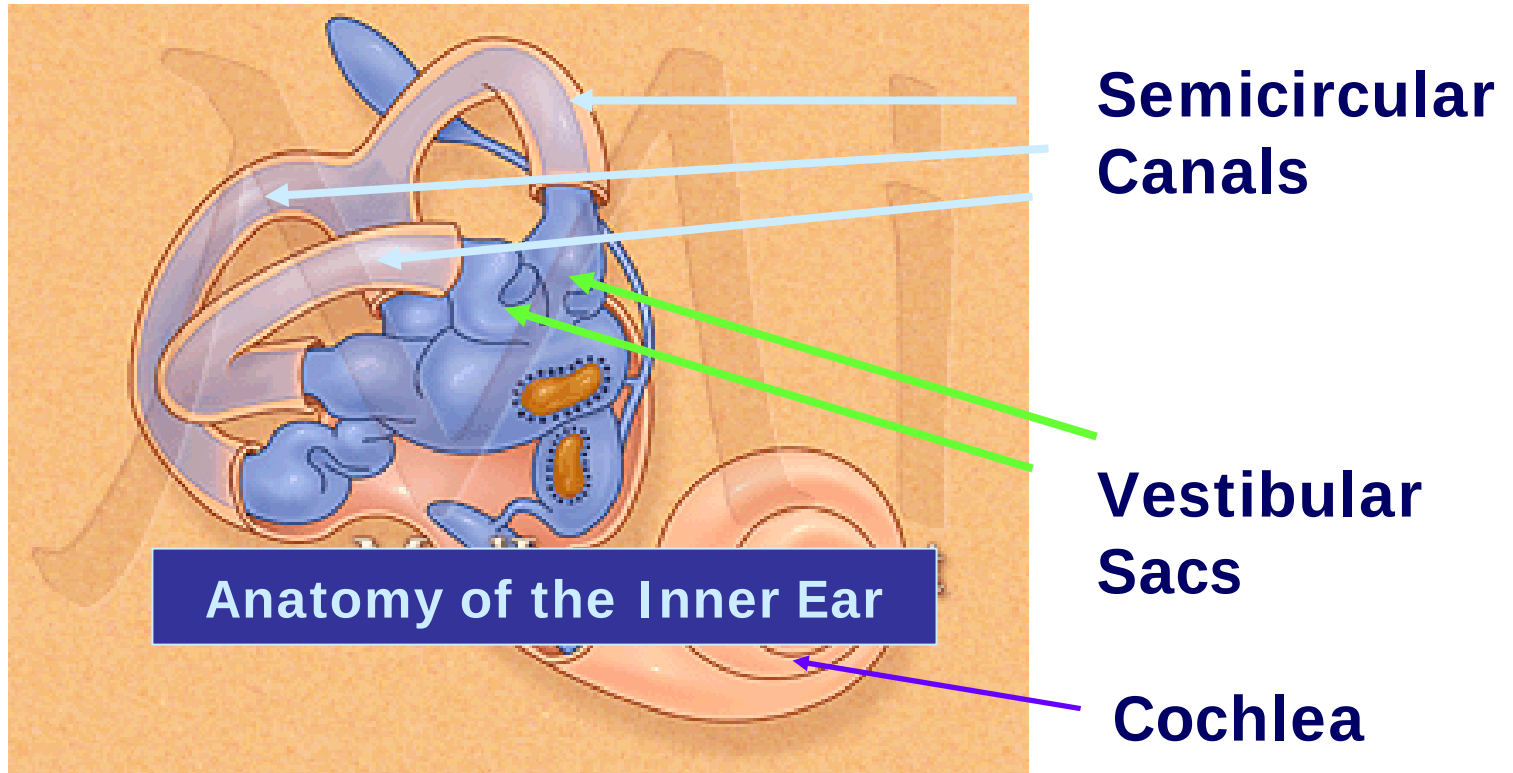
Anatomy of the Middle Ear

**Oval
window**



VESTIBULAR SYSTEM

BODILY ORIENTATION OR EQUILIBRIUM

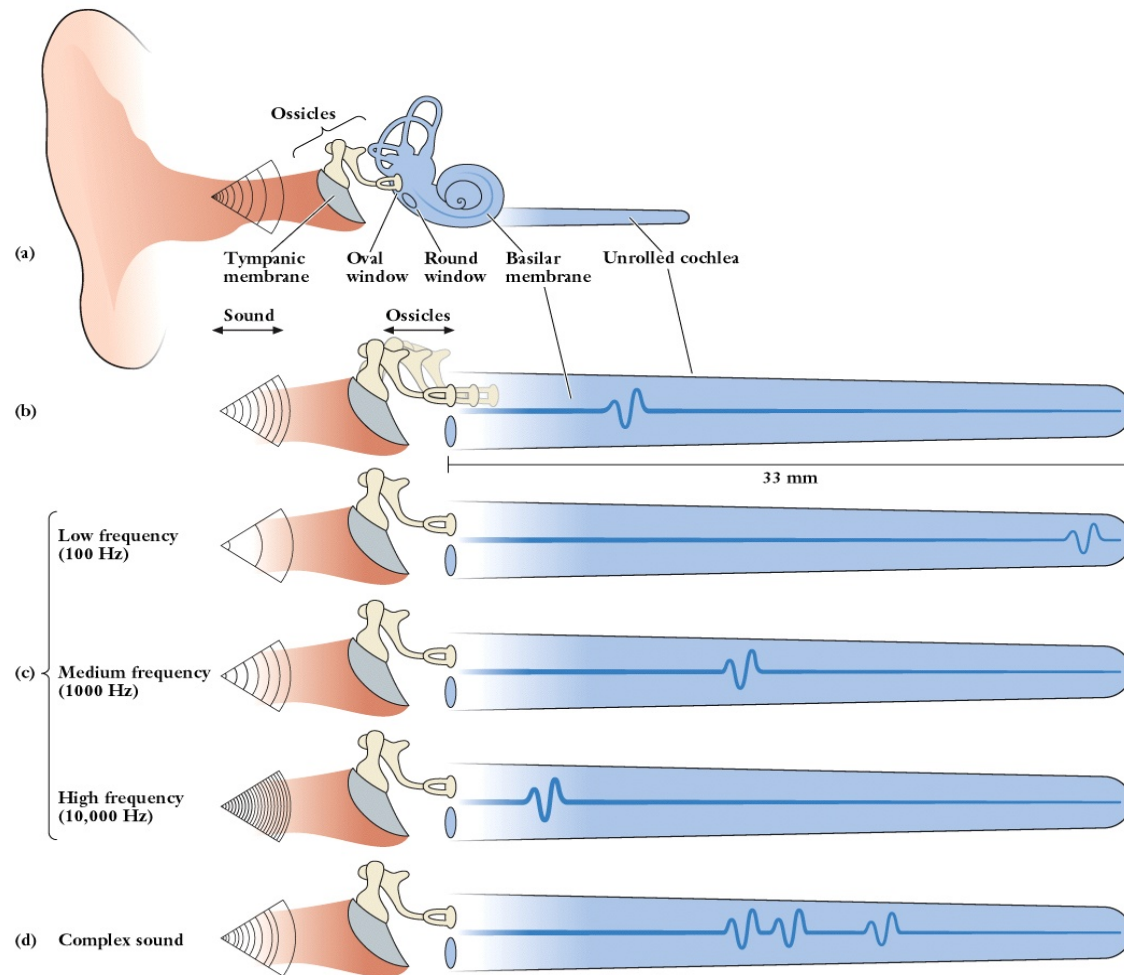


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AUDITORY SYSTEM

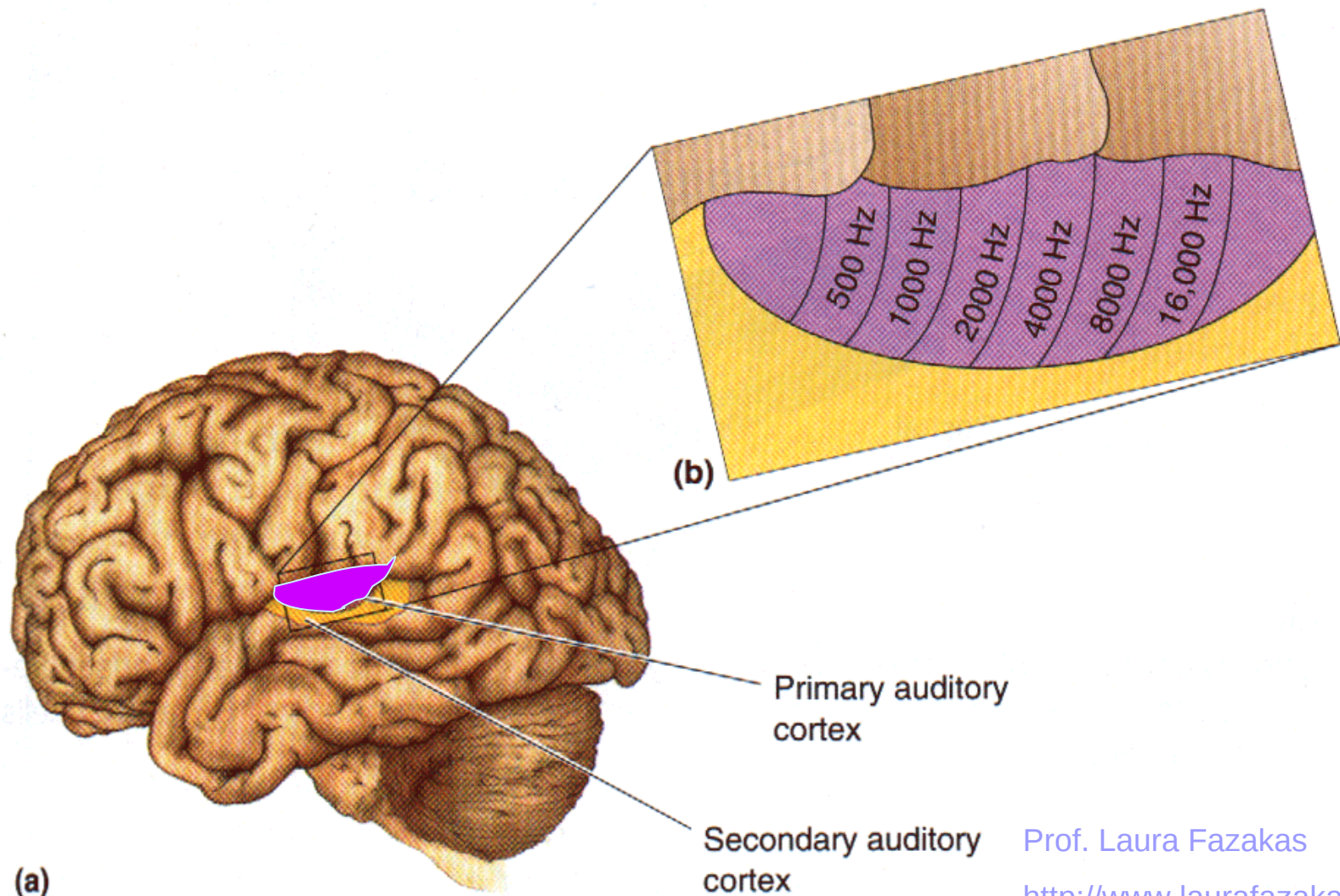
PERCEPTION OF PITCH



