

INTRODUCTION TO SENSES: **SENSORY RECEPTORS**

Develop from the same embryological tissue that neurons/glia do

Ectoderm

Each sensory organ (e.g. eye) has its own type of sensory receptor cell(s)
(e.g. rods and cones)

Process of Transduction

Transformation of one form of energy into another form

Environmental source of energy (e.g. light, heat, pressure, sound, chemical signals, etc.)

Environmental stimulus --- changes receptor cell's electrical signal

“**receptor potential**” is produced (like a graded potential)

Receptor potential produces a graded potential in first sensory neuron

Which is usually a graded depolarization (like an “EPSP”)

“**generator potential**”

Generator potential exceeds firing threshold of first sensory neuron ---

first sensory neuron “fires” (has an **action potential**) and this fires the next neuron in line, etc.

Note: There are **two basic types of “information” in the nervous system**:

1. How fast is a neuron firing

“**frequency**” **code** (e.g. number of action potentials per second)

2. Which individual neuron is firing

“**labeled line**” **code** (e.g. neuron X fires only when its receptor is stimulated by red light; neuron Y fires only when its receptor is stimulated by green light)

“**what**” is stimulus? – LL code (light vs. sound)

“**where**” is stimulus? – LL code (above me vs. below me)

“**how intense**” is stimulus? – F code (bright vs. dim)

“**duration**” of stimulus – F code (still going or stopped now)