

# Levels of Organization

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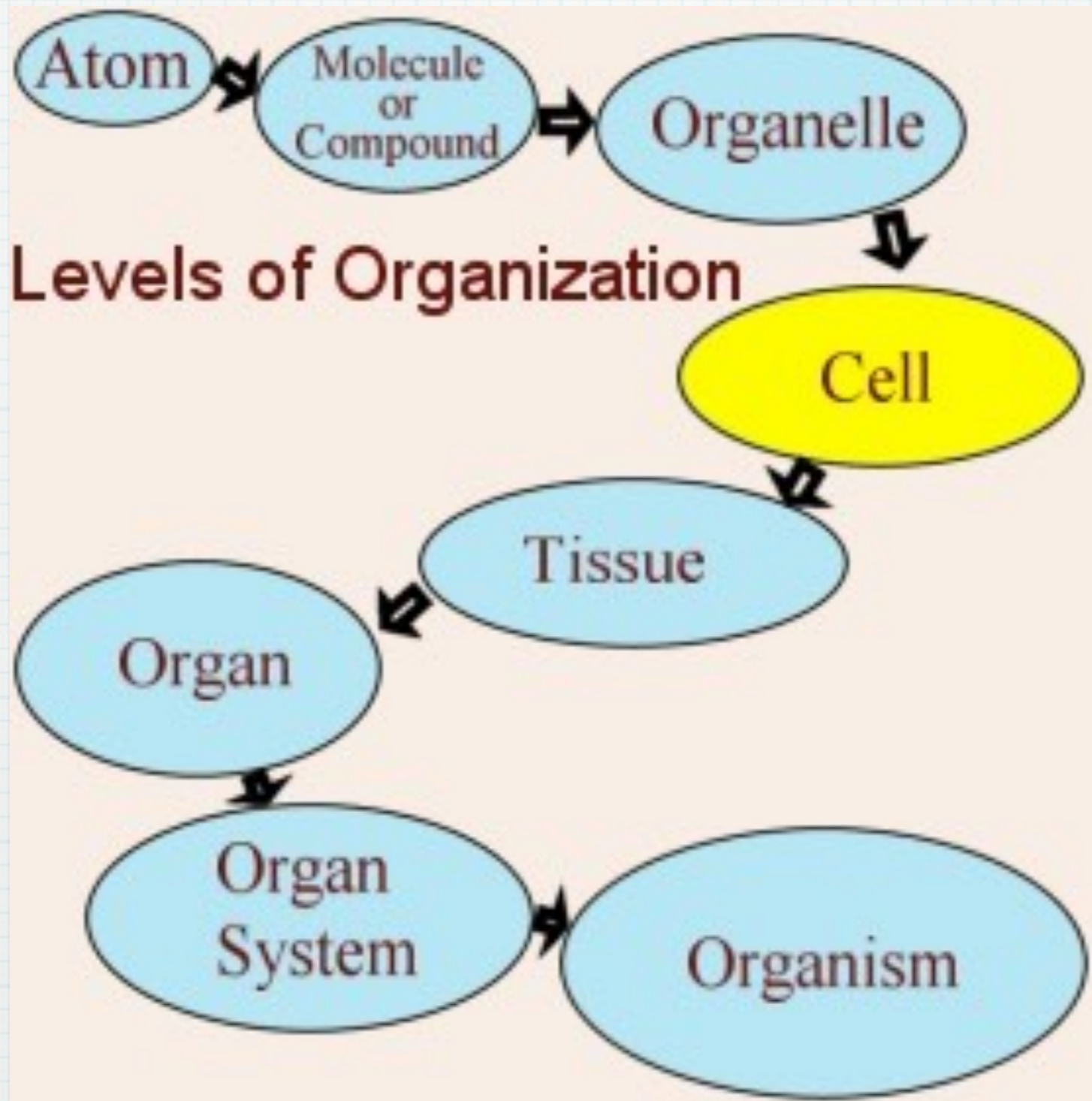
- \* The human body is structured into systems.**
- \* Cells are the smallest unit of life.**
- \* Cells similar in shape and function work together as tissues.**
- \* Different types of tissues form organs to carry out particular functions.**



- \* Examples of complex organs are your hands, stomach, kidneys and heart.
- \* Organs that have related structures or functions work together as an organ system.