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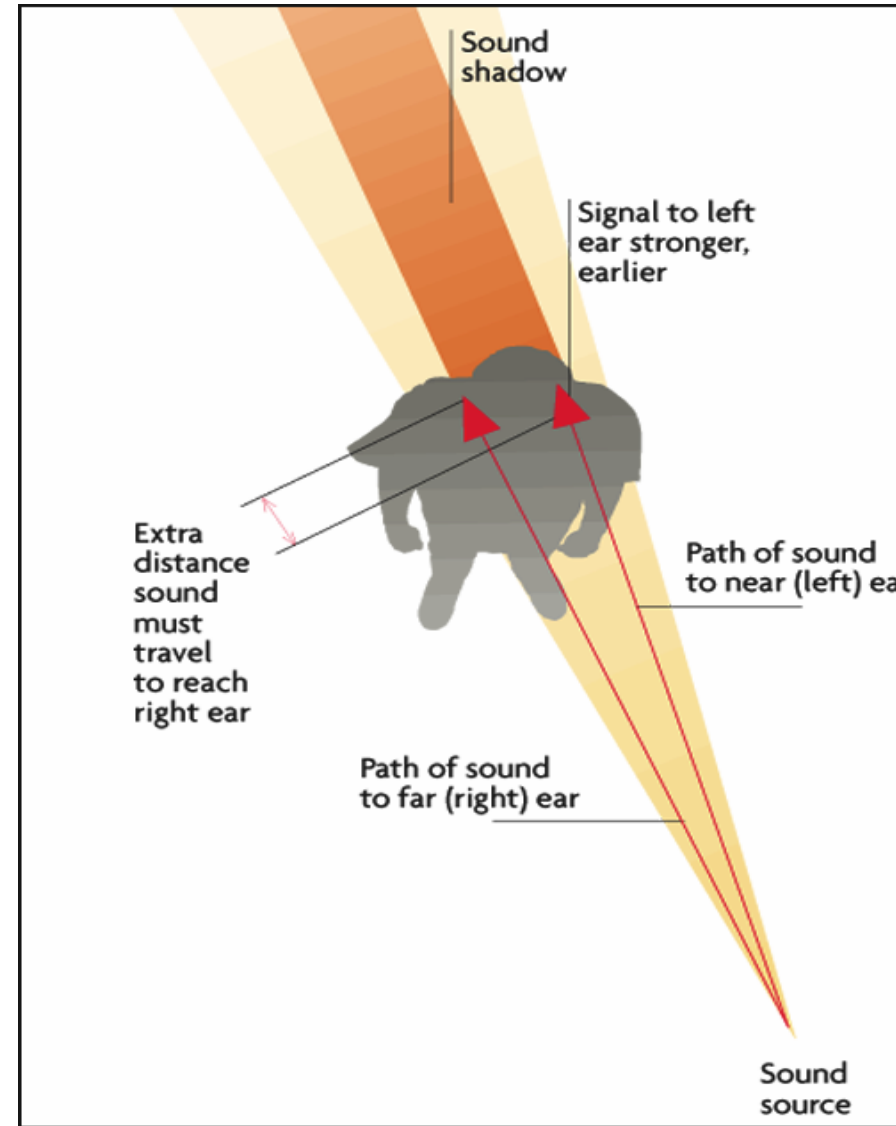
<http://www.laurafazakas.com>

TONOTOPIC ORGANIZATION OF THE AUDITORY CORTEX



PERCEPTION OF SOUND

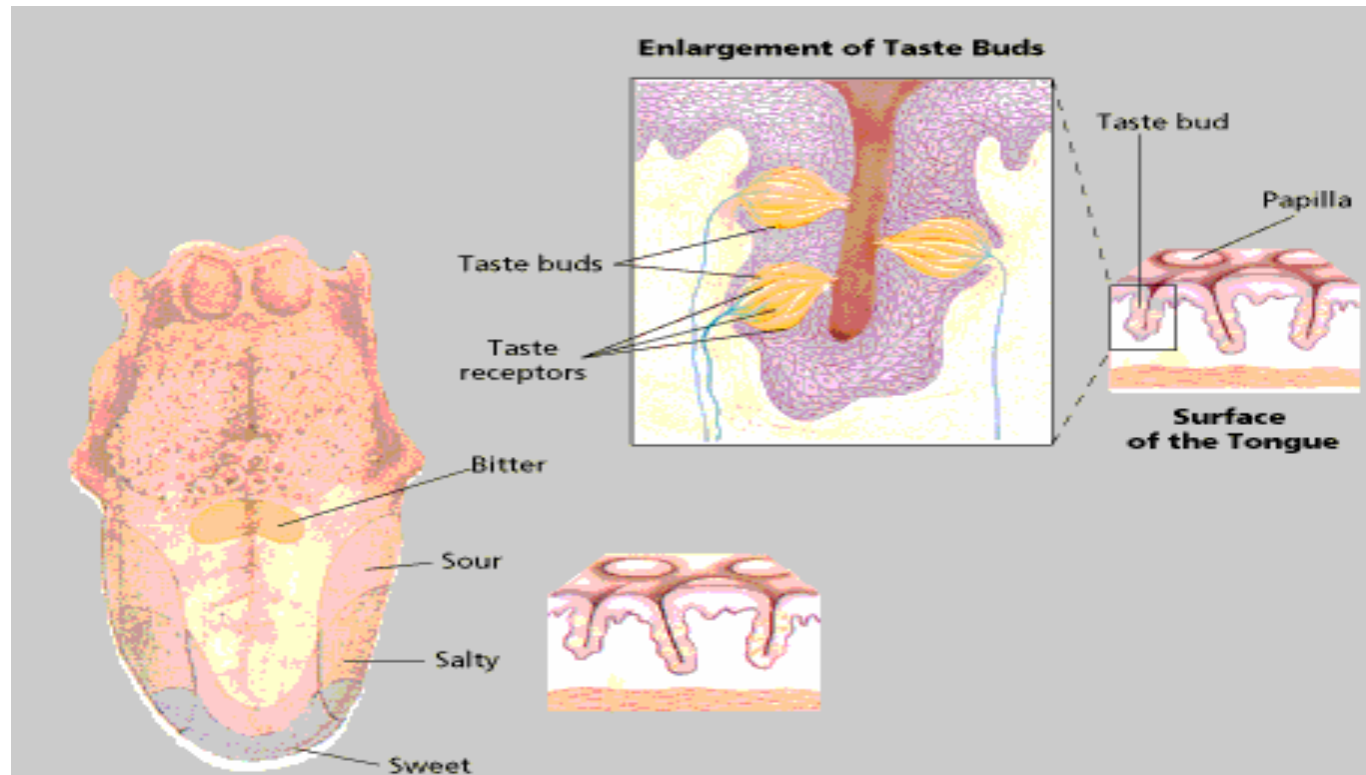
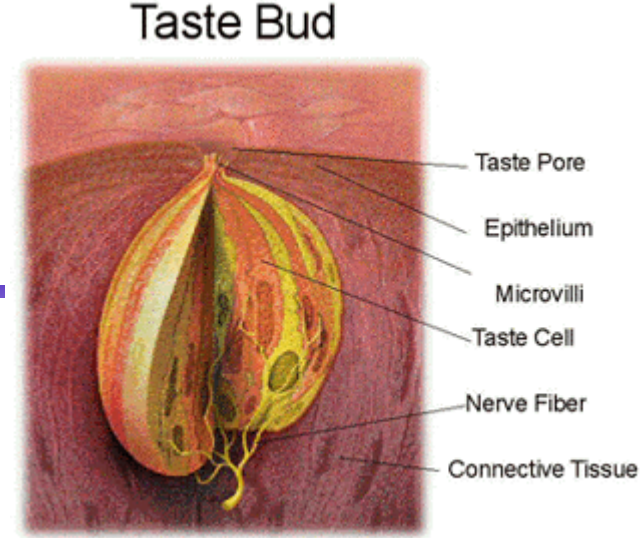
LOCATING SOUNDS IN 3-D SPACE



