



COURSE NAME: HUMAN ANATOMY & PHYSIOLOGY

(BP301 T)

YEAR : I SEM/I YEAR

TOPIC 2 : LEVEL OF STRUCTURAL ORGANISATION



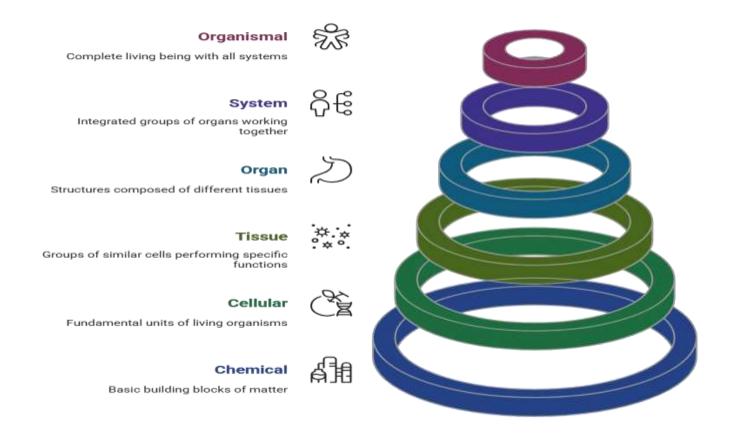
DESIGN THINKING IN STRUCTURAL ORGANIZATION

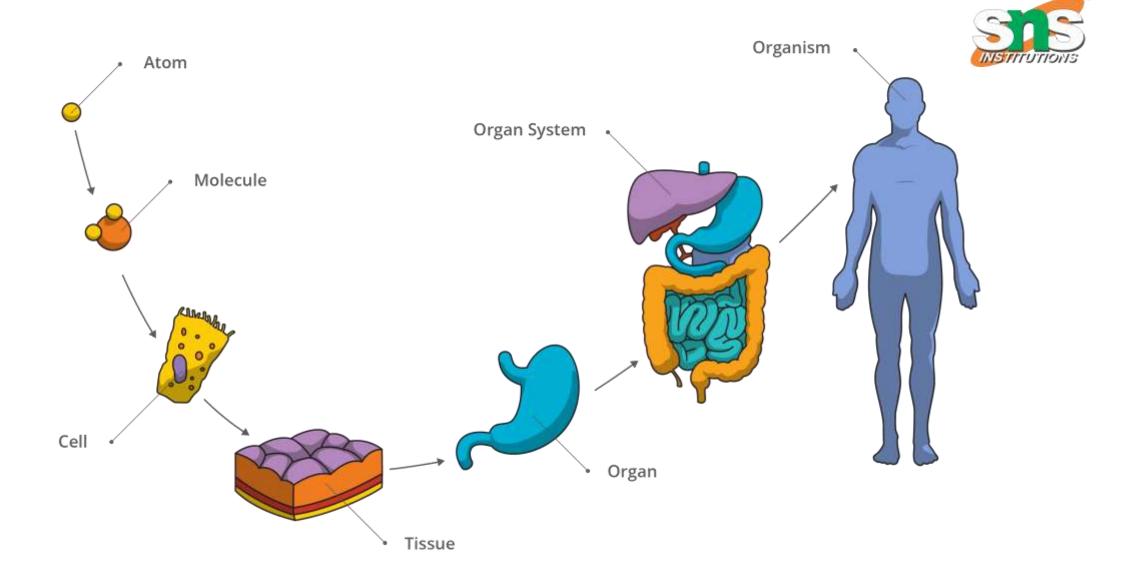
- ✓ Empathize: Deeply understand learner's challenges, needs, and experiences in studying anatomy. Engage with students, educators to uncover pain points and preferences.
- ✓ **Define:** Reframe the problem based on insights, establish clear context. Synthesize data to pinpoint core issues, like defining the need for intuitive understanding of body levels.
- ✓ **Ideate:** Brainstorm and explore a wide range of ideas and potential solutions, including innovative teaching methods or visualizations.
- ✓ **Prototype:** Simulate and build models to enhance comprehension and engagement.



MIND MAP

Structural Organization Hierarchy

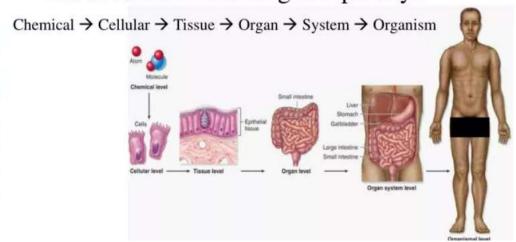






INTRODUCTION

- Levels of Organization
 - The structures of the human body are organized into levels of increasing complexity.