# Levels of Organization





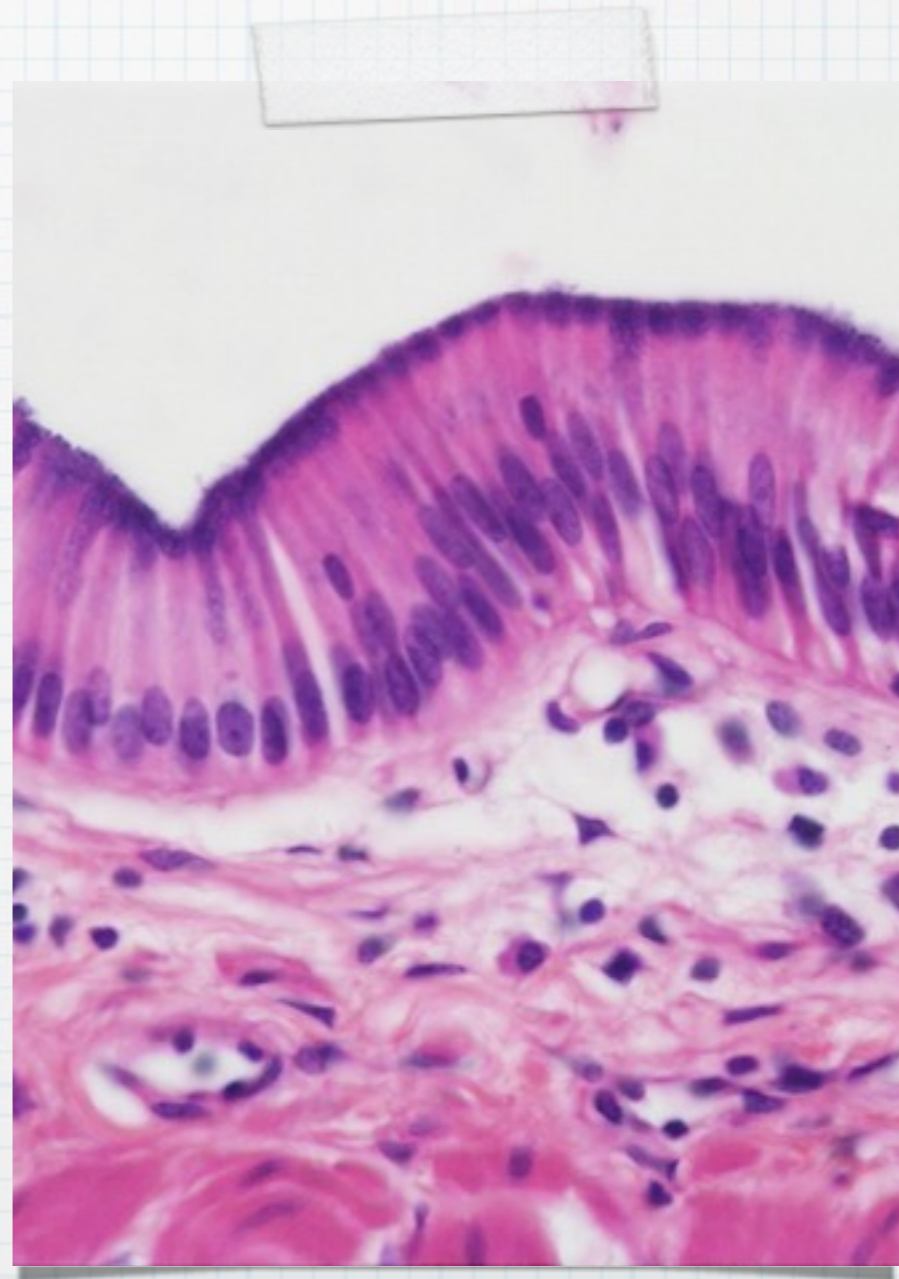
# Terminology

- \* **Tissue:** A group of cells that work together to perform a specialized task.
- \* **Organ:** A structure composed of different tissues specialized to carry out a specific function.
- \* **Organ System:** A group of organs that have related functions.



# Types of Tissues

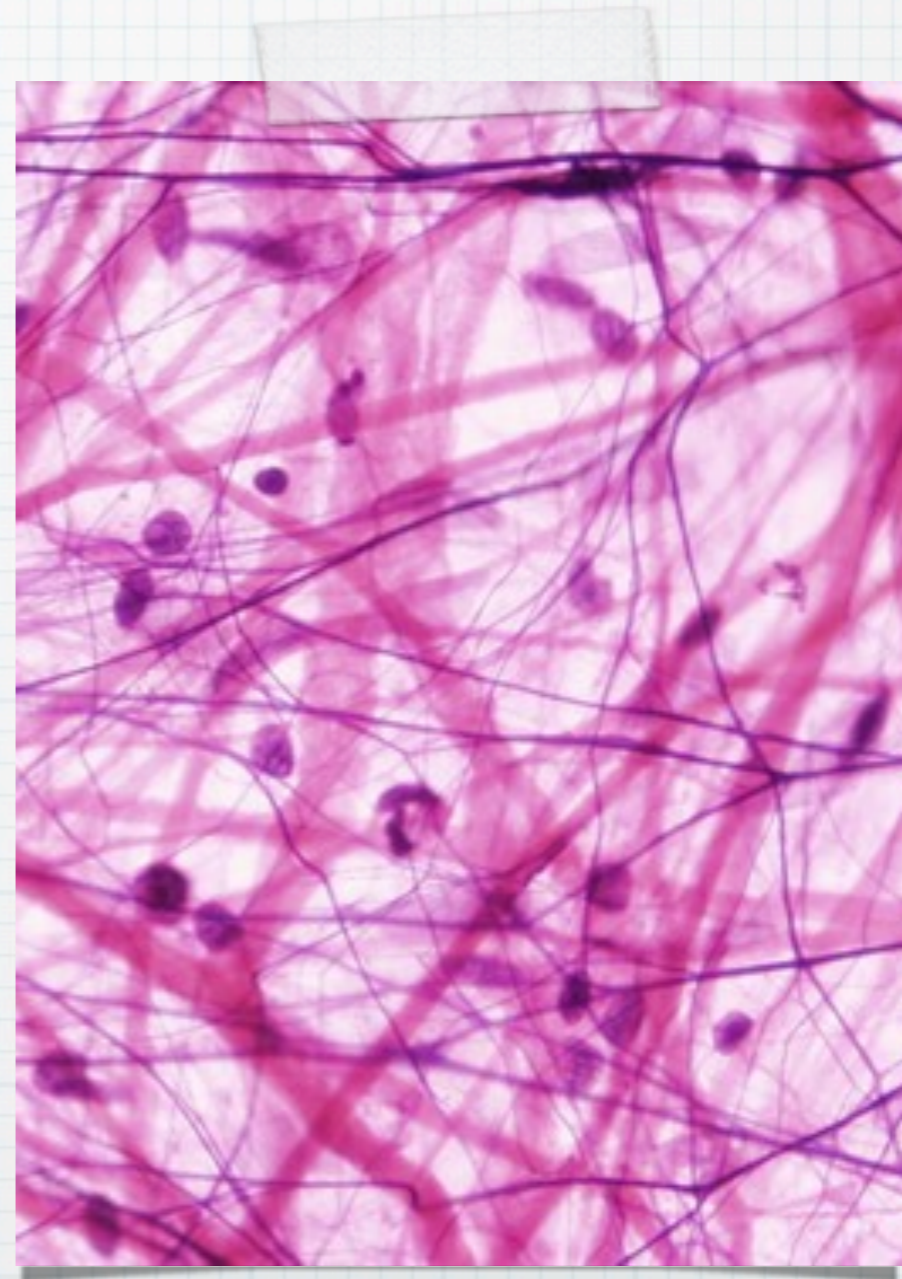
- \* Epithelial Tissues: covering that protect organs, lines body cavities, and covers the surface of the body.
- \* Example: skin: lining of the stomach





# Types of Tissues

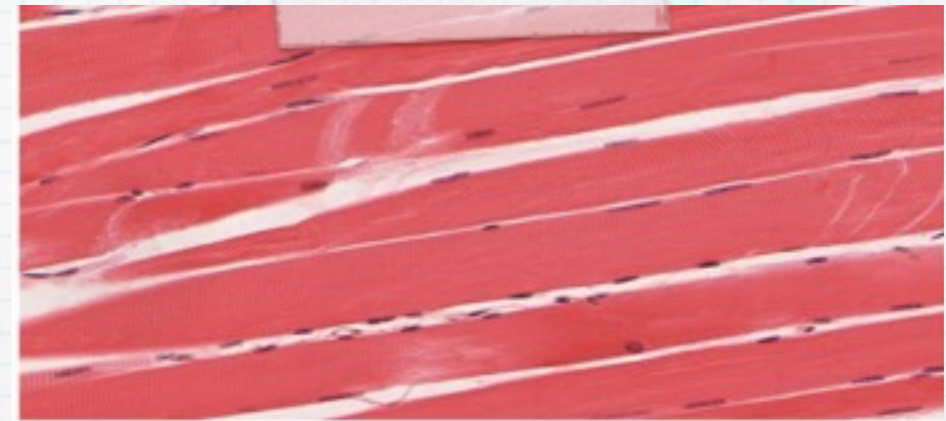
- \* **Connective Tissue:** provides support and holds various parts of the body together.
- \* **Example:** cartilage, bone, fat, blood