OUR SENSE OF TASTE

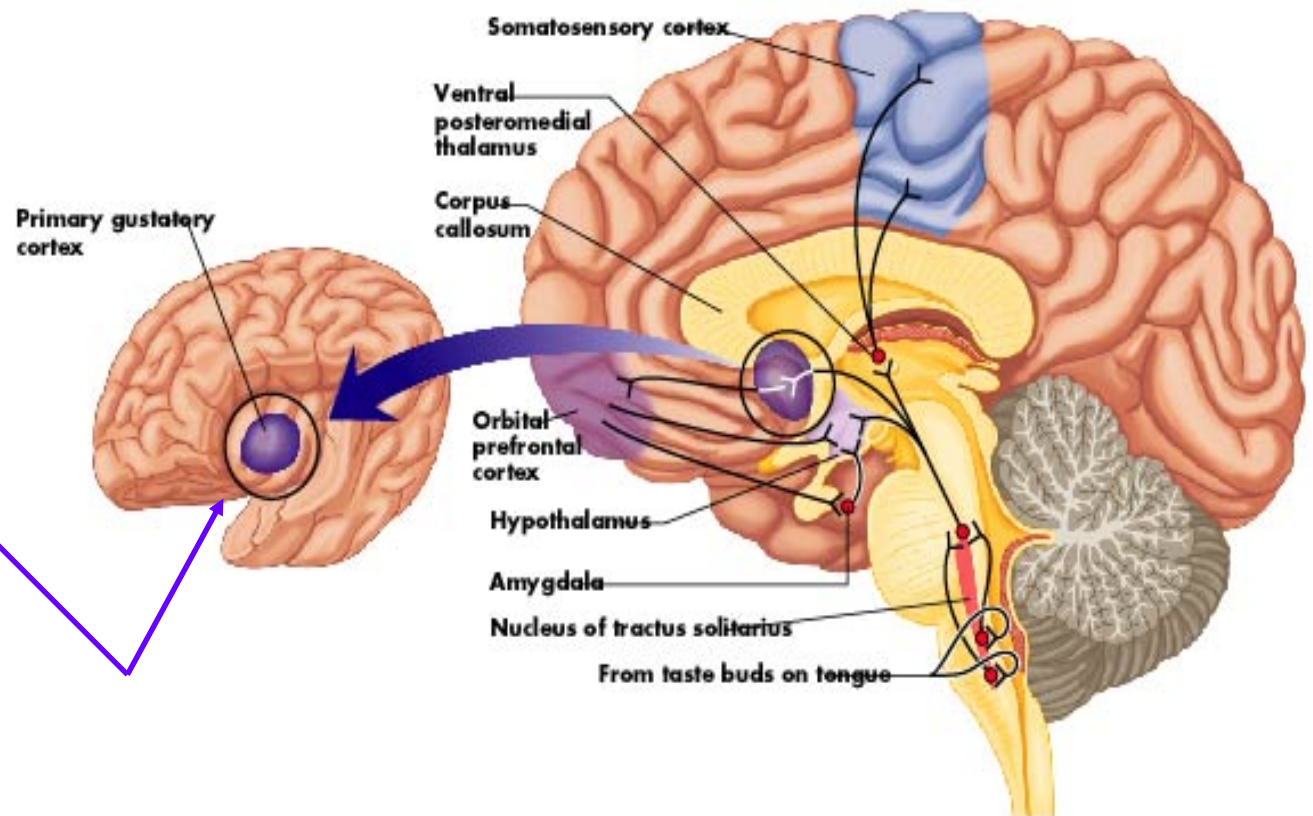
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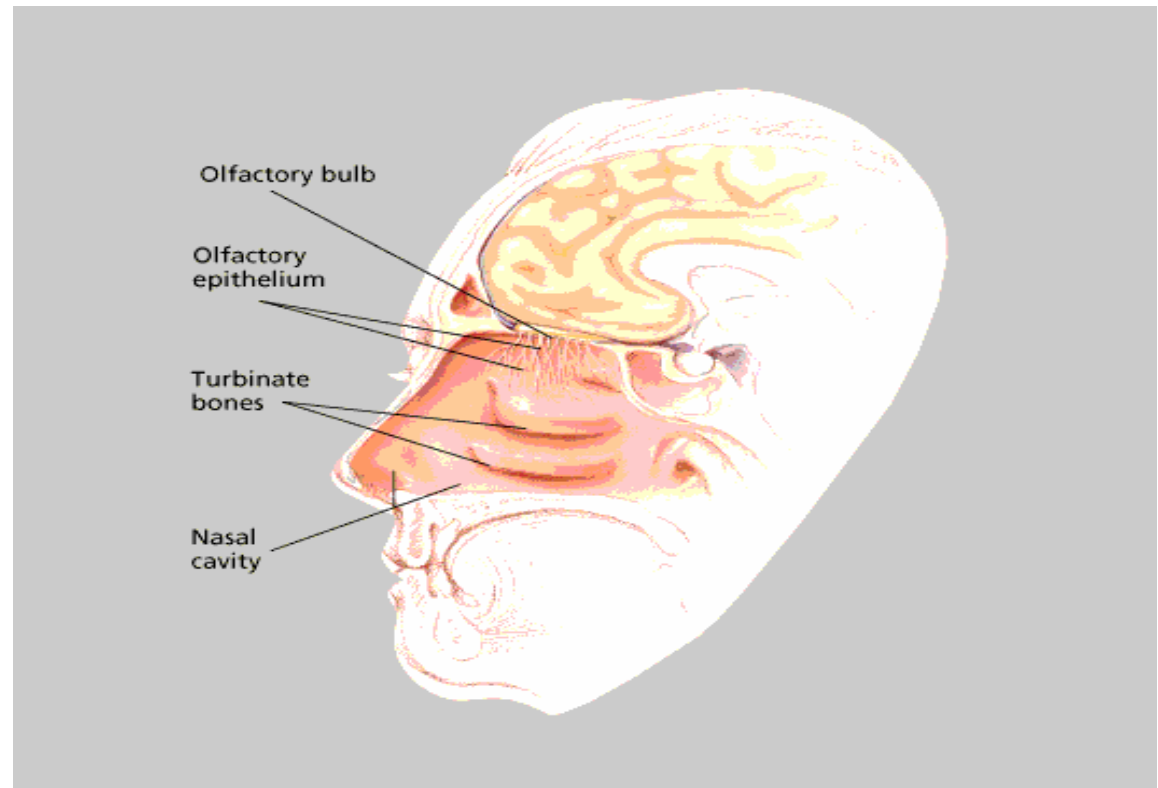


