

## **BMS101 Lecture Notes**

**Week 1: The cell and tissues**

**Week 2: Body Tissues**

**Week 3: Skeletal and muscular systems**

**Week 4: respiratory system**

**Week 5: Cardiovascular system**

**Week 6: Urinary system**

**Week 7: reproductive system**

**Week 8: Nervous system**

**Week 9: Integument and digestive system**

**Week 10: Human evolution**

**Week 11: Ageing & death and Endocrine system**

**Week 12: Lymphatic system**

# BMS101 Week One Summary

**Anatomy:** the study of structure

**Physiology:** the study of function

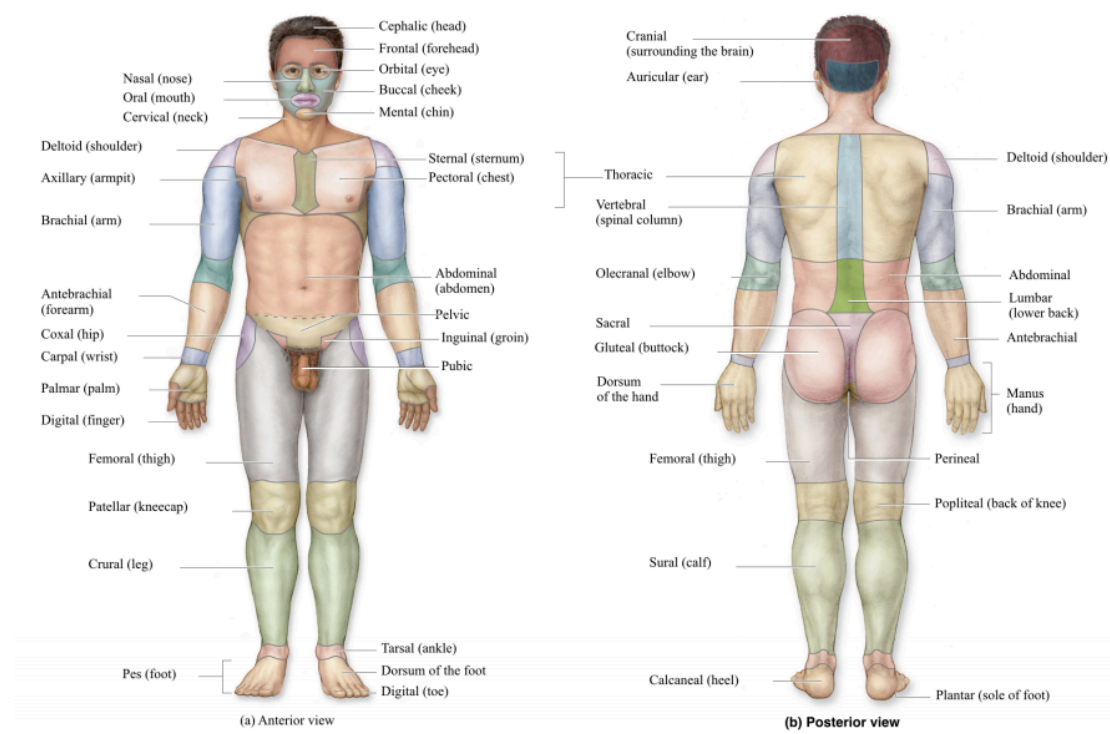
## The anatomic position:

- Standing upright
- Feet parallel on the floor
- Head level and looking forward
- Arms at side of body
- Palms facing forward and thumbs pointing away from body

## Anatomic planes:

- **Coronal:** divides the body into anterior and posterior
- **Transverse:** divides the body into superior and inferior
- **Midsagittal:** divides the body into equal left and right halves

## Anatomical names:



## Regional Anatomy:

- **Axial:** head, neck and trunk
- **Appendicular:** upper and lower limbs

## Sizes of anatomy:

- **Microscopic:** structures too small to be seen with the unaided eye, e.g. cytology and histology
- **Gross:** structures that can be seen with the unaided eye, examples:
  - **Comparative anatomy:** examines similarities and differences in anatomy of species

- **Developmental anatomy:** study of structure changes within an individual from conception through maturity
- **Embryology:** study of developmental changes occurring prior to birth
- **Regional anatomy:** study of structures within a single region
- **Surface anatomy:** study of internal structures as their locations relate to regions of skin or other surface markings
- **Systemic anatomy:** study of structures involved with a specific activity
- **Pathological anatomy:** examines changes resulting from disease
- **Radiographic anatomy:** relationships among internal structures that may be visualised by specific scanning procedures
- **Surgical anatomy:** investigates the anatomical landmarks used before and after surgery