# Types of Tissues

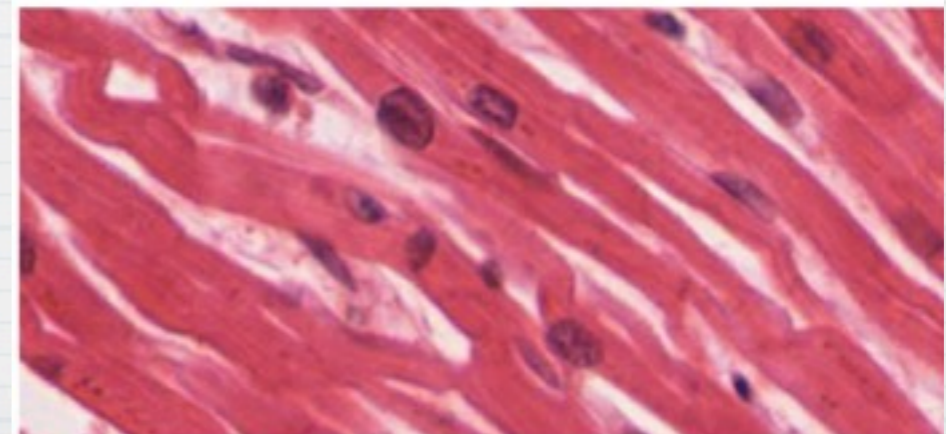
- \* **Muscle Tissue:** contain sheets or bundles of muscle cells that contract to produce movement.
- \* **Example:** Heart, bicep, hamstring smooth lining of stomach



(a)



(b)

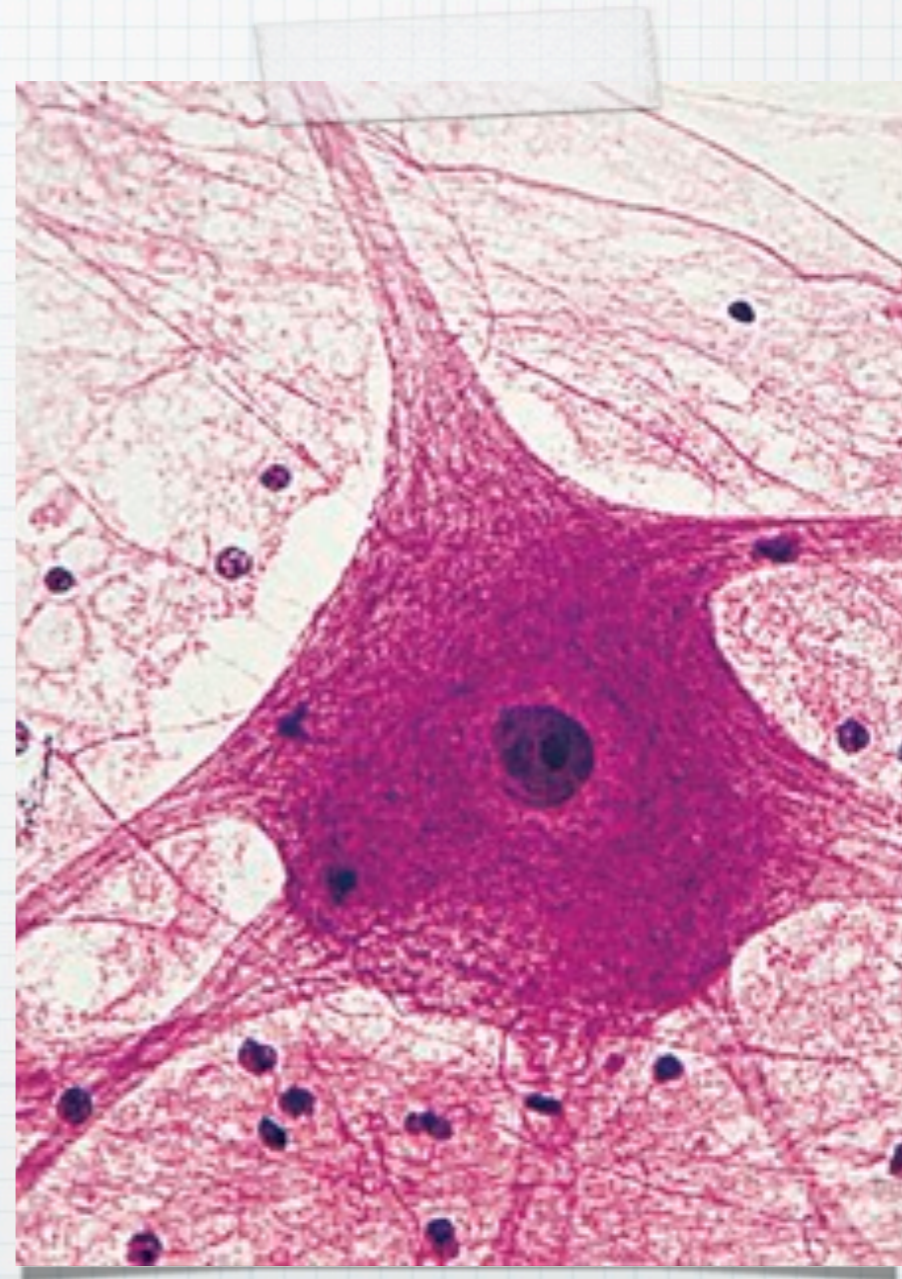


(c)



# Types of Tissues

- \* **Nervous Tissue:**  
provides  
communication  
between all body  
structures.
- \* **Example:** Neurons,  
spinal cord, sensory  
receptors