OUR SENSE OF TASTE

GUSTATORY CORTEX



OUR SENSE OF SMELL

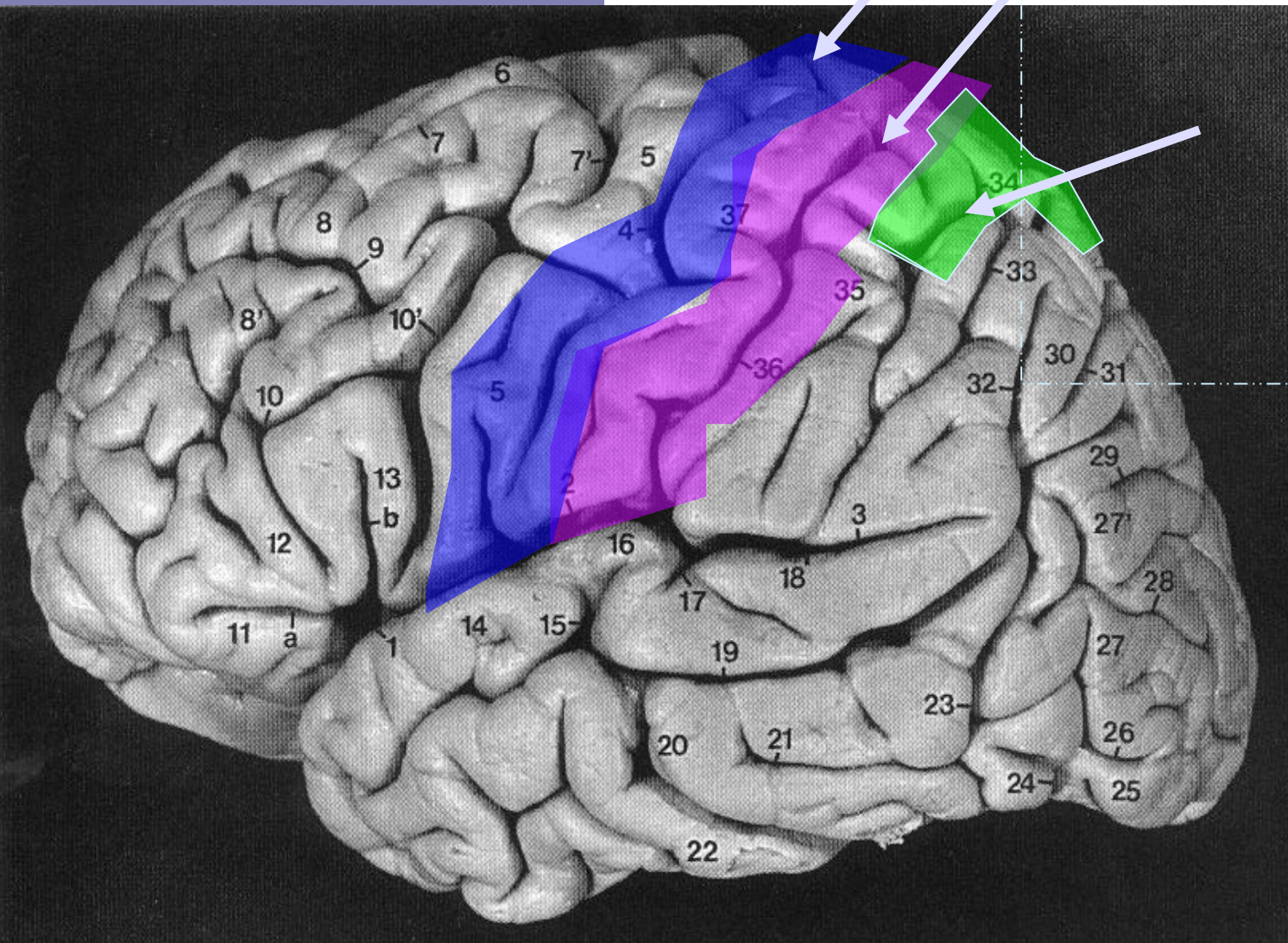


PRIMARY SOMATOSENSORY CORTEX

MOTOR CORTEX

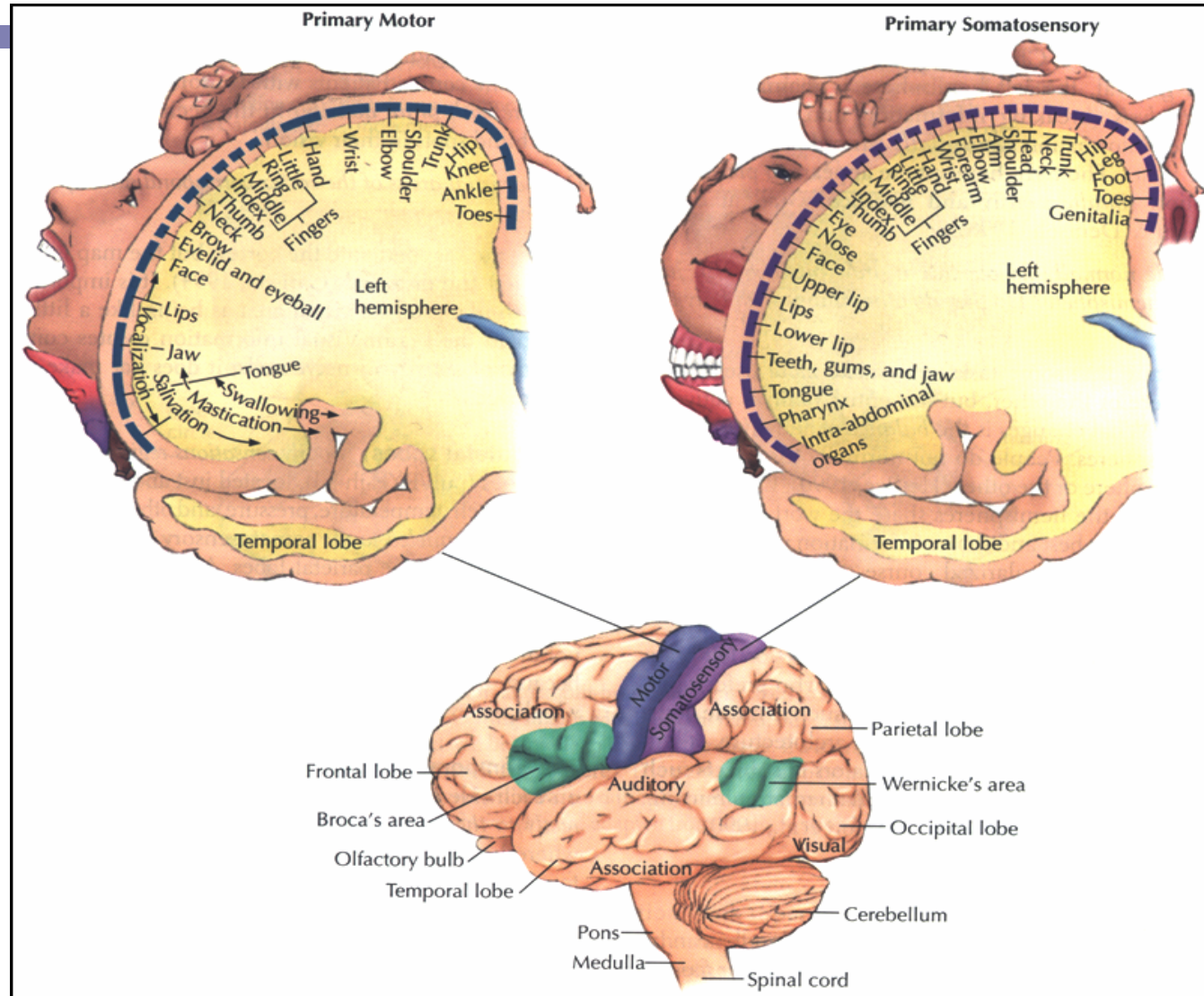
SOMATOSENSORY CORTEX

POSTERIOR PARIETAL CORTEX (touch)