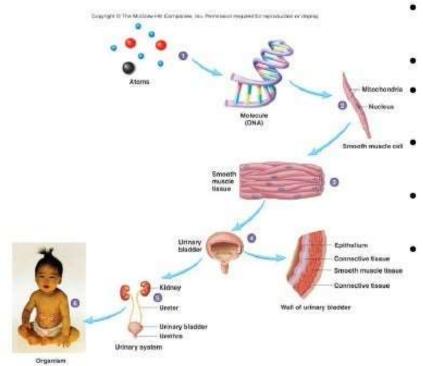
TERMINOLOGY USED IN STRUCTURAL ORGANIZATION

Key Terms:

- ✓ Homeostasis: Maintenance of internal balance.
- ✓ Hierarchy: Levels from chemical to organismal.
- ✓ Anatomy: Structure; Physiology: Function.
- ✓ Integration: How levels interact for survival.

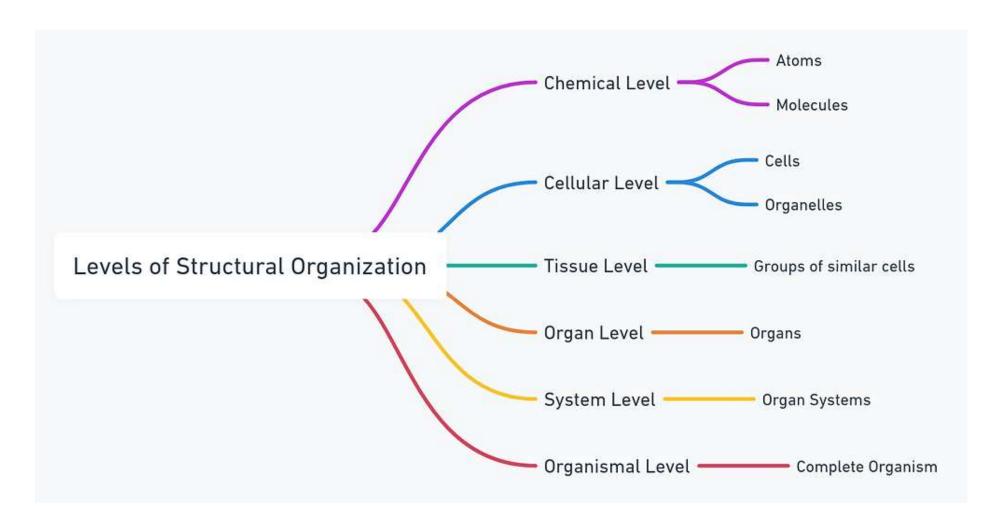


Levels of Structural Organization



- Chemical Level: interaction of atoms
- Cell Level: functional unit of life
 - Tissue Level: group of similar cells and the materials surrounding them
 - Organ Level: one or more tissues functioning together
- Organ System Level: group of organs functioning together
- Organism Level: any living thing.









Essential Molecules of Life

Water

Vital for physiological processes and hydration.







Primary source of energy for the body.

Carbohydrates



Carry genetic information and aid in protein synthesis.



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Serve structural, enzymatic, and regulatory roles.

Proteins



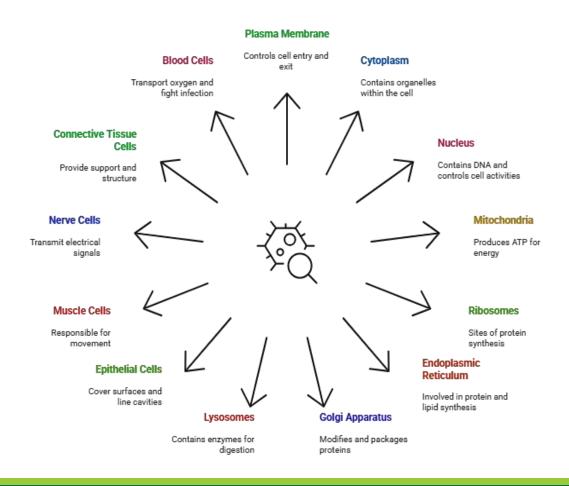
Lipids

Important for energy storage and insulation.



CELLULAR LEVEL

Cell Structure and Types





TISSUE LEVEL

Foundations of Human Tissue



Covers surfaces and forms glands, providing protection and secretion.

Epithelial

Tissue



Connective Tissue

Supports and connects tissues, characterized by an extracellular matrix.



Muscle Tissue

Responsible for movement, including skeletal, smooth, and cardiac types.