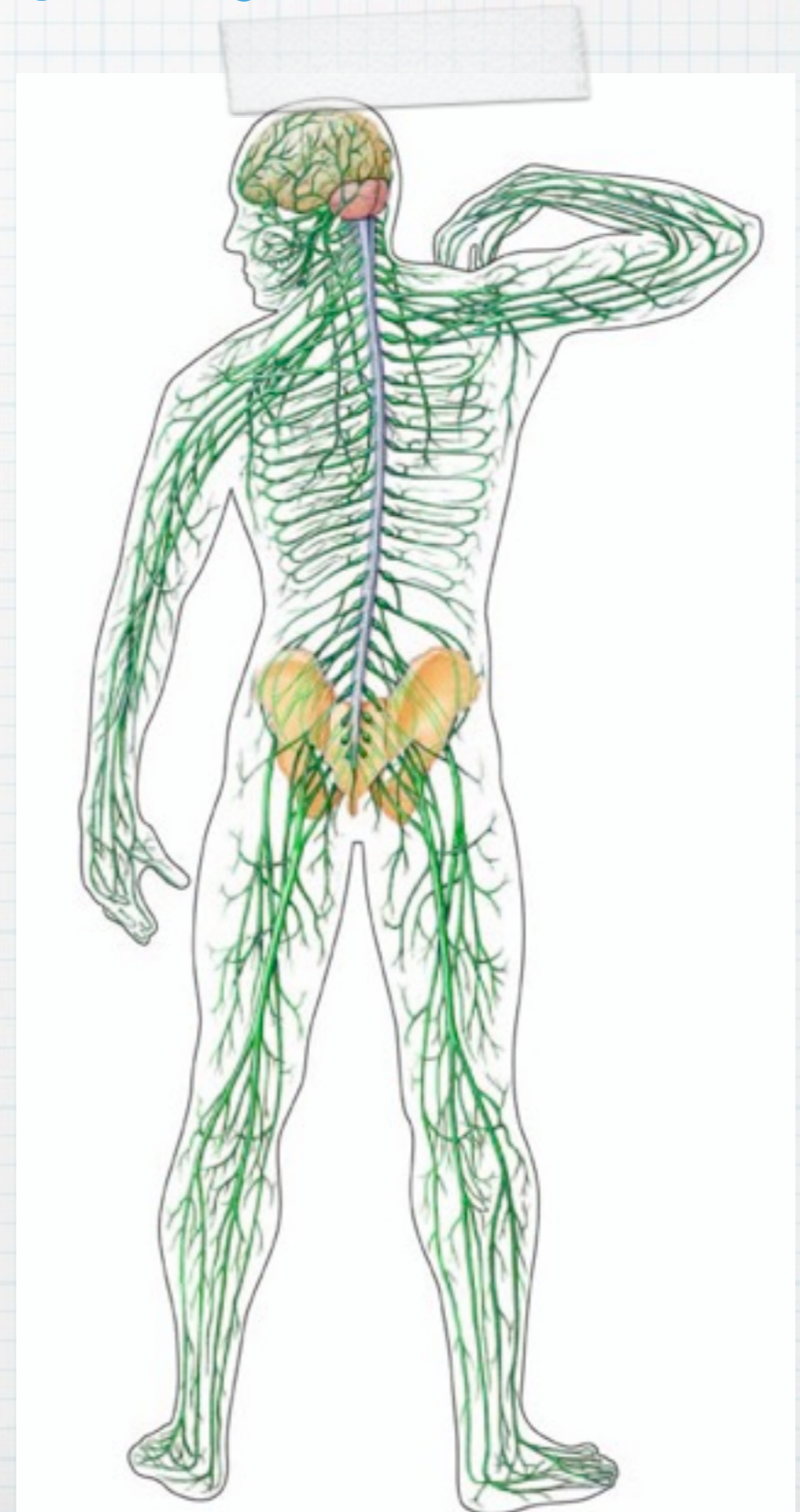
# Organ Systems That Coordinate Communication



# Organ Systems

- \* Nervous System

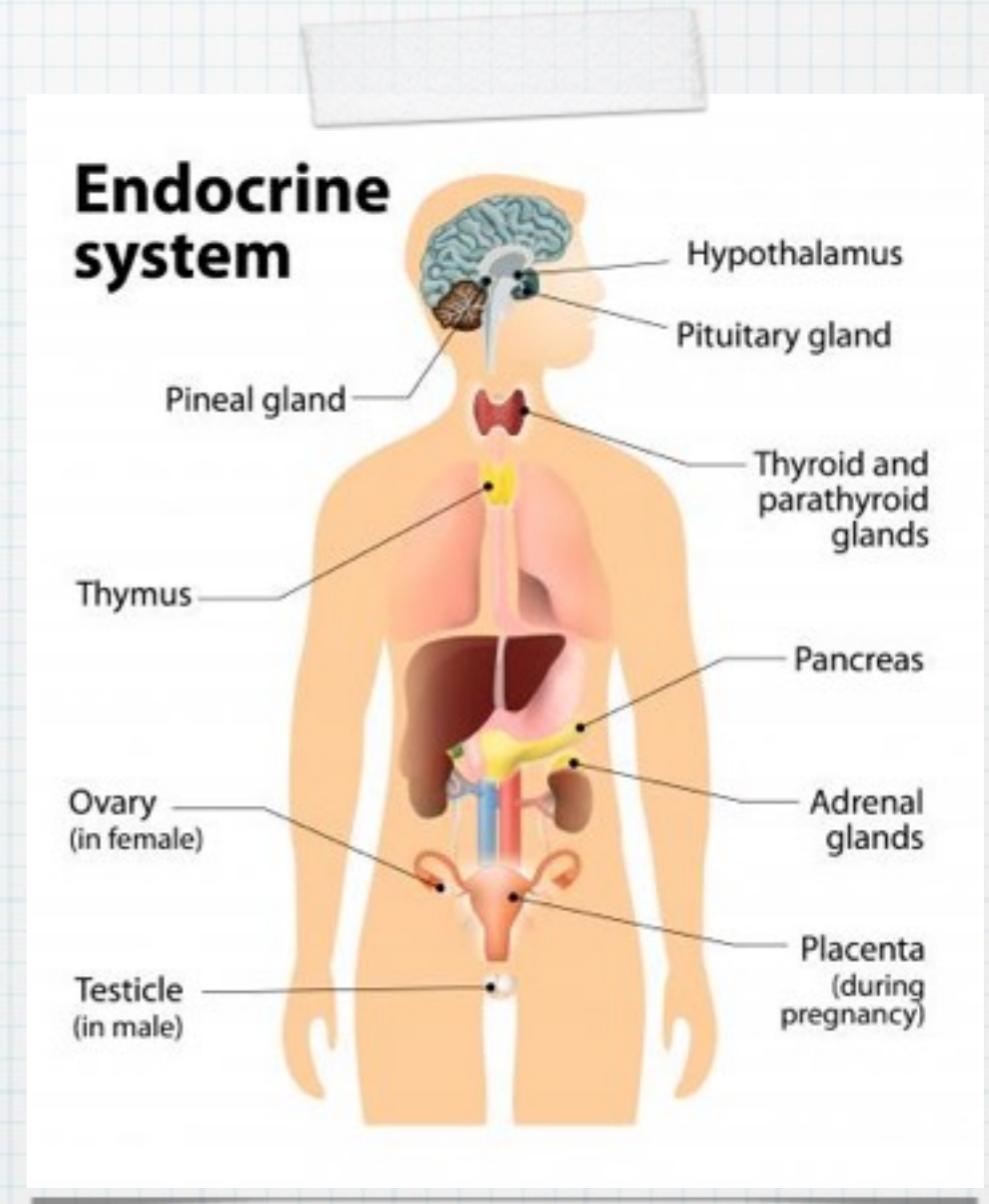
- \* Series of nerves that allow electrical signals to and from the brain





# Organ Systems

- \* Endocrine System
- \* Release hormones that are chemical signals.