#### **Organ systems:**

- Respiratory
- Urinary
- Nervous
- Muscular
- Reproductive
- Skeletal
- Lymphatic
- Integumentary
- Digestive
- Endocrine
- Cardiovascular

#### **Body cavities:**

- **Dorsal cavities:**
  - **Cranial:** formed by skull bones
  - **Vertebral:** formed by vertebral column bones
- **Ventral cavities:**
  - **Thoracic:** the superior cavity
  - **Abdominopelvic:** the inferior cavity

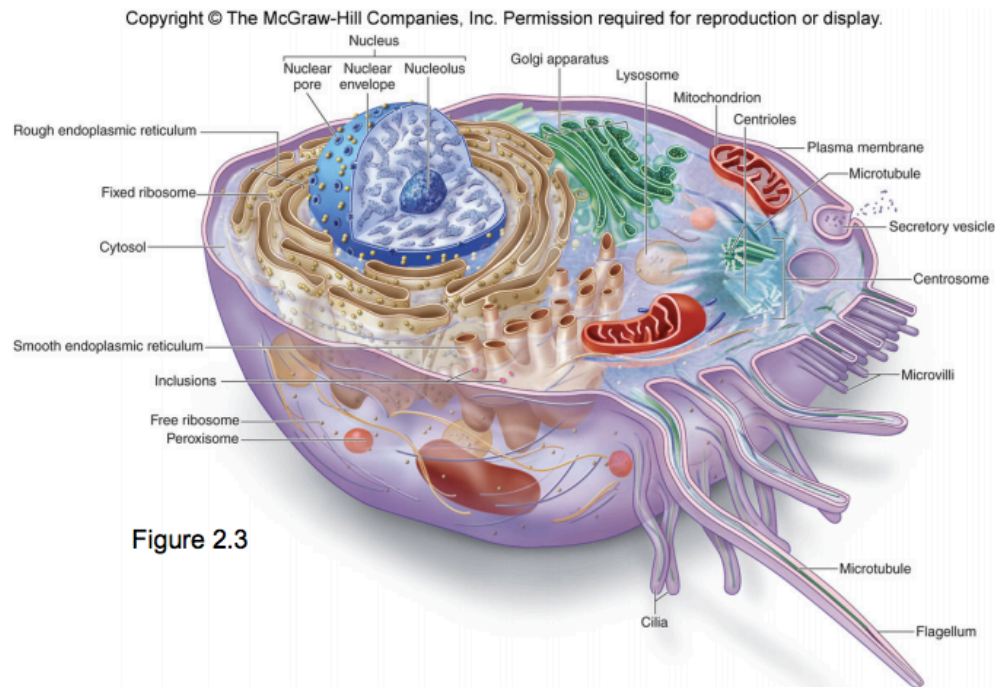
**Cellular functions:** covering, lining, storage, movement, connection, defence, communication and reproduction

#### **Prototypical cell has 3 basic parts:**

1. **Plasma membrane:** limits the outside of the cell and interacts with the environment through secretion and absorption
2. **Cytoplasm:** surrounds the nucleus and carries out the main functions using specific organelles
3. **Nucleus:** contains genetic information

#### **Plasma membrane:**

- Extremely thin outer border on cell
- Selective physical and chemical barrier deciding what goes in and out of cell
- Have two molecular components: lipids and proteins
- Made up of phospholipids which each have a polar hydrophilic head and a non-polar hydrophobic tail



### Functions of membranes:

- **Communication:** contains receptors that recognise and respond to molecular signals
- **Intercellular connection:** establishes a flexible boundary, protects cellular contents and supports cell structure
- **Physical barrier:** phospholipid bilayer separates substances inside and outside of cell
- **Selective permeability:** regulates entry and exit of ions, nutrients and waste molecules through the membrane

### Types of membrane proteins:

1. **Integral:** go all the way through the membrane
2. **Peripheral:** only on one side

**Cytoplasm:** all materials between plasma membrane and nucleus; includes cytosol, inclusions and organelles

**Cytosol:** a viscous fluid containing many different dissolved substances such as ions, nutrients, proteins, carbohydrates and amino acids

**Inclusions:** large storage aggregates of complex molecules found in the cytosol, e.g. melanin and glycogen

### Rough endoplasmic reticulum:

- Rough due to the attachment of ribosomes
- Functions to synthesise, transport or store proteins for secretion by the cell, incorporation into the plasma membrane and creation of lysosomes

### Smooth endoplasmic reticulum:

- No ribosomes so walls have a smooth appearance
- Synthesis, transport and storage of lipids
- Metabolism of carbohydrates
- Detoxification of drugs, alcohol and poisons

### Golgi apparatus:

- Function to receive proteins and lipids from the RER for modification, sorting and packaging