

Biology 124

Complete

Student**Summaries** 

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INTRODUCTION

Chapter 1 & 25 *Definitions*

CELL *Organized chemical system that includes many specialized molecules, surrounded by a membrane.*

EMERGENT PROPERTIES *Characteristics that depend on the level of organization of matter, but do not exist on lower levels of organization.*

LIFE *Emergent property of the organization of matter into cells.*

UNICELLULAR *Organisms that exist as a single cell e.g. bacteria, protozoans.*

MULTICELLULAR *Tightly coordinated groups of cells that are interdependent (cannot survive on their own).*

POPULATION *Group of organisms of the same place that live in together in the same area.*

SPECIES *Group of populations where individuals are similar structure, biochemistry and behaviour that they can successfully inbreed.*

COMMUNITY *All the populations of different species that live in the same place.*

ECOSYSTEM *Interaction between the community and the abiotic factors in a specific place (habitat).*

BIOSPHERE *All ecosystems of the world, working together to sustain life.*

DNA (Deoxyribonucleic acid) *Large, double stranded helical molecule that contains the information to create a living organism from molecules.*

METABOLISM *Ability of a cell or organism to extract energy from its surroundings and use it to grow, maintain and reproduce.*

PHOTOSYNTHESIS *Electromagnetic energy (sunlight) is absorbed and converted into chemical energy (in starch and sugar molecules) to manufacture other necessary molecules.*

CELLULAR RESPIRATION *Complex molecules are broken down with oxygen to release their energy for cellular activities.*

PRIMARY PRODUCERS *Organisms that photosynthesize and serves as food for other organisms.*

CONSUMERS *Organisms that directly or indirectly feed on the complex molecules made by plants.*

DECOMPOSERS *Organisms, e.g. bacteria and fungi that feed on the remains of dead organisms to break down their complex molecules into simpler molecules and recycle it back into the ground.*

HOMEOSTASIS *A constant internal condition that is maintained by responses on changes in the external environment, e.g. temperature, blood chemistry, CO₂-levels.*

REPRODUCTION *Process through which parents produce offspring.*

INHERITANCE *Transmission of DNA (genetic information) from one generation to another.*

LIFE CYCLE *Sequential stages through which individuals develop, grow, maintain and reproduce.*

GENETICS *Study of heredity.*

ARTIFICIAL SELECTION *Breeding of plants and animals to produce desirable traits.*

NATURAL SELECTION *he process whereby organisms who are better adapted to their environment tend to survive and produce more offspring.*

GENES *The functional units of DNA.*

PROTIENS *Molecules in living organisms that establish structure and preform important functions.*

MUTATIONS *Random changes in the structure, number or arrangement of DNA molecules.*

ADAPTATIONS *Characteristics that help an organism survive longer in a particular environment.*

GENUS *Group of similar species that share common ancestry.*

SCIENTIFIC NAME *Part 1 – Genus; Part 2 – Particular species*

PHYLOGENETIC TREES *Illustrations of the evolutionary pathways for all organisms.*

SCIENTIFIC METHOD *Investigative approach to acquiring knowledge where scientists make observations, develop explanations and test those explanations.*

PROTOCELLS *Primitive cell like structures; have some properties of life; could be precursors of life.*

ABIOGENESIS *Study of how life arose from inorganic matter.*

BIOSIGNATURES *Organic molecules in sedimentary rocks that could only be formed by cellular activity*

MICROFOSSILS *Remains of a cell that has decayed and be filled by calcium carbonate or silica*

ENDOSYMBIOTIC THEORY – Lynn Margulis @ University of Massachusetts. Membranous organelles of eukaryotic cells (mitochondria and chloroplasts) originated from mutualistic relationships between 2 prokaryotic cells.

ENDOSYMBIONTS Organisms that live symbiotically within a host cell

ENDOCYTOSIS Process of infolding of the plasma membrane, thought to be responsible for the evolution of nucleus and other membranous structures.

NUCLEOID Central area of prokaryotic cell where chromosomes is packed into

AEROBE Require oxygen for cellular respiration.

OBLIGATE AEROBE Requires oxygen to grow.

ANAEROBE Poisoned by oxygen; requires fermentation to survive.

FACULTATIVE ANAEROBE Uses oxygen when present, but lives by fermentation in anaerobic environments.

NITROGEN FIXATION Process through what bacteria reduce atmospheric nitrogen to ammonium, which can be absorbed by plants.

NITRIFICATION Process of conversion of ammonium to nitrates.

BINARY FISSION Process where a parent cell divides into two daughter cells that are identical copies of the parent.

CONJUNCTION Process where two parent cells join and transfer chromosomes through a plasmid integrating into another cell so that genetic recombination occurs; Recombinant cell divides so that daughter cells form with genetic material different to their parent cell.

HORIZONTAL GENE TRANSFER Process of where conjunction takes place.

QUORUM SENSING Process of bacterial communication where one bacteria attaches to the surface of another and sends and receives chemical signals

EXOTOXINS Toxic proteins – secreted from bacterium / released from cell that interfere with biochemical processes of body cells

ENDOTOXINS Lipopolysaccharides released from outer membrane of cell when bacterium dies; overstimulates host's immune system which triggers inflammation.

EXOENZYMES Enzymatic proteins that digest plasma membranes and cause cells of infected host to rupture and die

INTRODUCTION TO BIOLOGICAL CONCEPTS

CHAPTER 1 & 25

1. WHAT IS LIFE

CHAPTER 1 [pages 2 - 19]

- Unbroken chain that began 3.5 Billion years ago.
- Living organisms share common characteristics that set them apart from non-living organisms.
- They must gather energy and materials to build molecules to assemble complex structures.
- Complex structures are necessary for life, e. g. to grow in size, maintain and repair body structure, procreate, react to environmental stimuli and changes therein.
- Living organisms have deoxyribonucleic acid.
- Living organisms engage in 2 main metabolic processes, photosynthesis and cellular respiration.

1.1 HIERARCHY OF LIFE

