AAMC

| Medical College Admission Test

Biological and Biochemical Foundations of Living Systems Section

What this Section Tests

Applicants must be prepared to learn in medical school about the biological and biochemical concepts that contribute to health and disease. This section tests applicants' academic preparation in biology, biochemistry, general chemistry, and organic chemistry that provide the building blocks for learning in medical school about how:

- the major biochemical, genetic, and molecular functions of the cell support health and lead to disease;
- cells grow and integrate to form tissues and organs that carry out essential biochemical and physiological functions; and
- the body responds to internal and external stimuli to support homeostasis and the ability to reproduce.

This section most closely aligns with the Biological Sciences section of the old MCAT exam.

Foundational Concept 1

Biomolecules have unique properties that determine how they contribute to the structure and function of cells and how they participate in the processes necessary to sustain life.

Content Categories

- Structure and function of proteins and their constituent amino acids
- Transmission of genetic information from the gene to the protein
- Transmission of heritable information from generation to generation and the processes that increase generic diversity
- Principles of bioenergetics and fuel molecule metabolism

Foundational Concept 2

Highly organized assemblies of molecules, cells, and organs interact to carry out the function of living organisms.

Content Categories

- Assemblies of molecules, cells, and groups of cells within singular cellular and multicellular organisms
- The structure, growth, physiology, and genetics of prokaryotes and viruses
- Processes of cell division, differentiation, and specialization

Foundational Concept 3

Complex systems of tissues and organs sense the internal and external environments of multicellular organisms, and through integrated functioning, maintain a stable internal environment within an ever-changing external environment.

Content Categories

- Structure and functions of the nervous and endocrine systems and ways in which the systems coordinate the organ systems
- Structure and integrative functions of the main organ systems

Examples of ways examinees are asked to combine their knowledge of the foundational concepts listed above and their scientific inquiry and reasoning skills to answer test questions:

- Recalling the structural characteristics of two tissues and relating them to one another
- Applying an understanding of Le Châtelier's Principle to explain differences in deprotonation of organic acids when added to blood versus pure water
- Using knowledge of adaptive immune response to evaluate the acceptability of a treatment for use in a clinical context
- Forming a hypothesis about the effect of the pineal gland on thermogenesis based on the data from an experiment investigating the interaction of temperature and pineal gland activity on body and organ weights for hamsters under different experimental conditions
- Using data about wavelength and light absorption to determine the color perception of an individual with a given phenotype

Foundational Concepts, or big ideas in sciences, lay the foundation for learning in medical school. This section of the exam is organized around 3 foundational concepts.

Content Categories are the topics and subtopics students need to know in order to demonstrate their understanding of the foundational concepts

Examinees are asked to combine their knowledge of the foundational concepts with four scientific inquiry and reasoning skills to solve problems.

- Reasoning with scientific principles, theories, and models
- Evaluating scientific explanations and principles
- Demonstrating understanding of important concepts in scientific research
- Interpreting patterns in data presented in tables, figures, and graphs