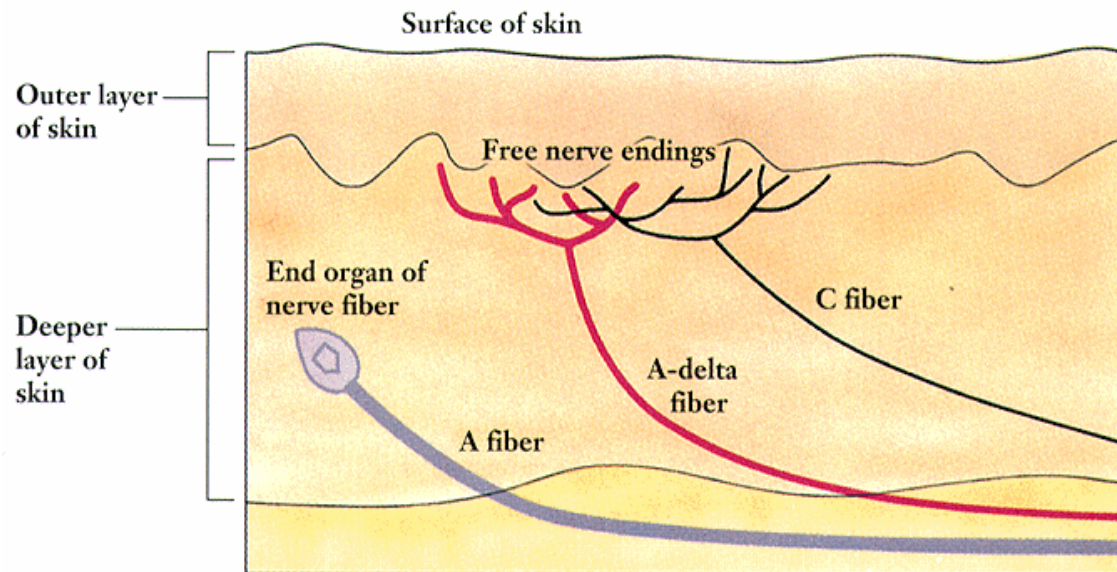


SENSORY & MOTOR CORTEX

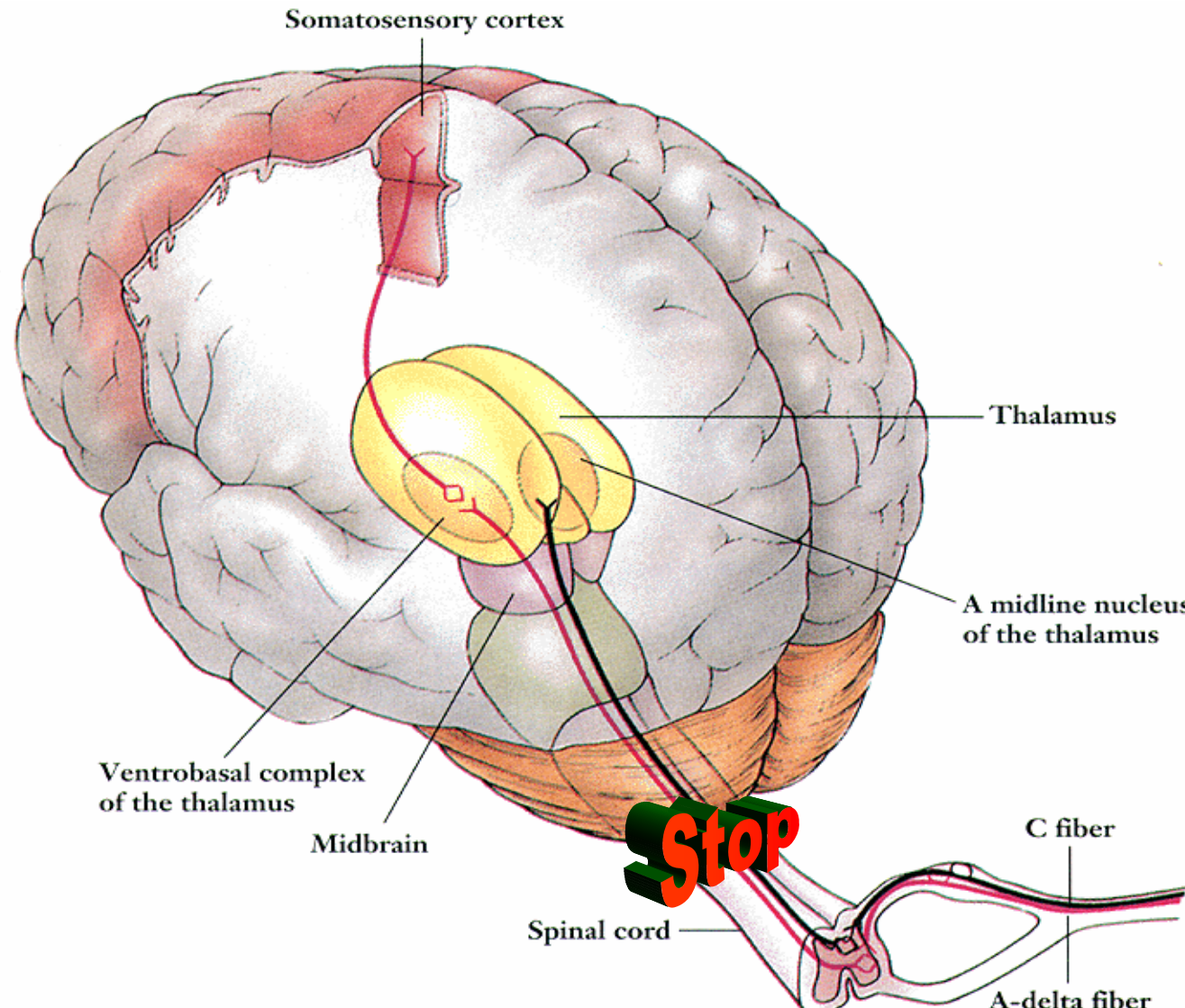
TOPGRAPHIC ORGANIZATION OF THE CORTEX



FEELING PAIN

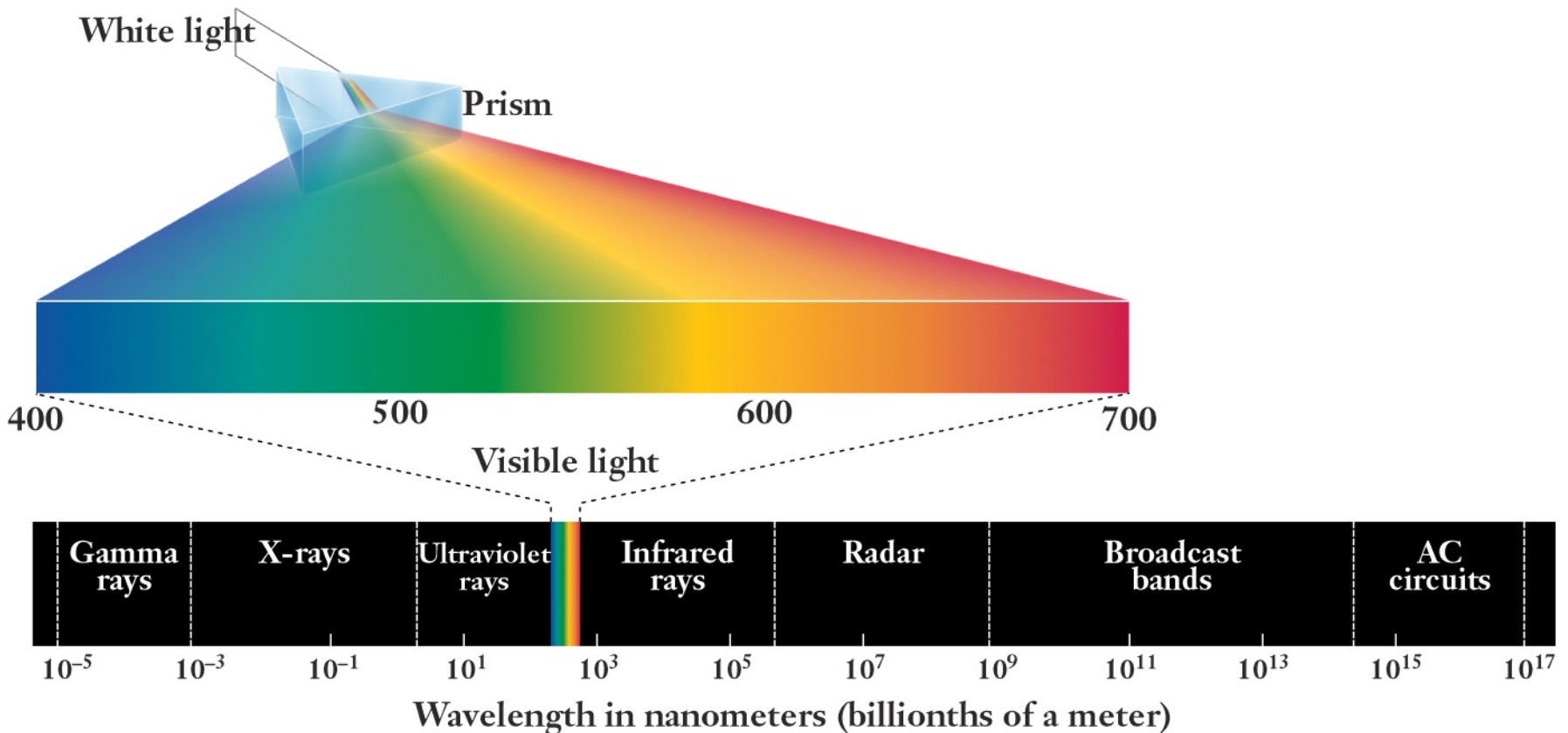


FEELING PAIN



VISION

THE STIMULUS: LIGHT WAVES



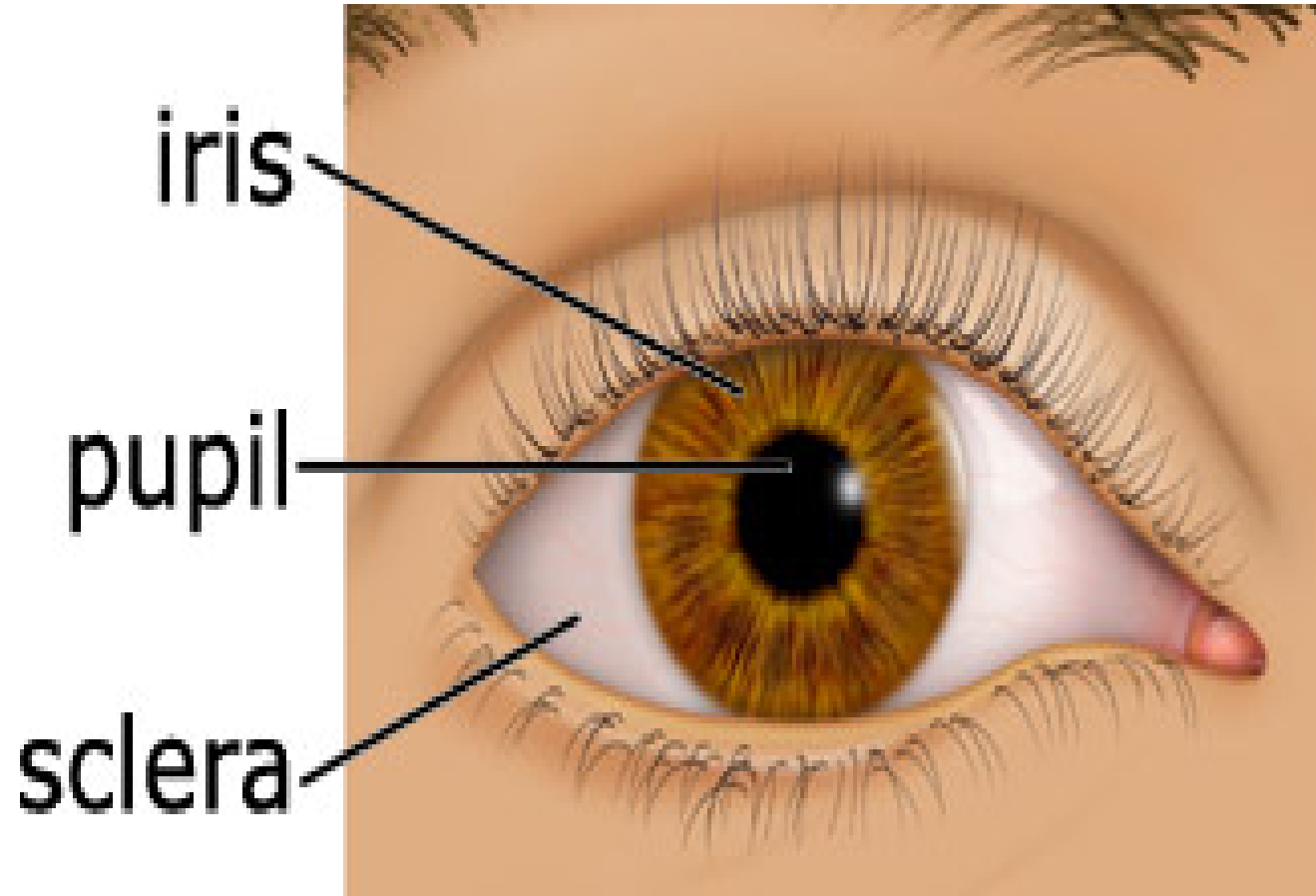
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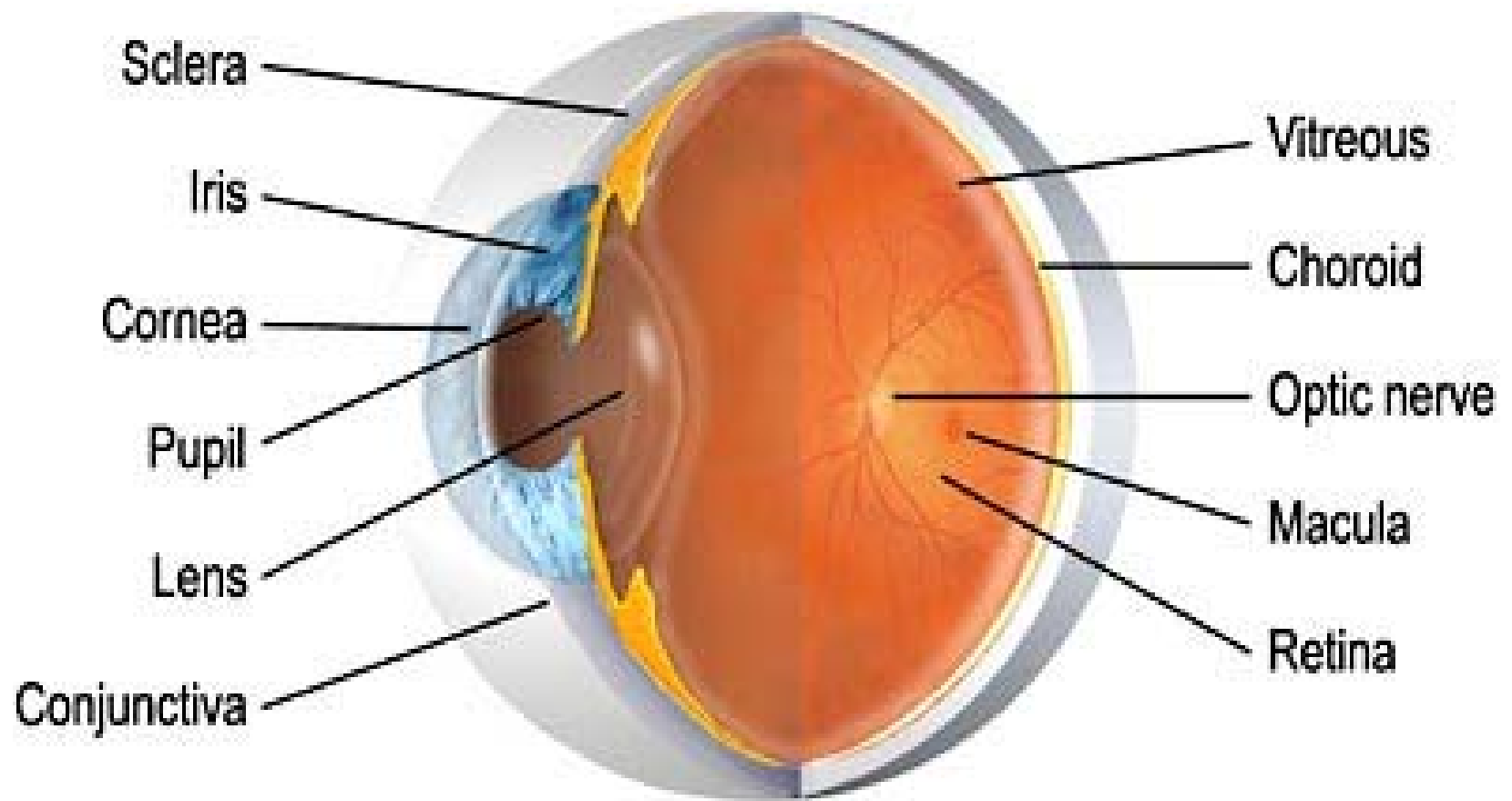
VISION

