

CORNELL NOTES

Directions: You must create a minimum of 5 questions in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be stamped after each assigned sections (if completed) and turned in to your teacher at the end of the Unit for scoring.

UNIT 6: HUMAN BIOLOGY

Chapter 28: Human Systems and Homeostasis

I. Levels of Organization (28.1)

A. Specialized cells develop from a single _____

1. **zygote**- cell formed from fusion of ____ and _____

2. zygote can divide and **differentiate** into more than _____ **different types** of human cells

3. Cell specialization involves two main steps: **determination** and **differentiation**

a. **Embryonic** _____ **cells**- first cells produced from zygote that have potential to become any type of cell

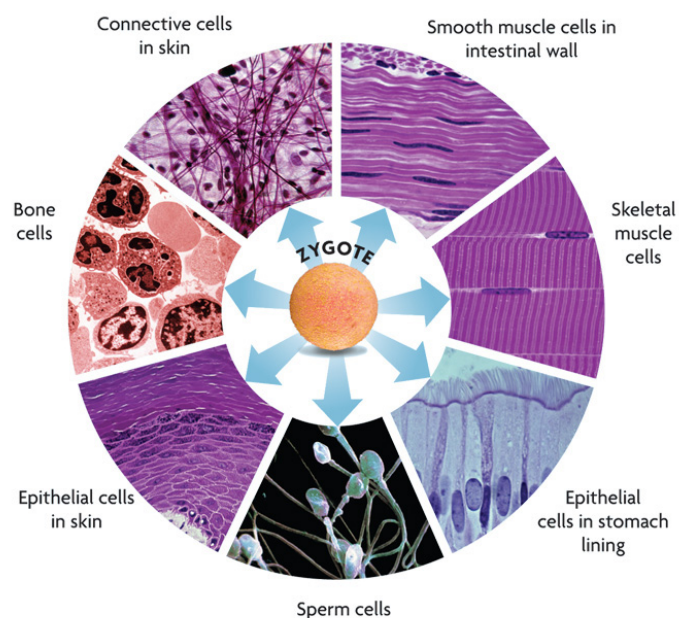
b. **Determination**- process by which stem cells become _____ to develop into one type of cell

1). Still retains information needed to build an entire _____

2). Have lost ability to _____ some of this information

c. **Differentiation**- process by which committed cells acquire the _____ and _____ of highly specialized cells

Cells develop specialized structures and functions during differentiation.



B. Specialized cells function together in tissues, organs, organ systems, and the whole organism

1. _____ - Individual specialized cell
2. _____ - groups of similar cells that work together to perform specialized function
3. _____ - different tissues that function together
4. _____ - two or more organs working in coordinated way
5. _____ - together, organ systems make up entire organism

C. There are _____ main organ systems in the body

SYSTEM	MAJOR TISSUES AND ORGANS	PRIMARY FUNCTION
Circulatory	heart, blood vessels, blood, lymph nodes, lymphatic vessels	transports oxygen, nutrients, wastes; helps regulate body temperature; collects fluid lost from blood vessels and returns it to circulatory system
Digestive	mouth, pharynx, esophagus, stomach, small intestine, pancreas, gallbladder, liver	breaks down and absorbs nutrients, salts, and water; eliminates some wastes
Endocrine	hypothalamus, pituitary, thyroid, parathyroid, adrenals, pancreas, ovaries, testes	influences growth, development, metabolism; helps maintain homeostasis
Excretory	skin, lungs, kidneys, bladder, large intestine	eliminates waste products; helps maintain homeostasis
Immune	white blood cells, thymus, spleen	protects against disease; stores and generates white blood cells
Integumentary	skin, hair, nails, sweat and oil glands	acts as a barrier against infection, injury, UV radiation; helps regulate body temperature
Muscular	skeletal, smooth, and cardiac muscles	produces voluntary and involuntary movements; helps to circulate blood and move food through digestive system
Nervous	brain, spinal cord, peripheral nerves	regulates body's response to changes in internal and external environment; processes information
Reproductive	<i>male:</i> testes, penis, associated ducts and glands <i>female:</i> ovaries, fallopian tubes, uterus, vagina	produces reproductive cells; in females, provides environment for embryo
Respiratory	nose, sinuses, pharynx, larynx, trachea, lungs	brings in O ₂ for cells; expels CO ₂ and water vapor
Skeletal	bones, cartilage, ligaments, tendons	supports and protects vital organs; allows movement; stores minerals; serves as the site for red blood cell production

II. Mechanisms of **Homeostasis** (28.2)

A. Conditions within the body must remain within a narrow range

1. You live in constantly **changing** _____
2. Your body must cope with change in temperature, pollution, infection, stress, and many other conditions
3. _____ - regulation and maintenance of internal environment that supports _____
4. Control systems in the body

- a. _____ - also called receptors, gather information about conditions inside and outside body
- b. **Control center**- receives information from the _____ and _____ (E.g. brain and spinal cord)
- c. **Communication system**- controlled by _____ and _____ system and carry messages to all parts of the body
- d. _____ - any organ, tissue, or cell that changes its level of activity in response to message

B. Negative feedback loops are necessary for **homeostasis**

- 1. _____ - information from sensors that allows control center to compare current conditions to set of ideal values
- 2. **Feedback** _____ - information moves continuously among sensors, control center, and a target
- 3. _____ **feedback**- control system that counteracts any change in body the moves condition above or below set point
 - a. _____ is good example
 - b. Body's temperature regulation, blood pH levels, salts, sugar levels, hunger, etc.
- 4. _____ **feedback**- uses information from sensors to _____ rate of change
 - a. not as common as negative feedback
 - b. Important when _____ change is needed

III. Interactions among systems (28.3)

A. Each organ system _____ other organ systems

- 1. Each organ system in your body must do its own special _____
- 2. To remain healthy, each system also must coordinate with other organ systems through _____ messages and nerve _____

3. **Thermoregulation**- process of maintaining steady body _____

a. **Muscular system**- _____ in cold weather to generate _____

b. **Skin (Integumentary) system**- _____ in hot weather to _____ you down.

c. Uses **feedback** to keep temperature within set _____

B. A **disruption** of homeostasis can be _____

1. Some changes can be too _____ or **too** _____ to control through feedback mechanisms

a. Sensors _____ to detect changes

b. **Wrong messages** may be sent or fail to reach their _____

c. **Serious injuries** can _____ the homeostatic mechanisms

d. _____ or _____ can change the body's internal chemistry

2. **Short-term effects**

a. E.g. Cold _____ attacking body- returns to _____ in a few days or weeks.

b. Usually no lasting _____ to your body

3. **Long-term effects**

a. E.g. _____ - can cause more damage

b. Diabetes can result in heart disease, blindness, nerve damage, kidney damage, and even coma and _____