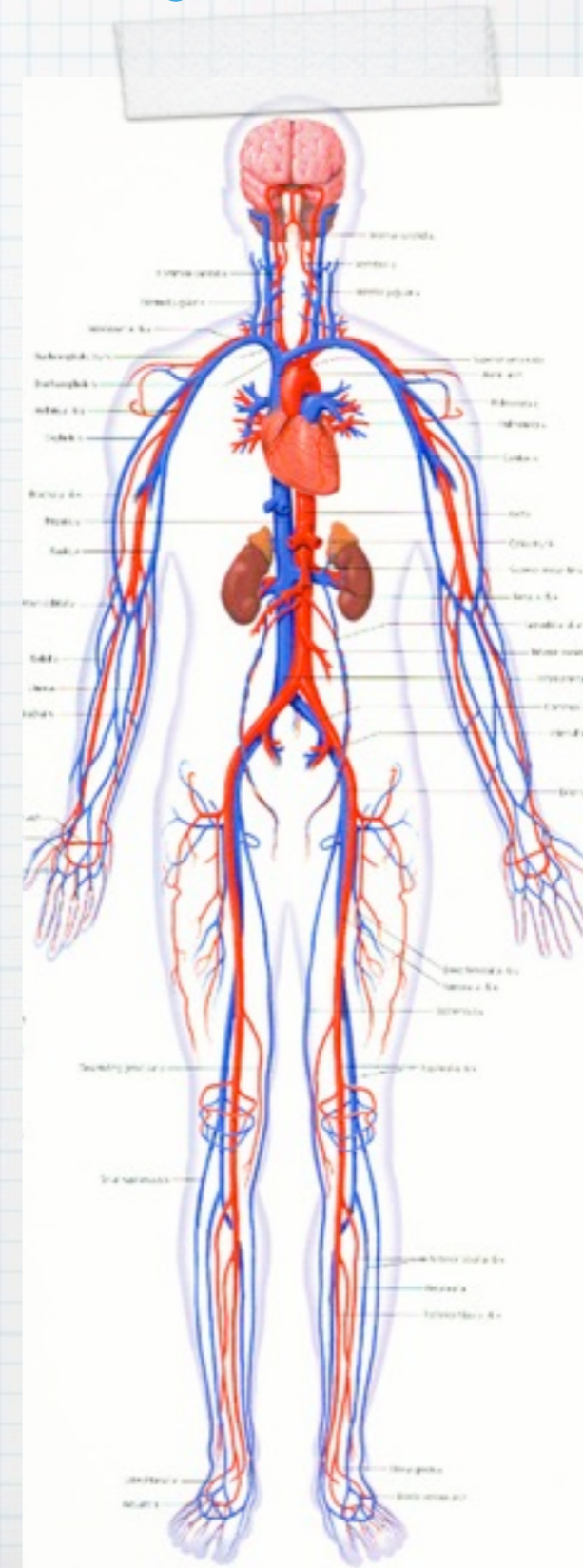


# Organ Systems That Transport



# Organ Systems

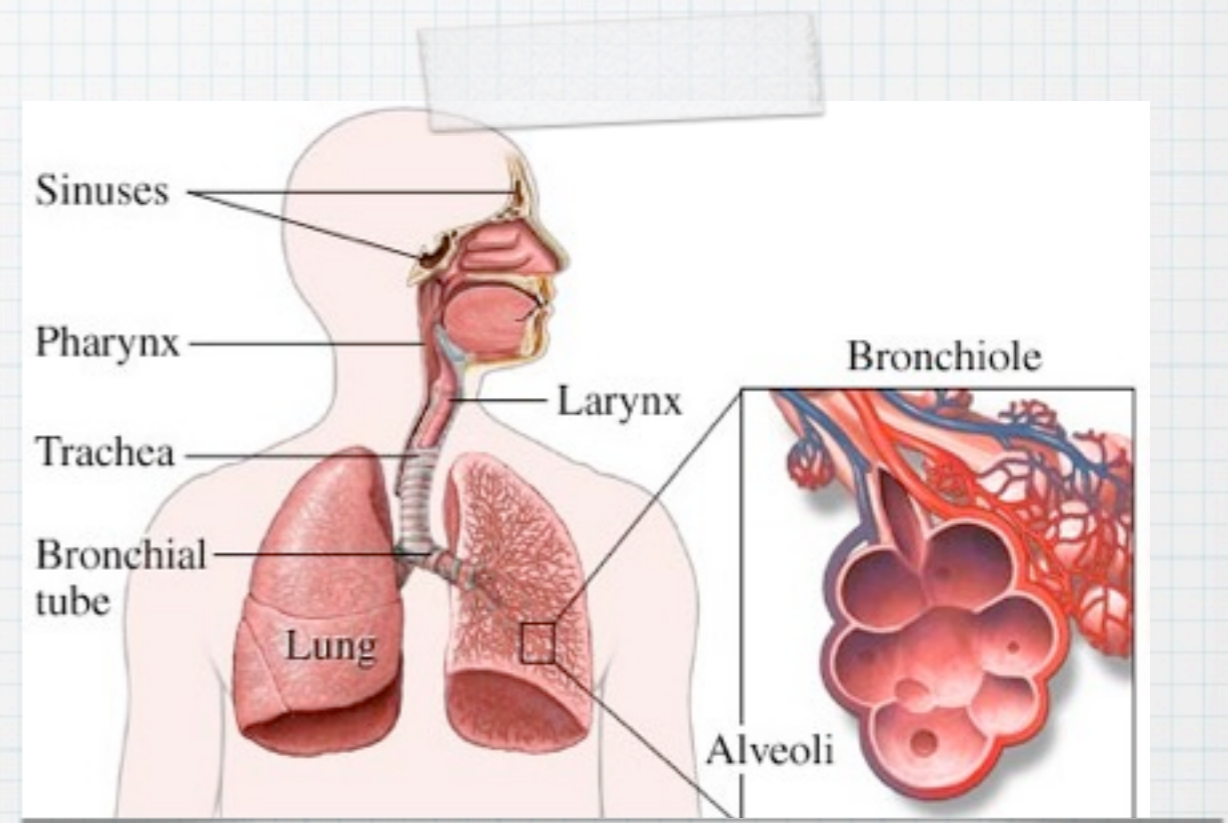
- \* Circulatory System
- \* Transports nutrients, oxygen, ect.