Prof. Laura Fazakas

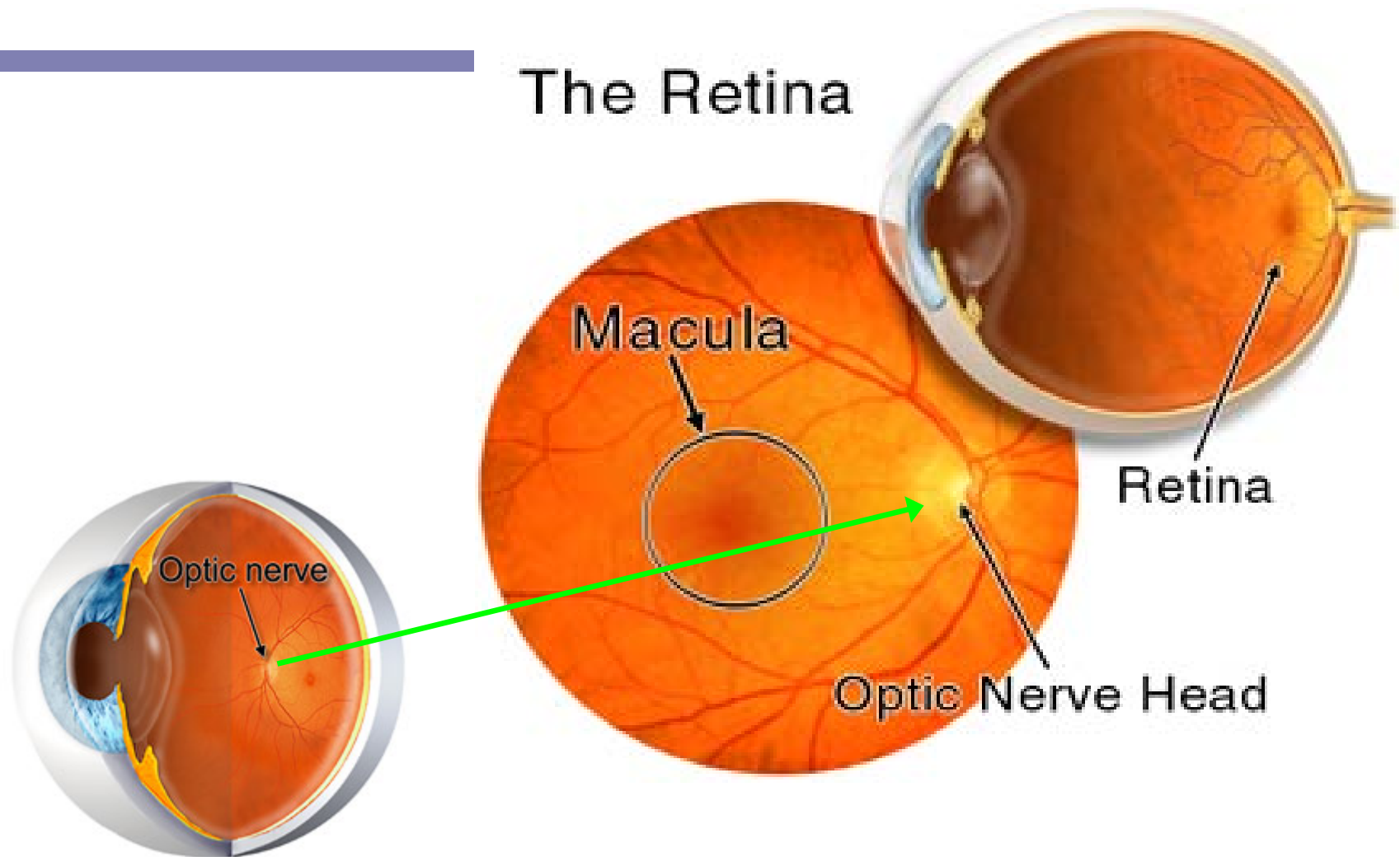
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ANATOMY OF THE EYE



