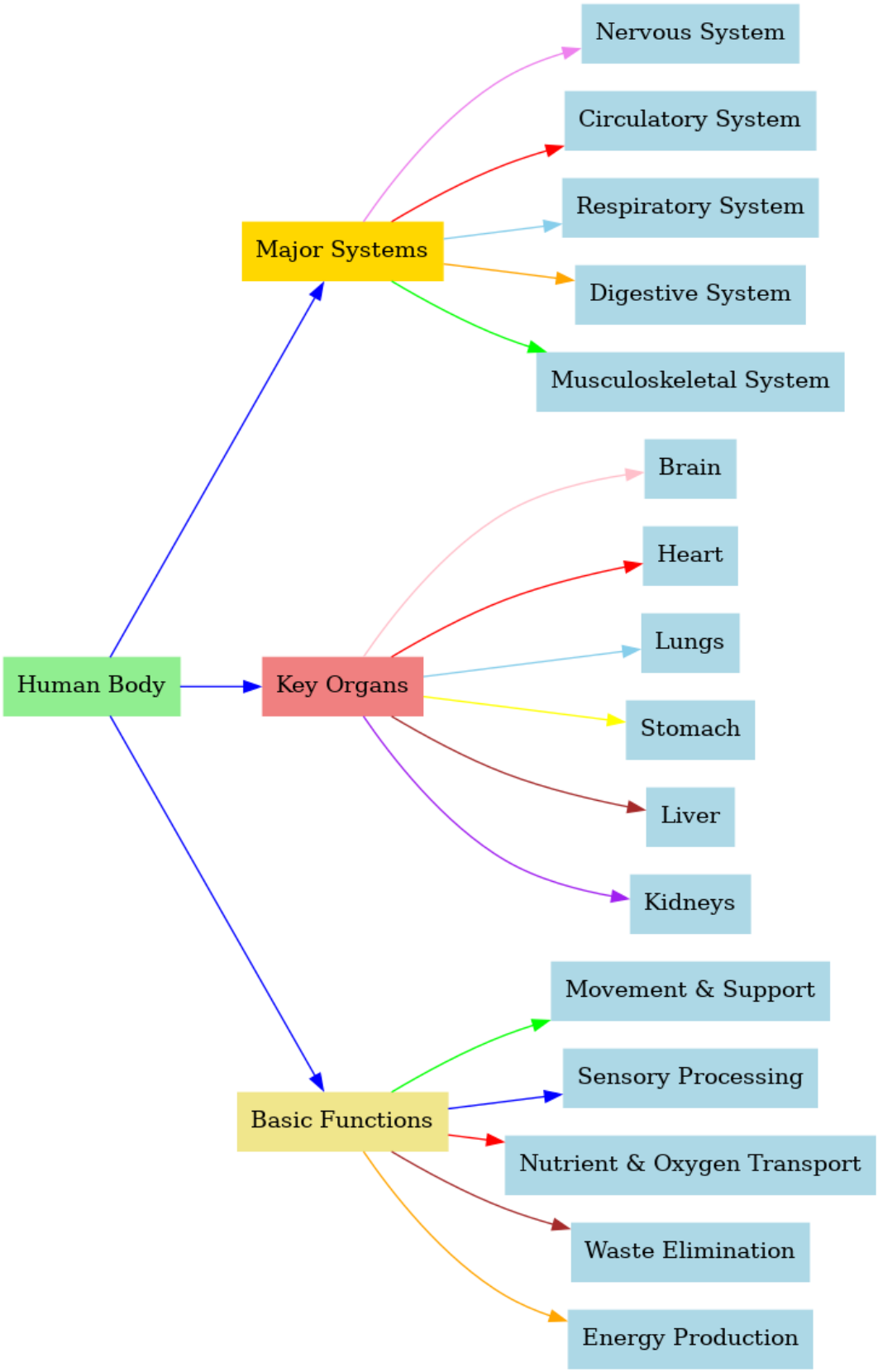
Introduction to Human Body



Definition & Scope of Anatomy and Physiology

Anatomy: Definition and Scope

- Anatomy is the study of the structure and organization of living organisms, particularly focusing on the physical makeup of the human body.

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- It involves examining the body's various parts, including bones, muscles, organs, blood vessels, nerves, and tissues.