# Organ Systems

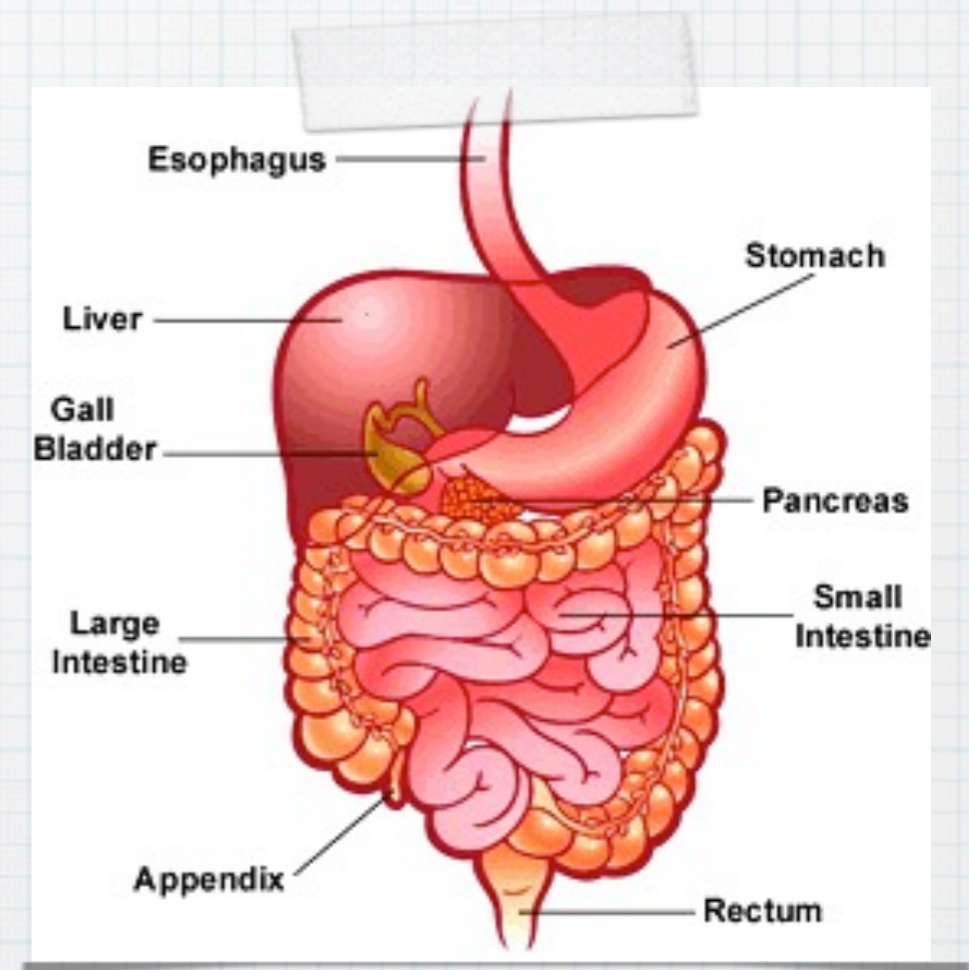
- \* Respiratory System
- \* Acquires oxygen, rids carbon dioxide.





# Organ Systems

- \* Digestive System
- \* Allow the the digestion and absorption of food.



