

CELL AND MOLECULAR BIOLOGY

The Discovery of Cells

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The Discovery of Cells

Robert Hooke's drawing of a thin slice of cork, he saw the honeycomb-like and repeating box structures of "cells" under early microscope



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The Discovery of Cells

- The discovery followed by Single-lens microscope used by Anton van Leeuwenhoek to observe bacteria and other microorganisms.
- The biconvex lens, which was capable of magnifying an object approximately 270 times.



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The Cell Theory

- When Schleiden and Schwann proposed the **Cell Theory** in 1838.
- The cell theory states that:

1. All life forms are made of one or more cells.
2. Cells only arise from pre-existing cells.
3. The cell is the smallest form of life.



What is a cell ?

- Cell is chemical system that is able to maintain its structure, function and reproduce
- Cell is a unit of life
- All living things composed of cells
- Each cell able to do its specific functions based on properties of organelles in its compartment
- Group of cells organised, specialised and functions as multicellular organisms



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Discussions:

List the basic properties of the cells?



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Basic Properties of Cells

1. Cells Are Highly Complex and Organized

- order and consistency
- cellular activities can be precise
- Example: an epithelial cells that line the intestine are tightly connected to each other like bricks in a wall



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Basic Properties of Cells

2. Cells Possess a Genetic Program

- Organisms are built according to information encoded by genes.
- This huge amount of information is packaged into a set of chromosomes located in a cell nucleus.



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Basic Properties of Cells

3. Cells are capable of producing more of themselves

- Cells reproduce by division, a process in which the contents of a “mother” cell are distributed into two “daughter” cells.



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Basic Properties of Cells

4. Cells Acquire and Utilize Energy

– Catabolism and anabolism activities



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Basic Properties of Cells

5. Cells Carry Out a Variety of Chemical Reactions

- Act like a chemical plants - the simplest bacterial cell is capable of hundreds of different chemical transformations.
- Virtually all chemical changes that take place in cells require *enzymes—molecules* that greatly increase the rate at which a chemical reaction occurs.



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Basic Properties of Cells

6. Cells Engage in Mechanical Activities

- Materials are transported from place to place, structures are assembled and then rapidly disassembled, and, in many cases, the entire cell moves itself from one site to another.
- Motor proteins



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Basic Properties of Cells

7. Cells Are Able to Respond to Stimuli

- Most cells are covered with *receptors that interact with substances in the environment* in highly specific ways.
- Cells may respond to specific stimuli by altering their metabolic activities, moving from one place to another, or even committing suicide.



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Basic Properties of Cells

8. Cells Are Capable of Self-Regulation



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