A CLOSER LOOK AT THE RETINA

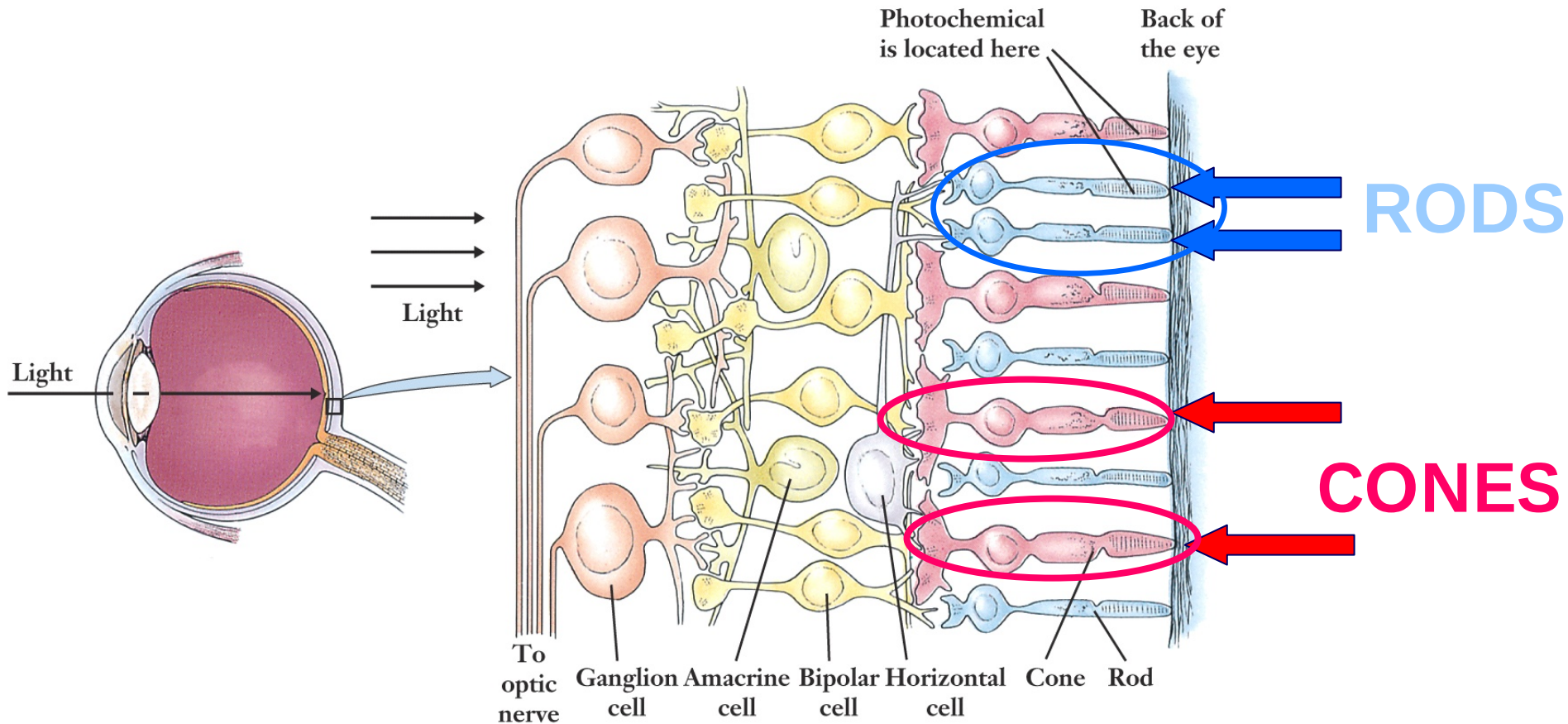


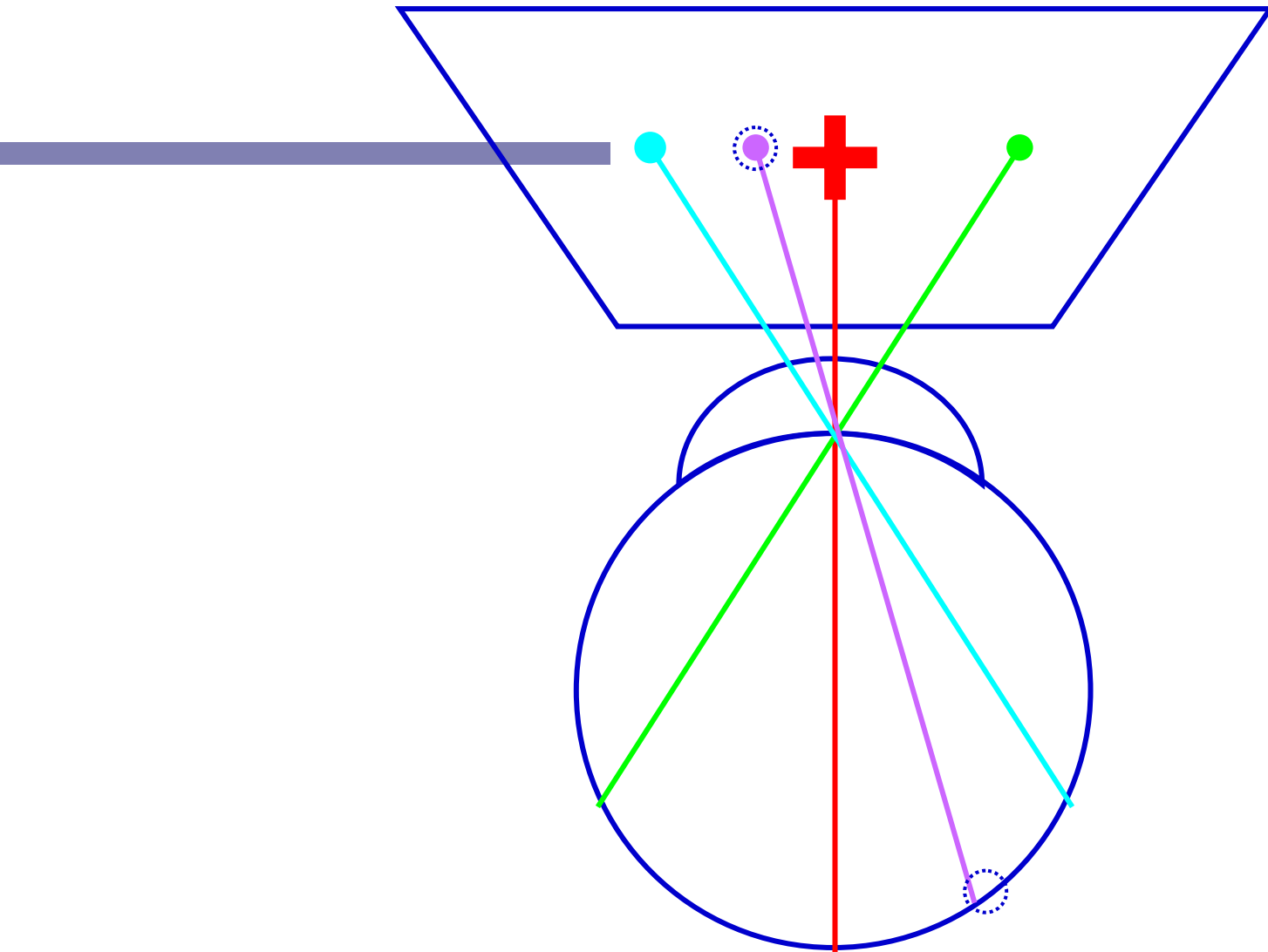
A CLOSER LOOK AT THE RETINA

PHOTORECEPTORS

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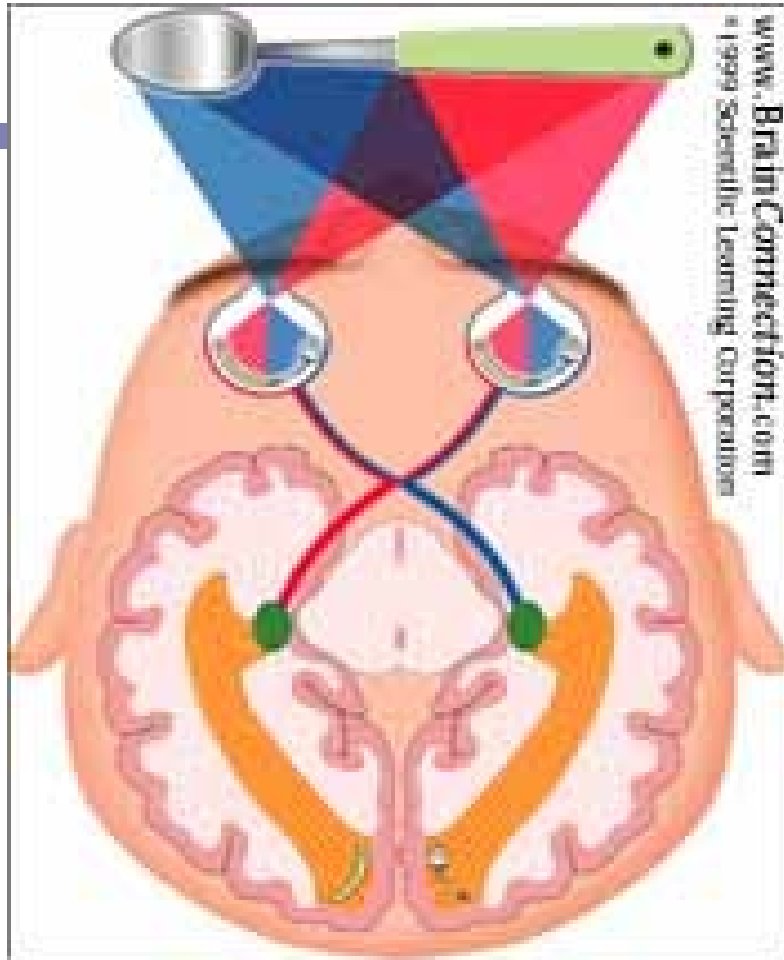


FOVEA

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NEURAL TRANSDUCTION



Photoreceptors

Optic Nerve

Thalamus

Optic Chiasm

Visual cortex

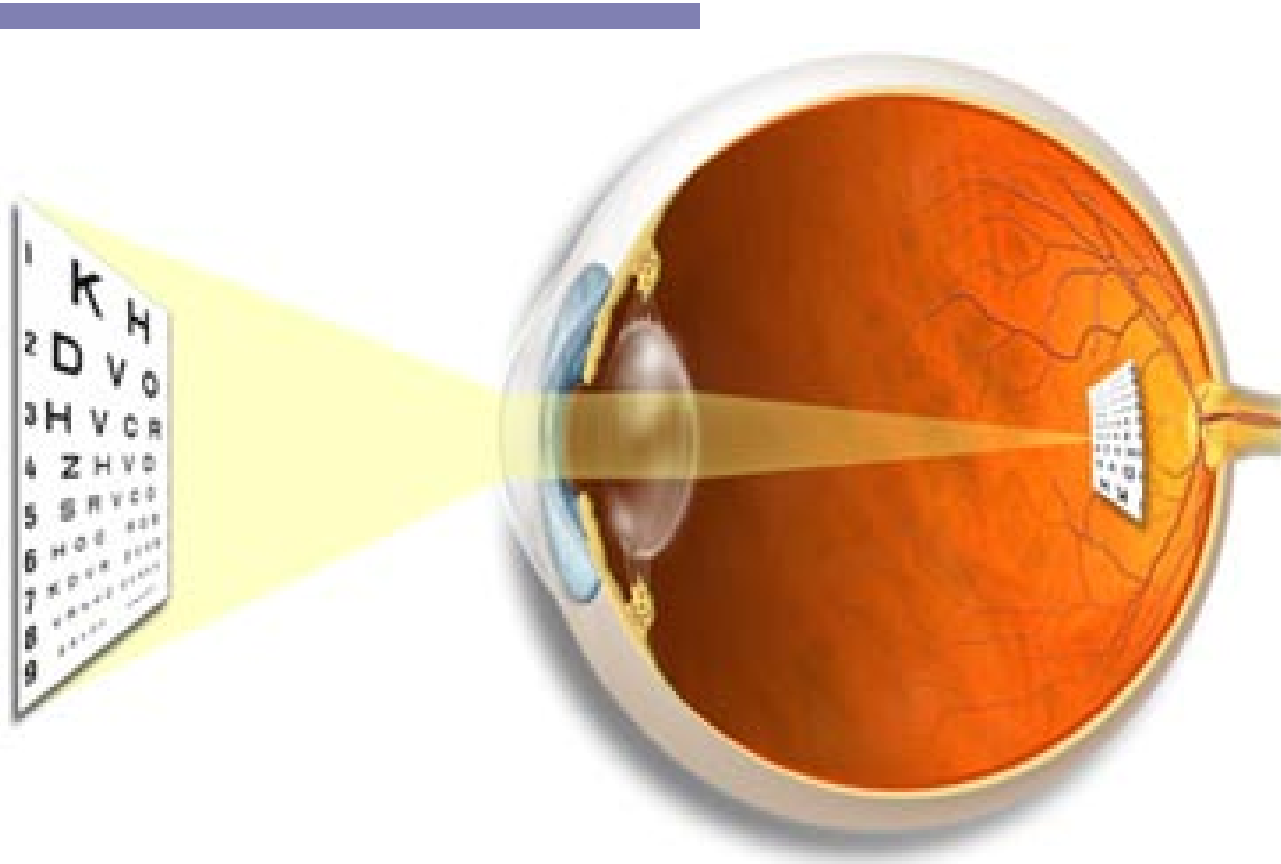
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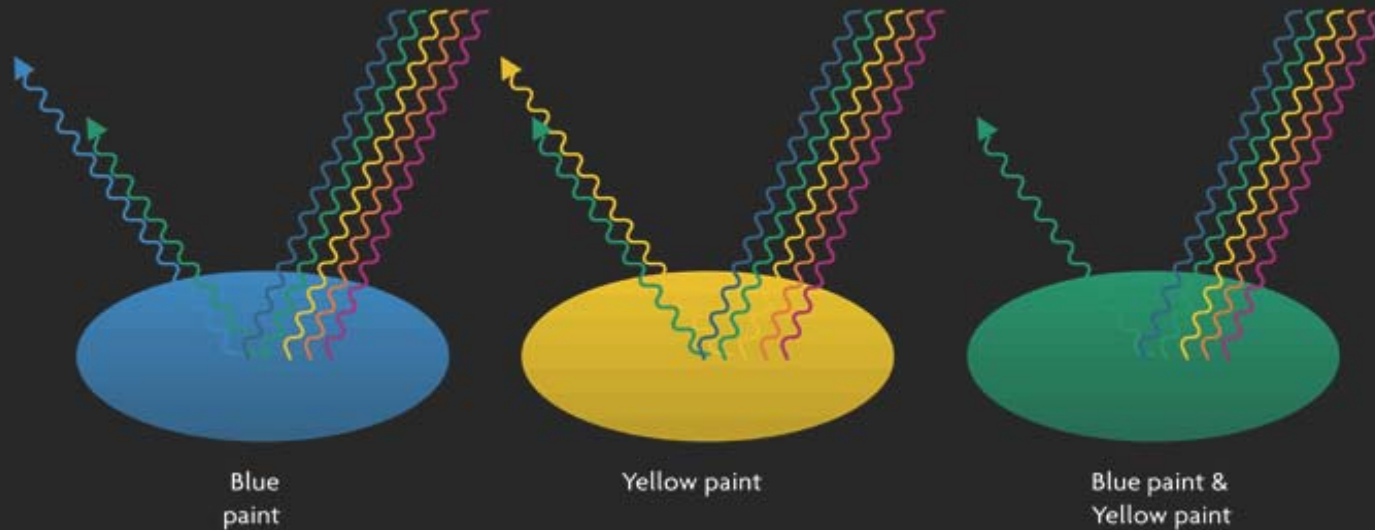
VISUAL PATHWAYS IN THE BRAIN