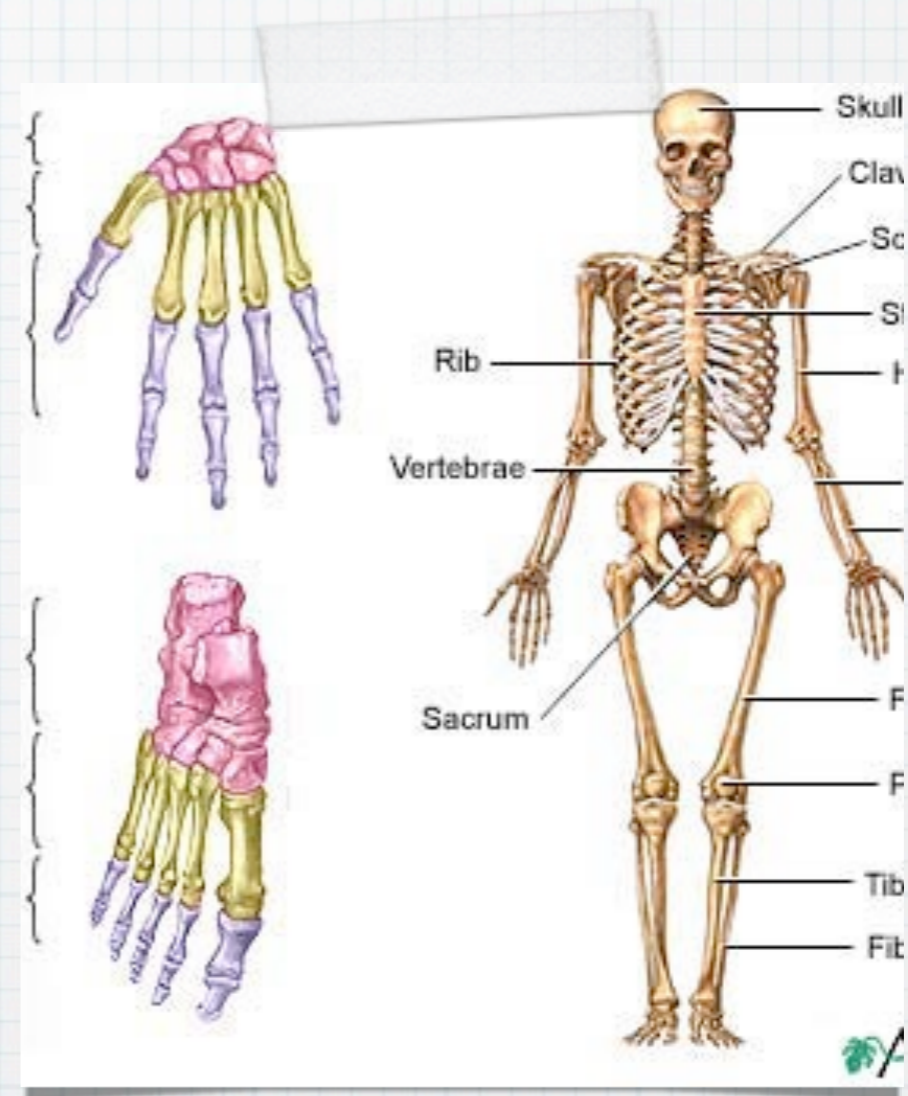


# Organ Systems That Support and Move the Body



# Organ Systems

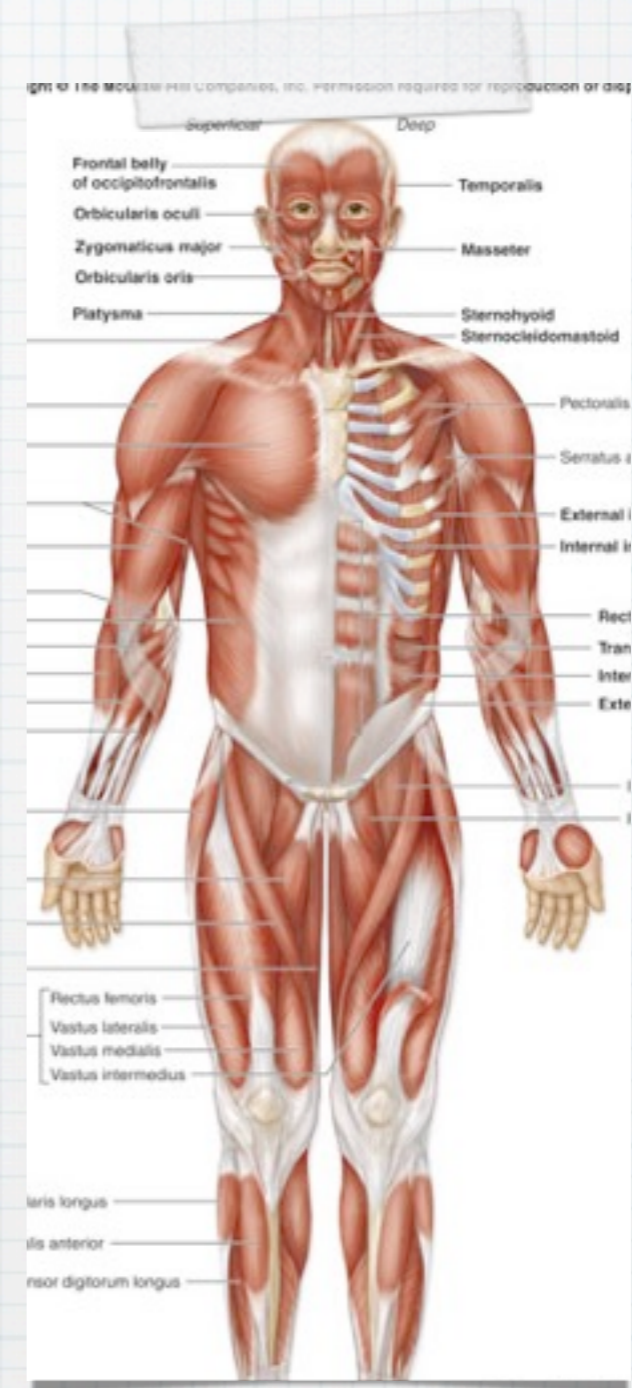
- \* Skeletal System
- \* Bones and cartilage that support and protect.





# Organ Systems

- \* Muscular System
- \* Includes muscles that contract for movement.





# Organ Systems That Protect the Body



# Organ Systems

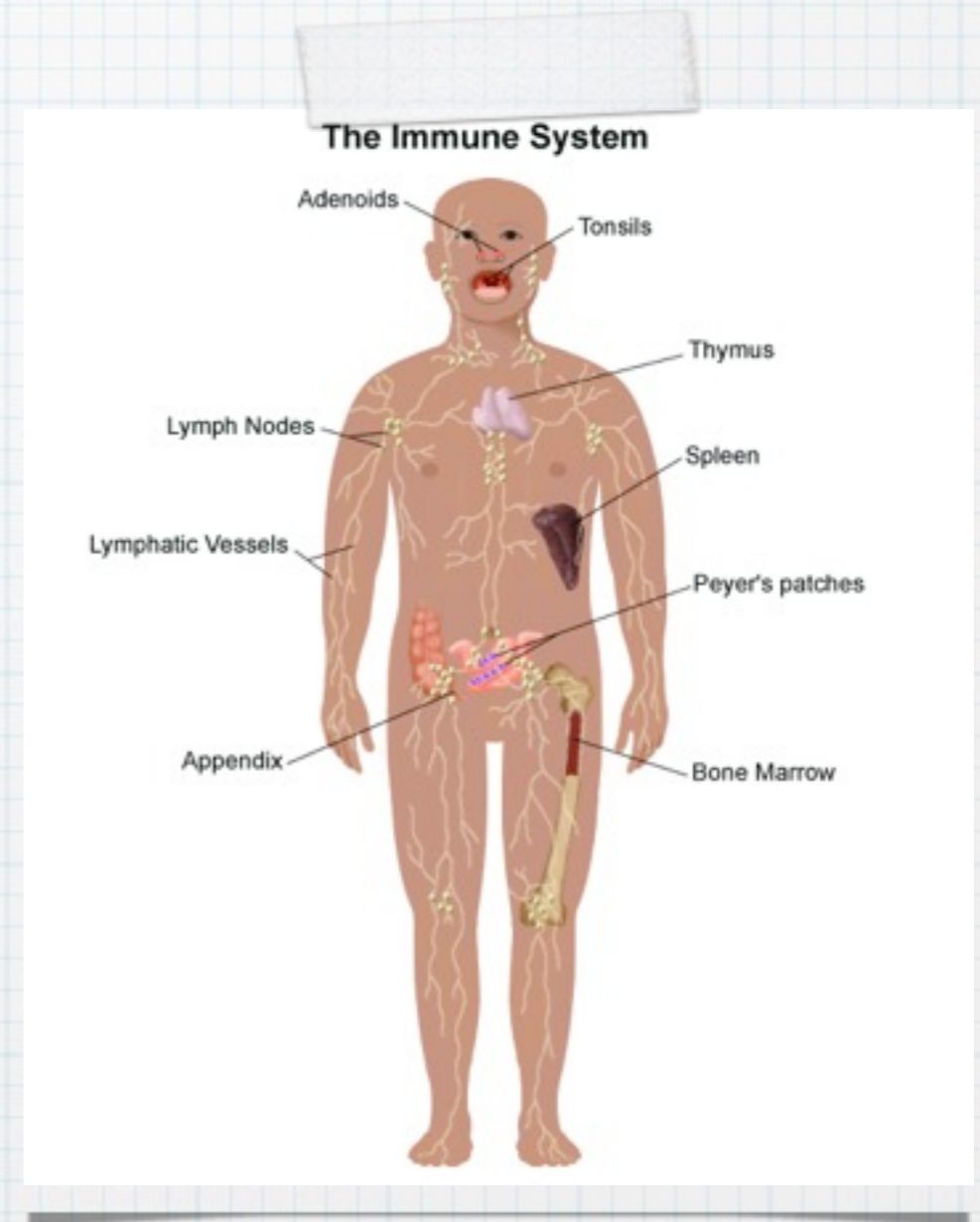
- \* Integumentary System
- \* Include skin and hair.





# Organ Systems

- \* Lymphatic/Immune System
- \* Includes lymph nodes, involved in the first line of defense.