Anatomy is further divided into several branches:

1. **Gross anatomy (macroscopic anatomy):**
   - Studies the structures visible to the naked eye, such as organs and organ systems.
2. **Microscopic anatomy:**
   - Examines structures that can only be observed under a microscope, including cells and tissues.
   - Histology and cytology are sub-disciplines within microscopic anatomy.
3. **Developmental anatomy:**
   - Investigates the changes in an organism's structure from conception to adulthood, including embryology, which focuses on the development of an organism from fertilization to birth.
4. **Comparative anatomy:**
   - Analyses and compares the anatomical structures of different species, providing insight into evolutionary relationships and adaptations.

Physiology: Definition and Scope

- Physiology is the study of the functions and processes of living organisms, with a particular focus on how the human body's various systems work together to maintain homeostasis.
- Physiology examines the mechanisms behind the body's functions at the molecular, cellular, tissue, organ, and system levels.

The field is divided into several branches, including:

1. **Cell physiology:**
   - Investigates the processes and functions of cells and their components.
2. **Systems physiology:**
   - Explores the function and interaction of specific organ systems, such as the cardiovascular, respiratory, and nervous systems.
3. **Neurophysiology:**
   - Examines the functions and mechanisms of the nervous system, including the brain, spinal cord, and peripheral nerves.
4. **Endocrinology:**
   - Studies the production, secretion, and action of hormones and their role in regulating the body's functions.

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5. Exercise physiology:

- Focuses on the effects of physical activity on the body and its systems, including adaptations and performance optimization.

Basic Anatomical Terminology

- Basic anatomical terminology is essential for accurate and effective communication in the fields of anatomy, physiology, and medicine.
- These terms provide a **standardized way** to describe the **location, orientation, and relationships** of body structures.

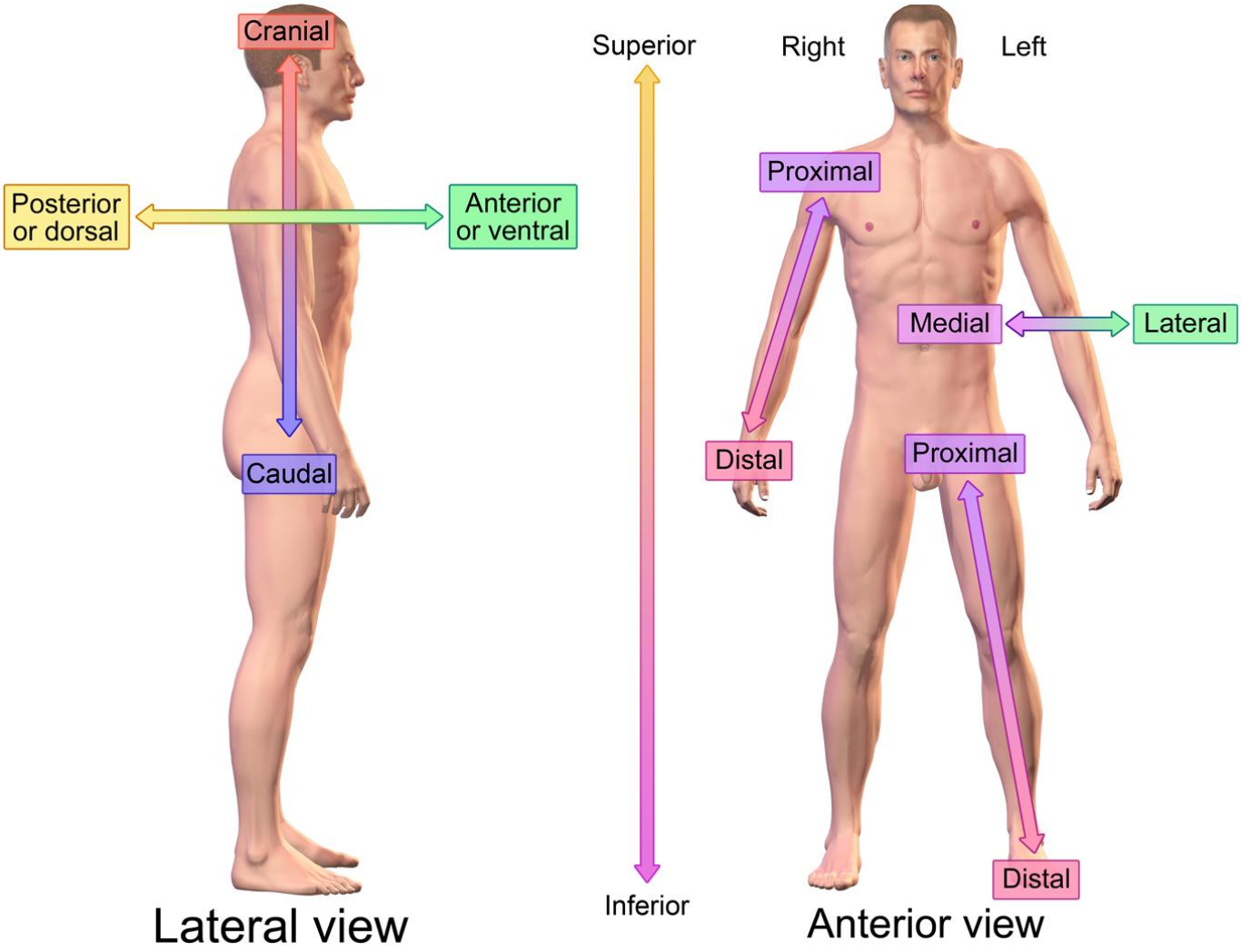
Some fundamental anatomical terms include:

1. Anatomical Position:

- A reference point for describing the location and orientation of body structures.
- The anatomical position involves the individual standing upright, facing forward, with arms at the sides, palms facing forward, and feet parallel.

2. Directional Terms:

- These terms describe the relative position of body structures in relation to each other:



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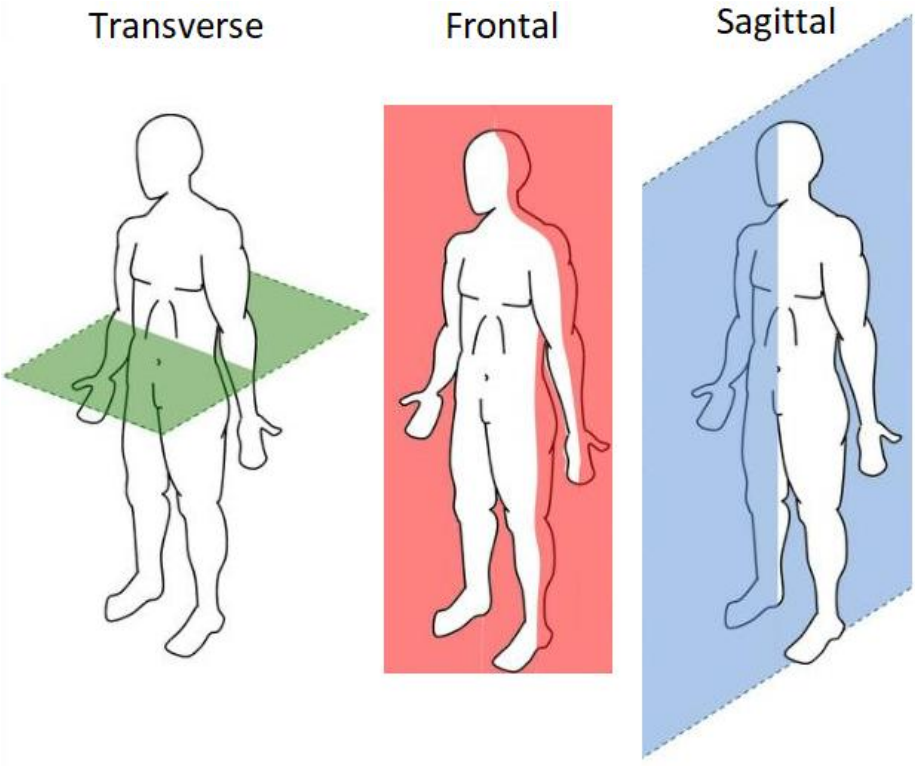
- **Anterior (Ventral)**: Toward the front of the body.
- **Posterior (Dorsal)**: Toward the back of the body.
- **Superior (Cranial)**: Closer to the head or higher than another structure.
- **Inferior (Caudal)**: Closer to the feet or lower than another structure.
- **Medial**: Nearer to the midline of the body.
- **Lateral**: Farther from the midline of the body.
- **Proximal**: Closer to the point of attachment or origin, typically used for limbs.
- **Distal**: Farther from the point of attachment or origin, typically used for limbs.
- **Superficial**: Closer to the surface of the body.
- **Deep**: Farther from the surface of the body.

3. Body Planes:

- Imaginary flat surfaces that divide the body or organs into sections:
  - **Sagittal Plane**: A vertical plane that divides the body into left and right sections.
    - **Midsagittal (Median) Plane**: Specifically divides the body into equal left and right halves.
  - **Coronal (Frontal) Plane**: A vertical plane that divides the body into anterior and posterior (front and back) sections.
  - **Transverse (Horizontal) Plane**: A horizontal plane that divides the body into superior and inferior (top and bottom) sections.



4. Body Cavities:

- Spaces within the body that house and protect internal organs:

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