RETINAL IMAGE

**Image is
projected
upside-down
on the retina**



COLOUR VISION



Subtracts all
but **450 nm**

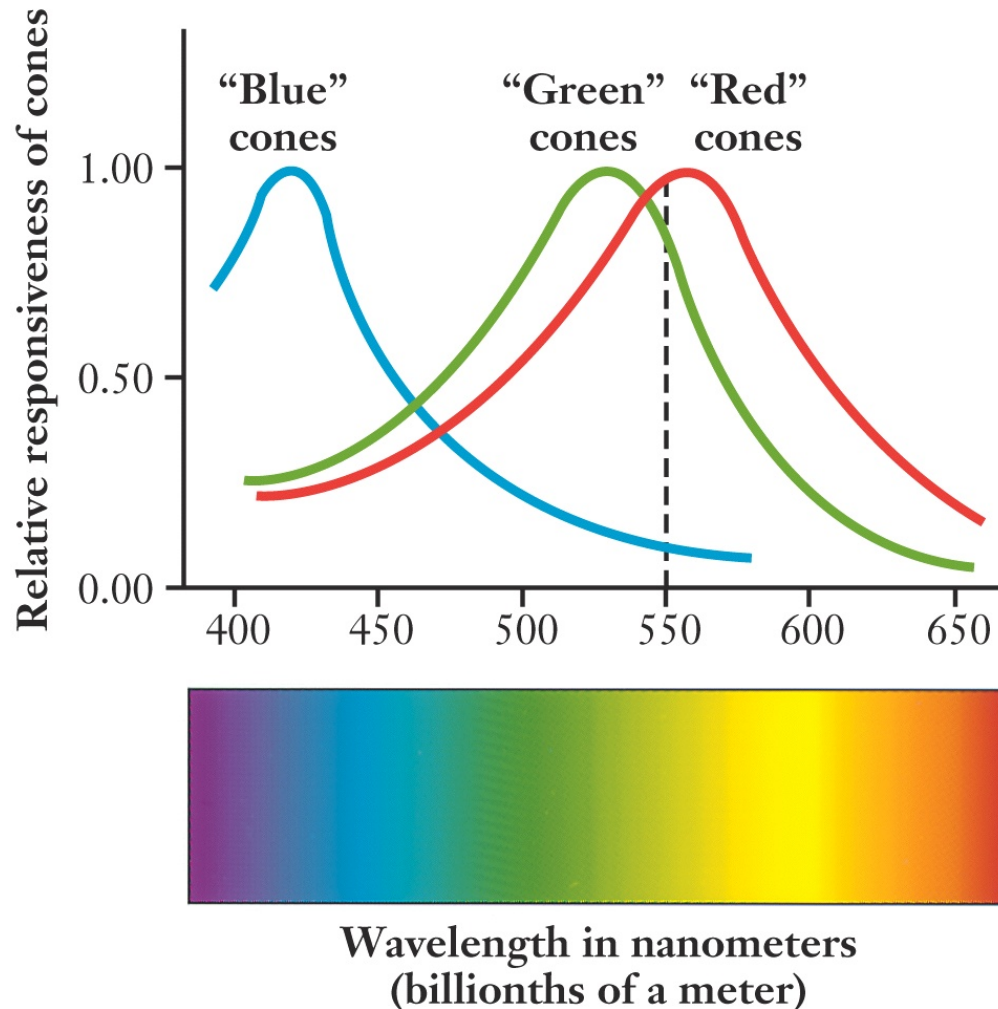
Subtracts all
but **650 nm**

Resulting colour
between 450 & 650 nm
(i.e. **550 nm**)

SUBTRACTIVE COLOUR MIXTURE

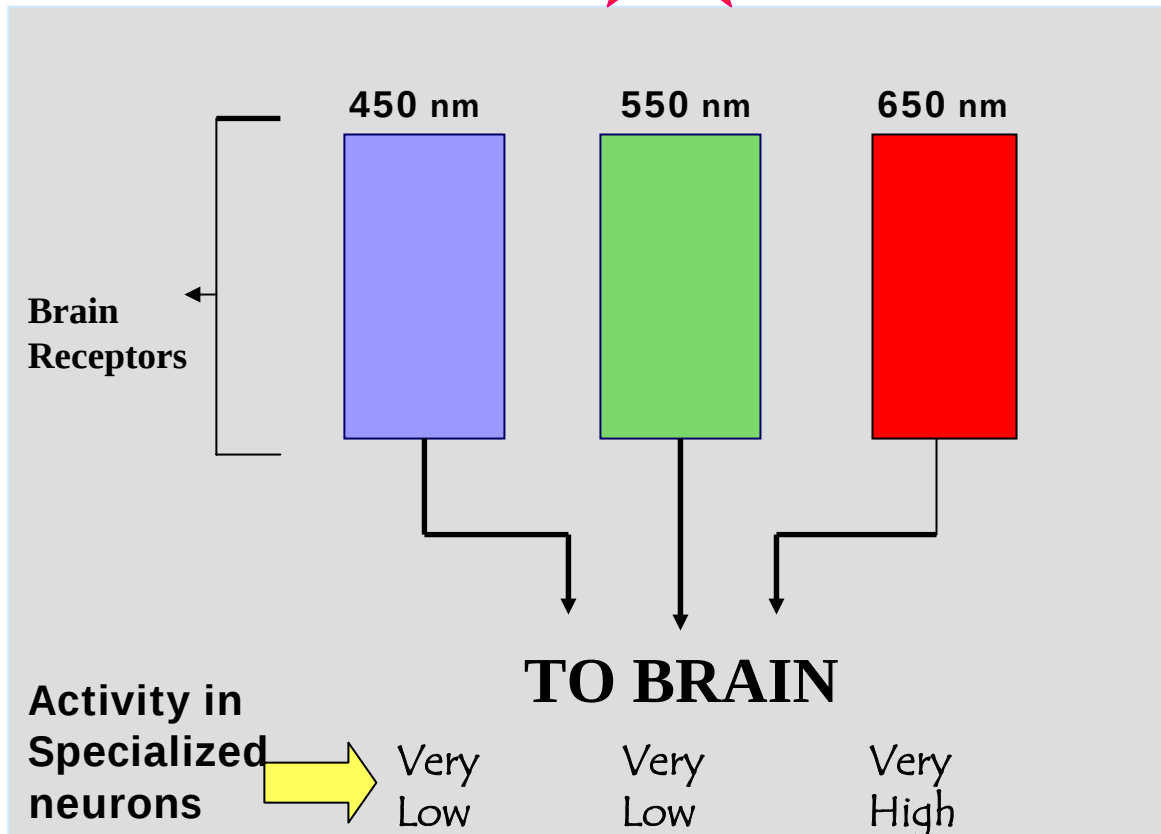
THEORIES OF COLOUR VISION

TRICHROMATIC THEORY



THEORIES OF COLOUR VISION

1. TRICHROMATIC THEORY



van Helmholtz (1800)

- 3 specialized types of receptors

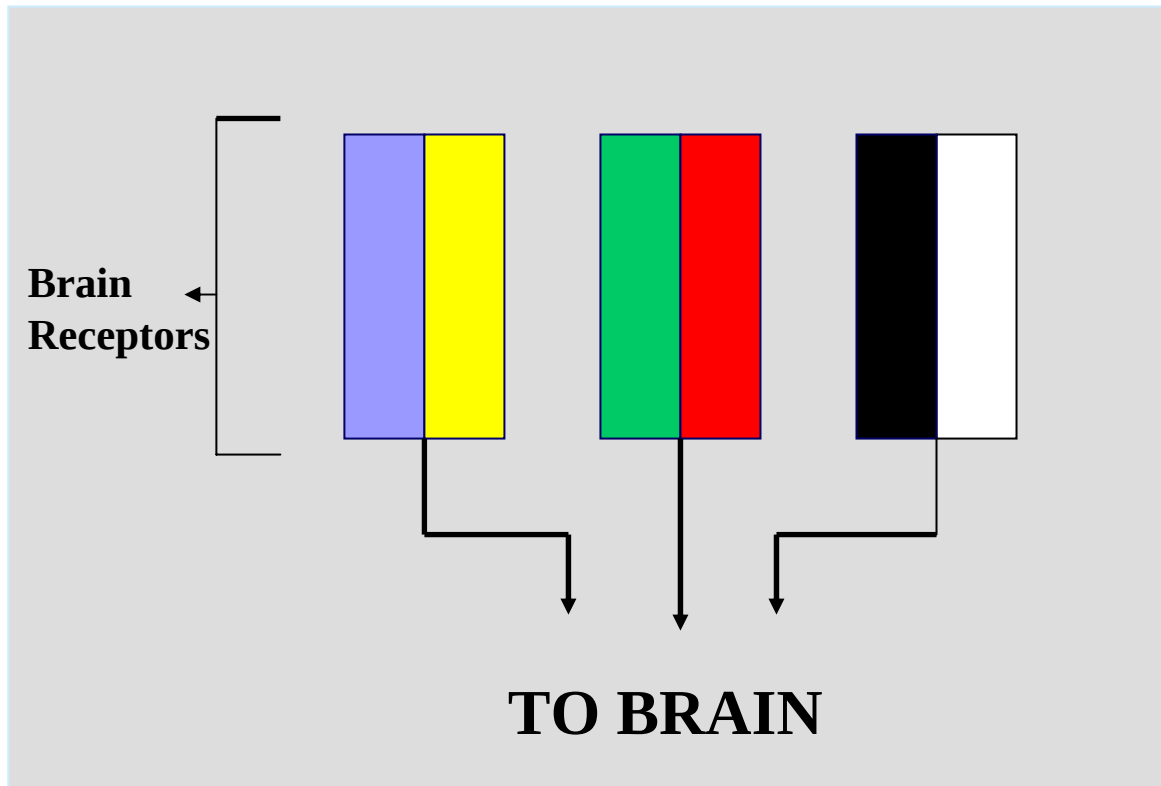
BUT, can't explain afterimages

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THEORIES OF COLOUR VISION

2. OPPONENT PROCESS THEORY



- Ewald Hering
- 3 opposing sets of colours

OPPONENT-PROCESS COLOR VISION

PERCEIVED COLOR

ACTIVITY IN 3 TYPES OF CONES