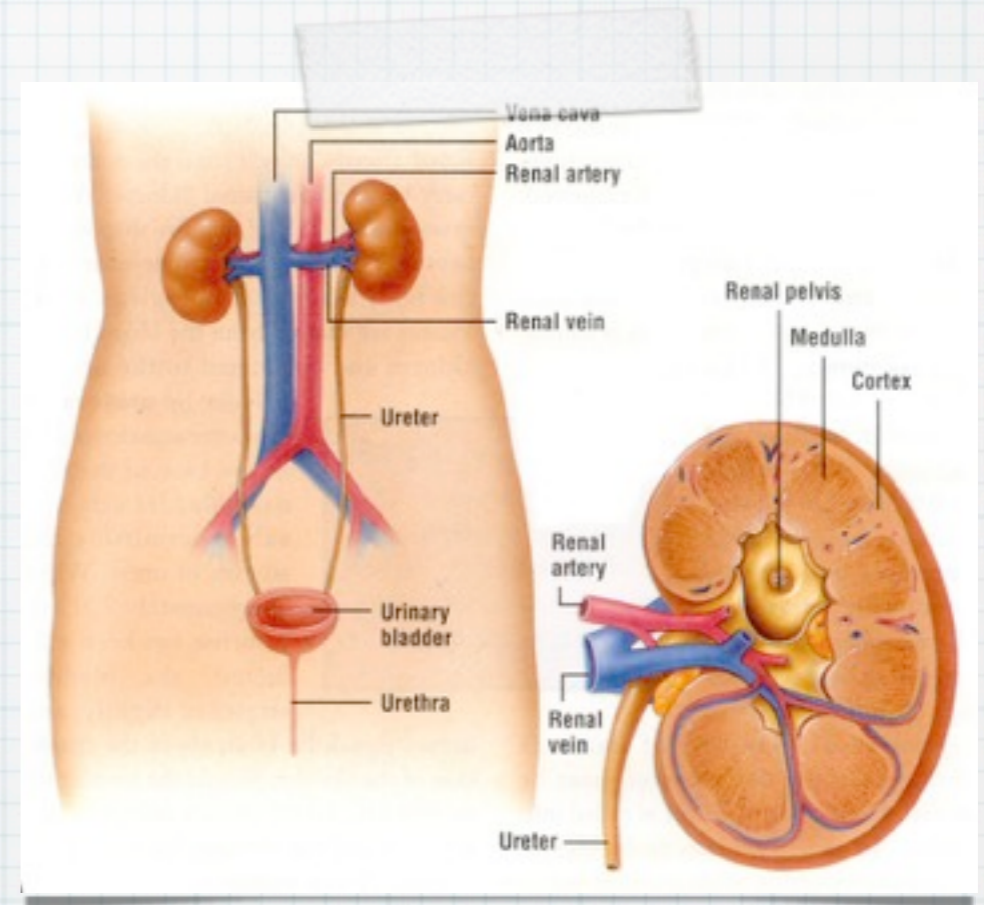


# Organ Systems That Rid Waste



# Organ Systems

- \* Excretory System
- \* Filter out waste and creates urine.



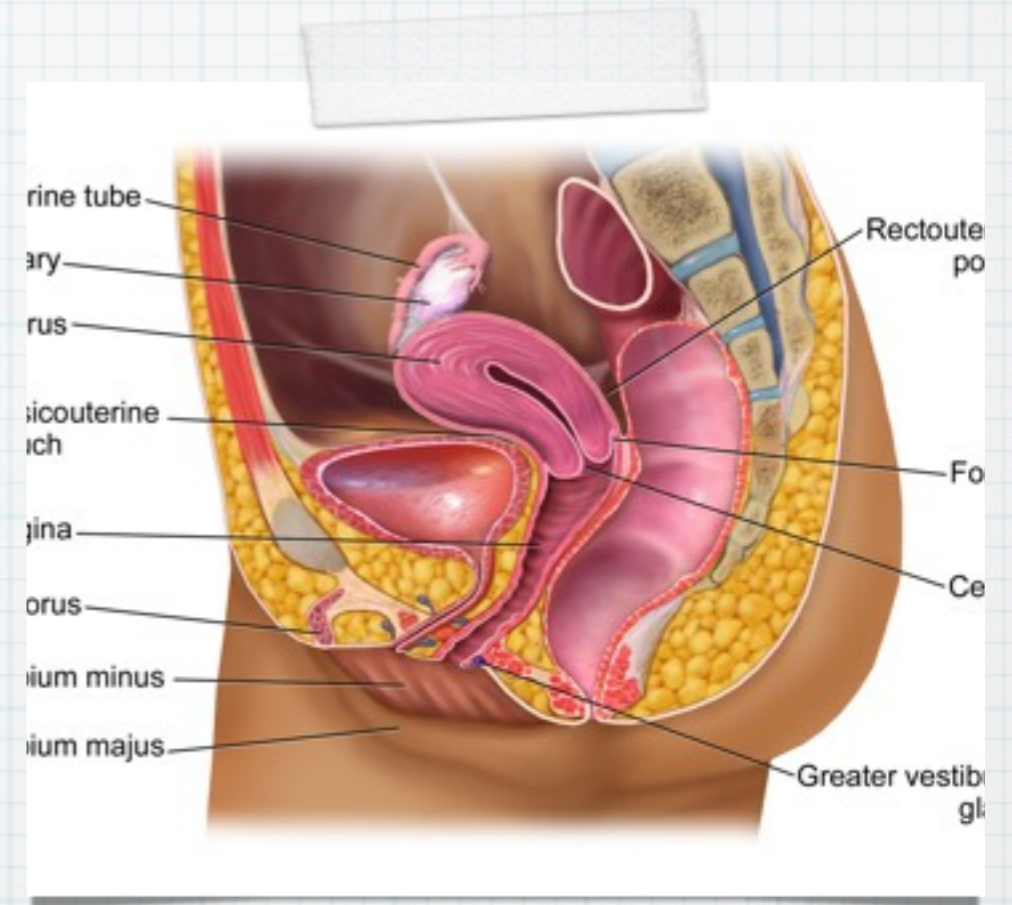


# Organ Systems That Allow for the Next Generation



# Organ Systems

- \* Reproductive System
- \* Different for male and female.





# Homeostasis

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- \* The functioning of the human body can be compared to a complex machine.
- \* Like any machine, it is made up of a number of systems that all work together to enable the machine to function properly.
- \* The activities of one system depend on the activities of every other system. If one of the systems malfunctions, other systems are also likely to suffer.



- \* We refer to the properly functioning human as being healthy or physically fit.
- \* Good physical health means not only being without disease or disability but also being able to participate fully in a variety of physical activities.
- \* For most people, lifestyle choices - **DIET** and **PHYSICAL ACTIVITY** will determine our level of physical fitness.



- \* A basic characteristic of all living organisms, not just humans, is their ability to respond to changes in their internal and external environments.
- \* The internal environment includes everything inside an an organism's body, and the external environment includes everything outside of the body.



- \* The body is able to detect changes because, under normal conditions, it maintains a healthy balance of all chemical reactions - a condition called **HOMEOSTASIS**.



- \* The word homeostasis is derived from 2 Greek words meaning **SAME STANDING**.
- \* When a change in the environment upsets this state of balance, the body senses the change and responds by trying to reestablish the balance.
- \* This system of active balance required constant monitoring and feedback about body conditions. Homeostasis often uses **NEGATIVE FEEDBACK** to control body levels.



<b>Homeostatic Component</b>	<b>Normal Range</b>	<b>Unit</b>	<b>Diagnosis (abnormal levels)</b>
<b>Body Temperature</b>	<b>36.2 - 37.3</b>	<b>Degrees Celsius</b>	<b>Fever Hypothermia</b>
<b>Blood pH</b>	<b>7.35-7.45</b>	<b>pH</b>	<b>Acidosis (low pH) Alkalosis (high pH)</b>
<b>Resting heart rate</b>	<b>50 - 100</b>	<b>Beats per minute</b>	<b>tachycardia (fast) bradycardia (slow)</b>
<b>Resting breathing rate</b>	<b>16 - 20</b>	<b>Breaths per minute</b>	<b>hyperventilation hypoventilation</b>