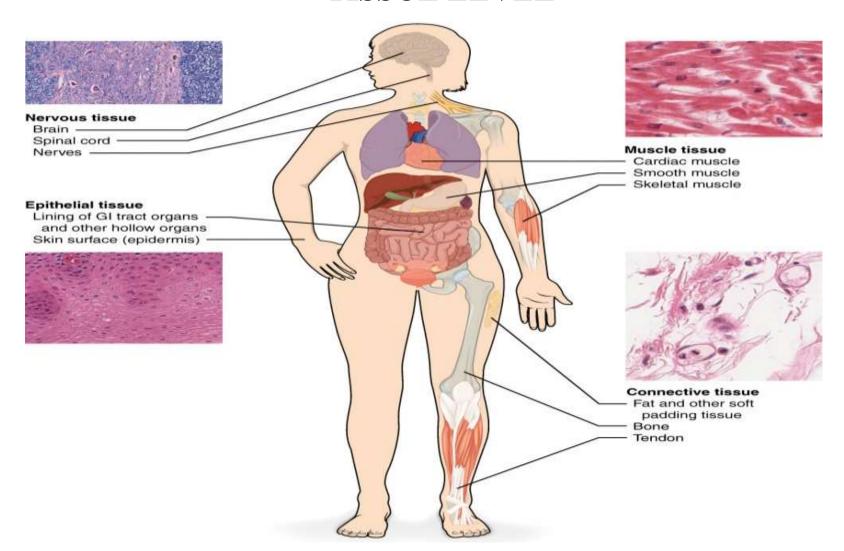


Nervous Tissue

Conducts electrical signals, transmitting information through neurons.



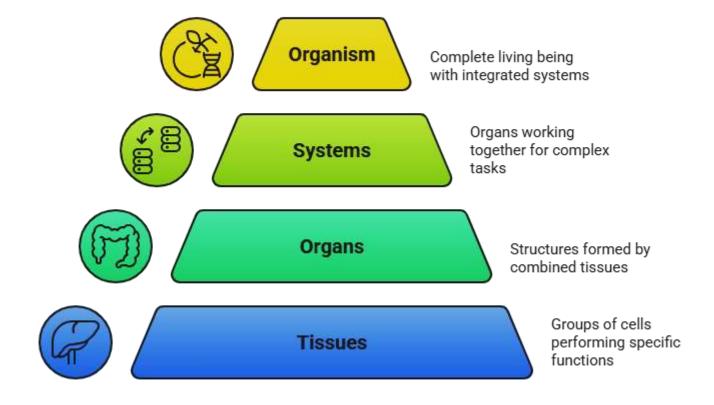
TISSUE LEVEL



ORGAN LEVEL



Biological Hierarchy of Organs





SYSTEM LEVEL

Human Organ Systems

Integumentary System

Protects the body and regulates temperature

Muscular System

Enables movement and generates heat

Endocrine System

Regulates bodily functions through hormones

Lymphatic System

Returns fluids and provides immunity

Digestive System

Breaks down food and absorbs nutrients

Reproductive System

Enables reproduction



Skeletal System

Provides support and enables movement

Nervous System

Controls and coordinates bodily functions

Cardiovascular System

Transports blood and nutrients

Respiratory System

Facilitates gas exchange

Urinary System

Filters blood and eliminates waste



ORGANISMAL LEVEL

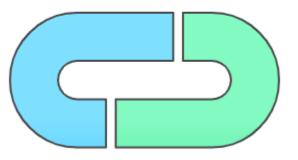




Maintaining Life's Balance

Interdependence of Systems

The interconnectedness of organ systems for proper function



Homeostasis

The process of maintaining a stable internal environment



SUMMARY

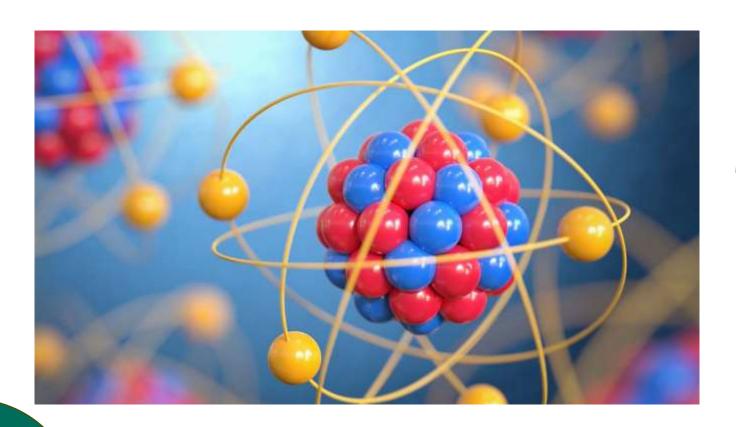
- ✓ Understanding these levels of structural organization is fundamental to understanding human anatomy and physiology. It provides a framework for comprehending how the body is built and how it functions, both in health and in disease.
- ✓ Disruptions at any level can have cascading effects on other levels, ultimately impacting the overall health and well-being of the organism.



CLASS ASSESSMENTS



Identify the level of organization shown in the picture $\widehat{\ }$





- A. Organ
- B. Tissue
- C. Chemical
- D. Organism



REFERENCE

- ✓ Essentials of Medical Physiology, K. Sembulingam & P. Sembulingam (Jaypee Brothers Medical Publishers)
- ✓ A Textbook of Human Anatomy and Physiology-I, SIA Publishers
- ✓ Human Anatomy & PhysiologyGerard J. Tortora & Bryan H. Derrickson (Wiley)
- ✓ Ross and wilson anatomy and physiology in health and illness, Anne Waugh &Allison Grant.



