

BIOLOGY I – Lab Review

Exercise 1 – The Microscope

Be able to identify the parts of the microscope (pg. 7)

Be able to identify the 3 objectives and give magnifications of each:

scanner objective - 4x

low power objective - 10x

high power objective - 43x

Be able to calculate total magnification:

Magnification of ocular (10x) X Magnification of objective = Total Magnification

Exercise 2 – Molecular Biology

Be able to identify models of each compound listed on page 10.

Each model will be intact. You must identify.

Exercise 3 – Metabolism

Test	Reagent used	Positive result	Negative result
1. starch	Iodine	Black or dark purple	No change
2. glucose & other reducing sugars	Benedict's solution	Green, orange, yellow	No change

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3. Protein (biuret)	Sodium hydroxide and copper sulfate	Lavender to purple	No change	P. 15
4. Protein (xanthoproteic)	Nitric acid and Ammonium hydroxide	Orange-yellow	No change	P. 15

Exercise 4 - The Cell ^{P. 37-47}

Be able to identify organelles on plant and animal cell models.

Be able to give one function of each organelle.

Nucleus - control center

Nucleolus - RNA synthesis

Chromosomes - site of genes

Mitochondria - powerhouse of the cell, ATP synthesis

ER - paired membrane

Ribosomes - protein synthesis

Golgi body - packages proteins

Lysosomes - animal only - cellular digestion

Chloroplasts - plants only - plastid - photosynthesis

Centrioles - animal only - forms spindle during mitosis

Vacuole - stores water

Know two differences between plant and animal cells:

- (1) plants have a cell wall, animal cells do not have a cell wall

http://www.dacc.edu/rose/biology_i.htm

LIPID (fat) - when rubbed on filter paper will make paper translucent

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Animal Cell - p. 41

Plant Cell - p. 43

- (2) *plants cells are rigid, animal cells are pliable*
- (3) *plants cells are usually brick shaped, animal cells can be any shape*
- (4) *plants have chloroplasts (plastids), animals do not*
- (5) *animals have lysosomes, plants do not*
- (6) *animals have centrioles, plants do not*

Exercise 5 – Mitosis P. 49

Cellular Division consists of two processes:

Mitosis - Division of the nucleus, must be equal resulting in 2 genetically identical daughter nuclei

Cytokinesis - Division of the cytoplasm, does not have to be equal

Be able to identify Interphase model and 2 characteristics:

Nuclear membrane is visible.

Nucleolus is visible.

Chromatin is present.

Metabolism is taking place.

Often called the Resting Stage.

Be able to identify each phase of mitosis by looking at models and give 2 characteristics of each.

Prophase:

- 1 *Nuclear membrane disappears.*
- 2 *Nucleolus disappears*
- 3 *Chromatin becomes chromosomes*
- 4 *Centrioles appear and migrate to opposite poles forming the spindle*

Metaphase:

http://www.dscc.edu/rose/biology_i.htm

Chromosomes align across the equatorial plane of the spindle.

Chromosomes make copies of themselves.

Anaphase:

Chromosomes pairs are pulled apart.

One set of chromosomes is pulled to each pole.

Telophase:

One set of chromosomes is at each pole.

Reverse Prophase: Nuclear membrane reappears, nucleolus reappears, chromosomes become chromatin, centrioles and spindle disappear.

* *CYTOKINESIS takes place splitting the two new daughter cells. Daughter cells are genetically identical. Two animal daughter cells pinch apart from the outside > in. Two plants cells separate by the formation of a cell plate that grows from the inside > out.*

Know two differences between plant and animal cell mitosis:

Cytokinesis - animal cells pinch apart, plant cell grow a cell plate.

Centrioles - animal cells have them, plant cells do not.

Mitosis can take place in all animal cells. Mitosis can only take place in Meristematic regions of a plant.

Exercise 6 - Animal Tissues

Be able to identify animal tissues from 2X2 slides.

Simple and stratified squamous, cuboidal, and columnar (ciliated and non-ciliated) epithelium

Loose connective - areolar (know function), adipose (fat), and blood (know 4 components)

Dense connective - tendon (function), hyaline cartilage (know drawing), and bone (drawing)

Muscle - smooth, skeletal, and cardiac (know unique characteristics of each)

Nervous - motor neuron

http://www.dacc.edu/rose/biology_i.htm

(1) root & shoot tips

(2) vascular cambium

Exercise 8 – Diversity Among Living Organisms (begins taxonomy)

Kingdom Monera – all prokaryotic, single-celled organisms, asexual reproduction

binary fission
fragmentation
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Division Schizophyta – Bacteria: shape (coccus, bacillus, and spirillum) and arrangement (diplo, strepto, and staph)

Division Cyanophyta – *Nostoc* (micro., 2X2 slide, pres.) and *Oscillatoria* (micro. & 2X2)

VIRUSES – (1) definition (2) structure (3) models

Exercise 9 – Algae and Protozoa

Kingdom Protista – all eukaryotic, single celled and multicellular, asexual & sexual reproduction, broken into Algae and Protozoa

Algae – autotrophic, adults are non-motile, divided by color

Division Chlorophyta (green algae) - Ex. *Spirogyra* micro. & 2X2 slides – isogamous

P. 101 * Ex. *Oedogonium* micro. & 2X2 slide – heterogamous P. 100 & 101

know life cycle

Division Chrysophyta (golden algae) - Ex. *Diatoms* – micro. & 2X2 slides

p. 164 Ex. *Vaucheria* – micro. & 2X2 slide – locate 1) coenocytic filament 2) antheridium (3) oogonium

Division Phaeophyta (brown algae) - Ex. *Fucus* (receptacles and conceptacles) – draw

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Ex. *Laminaria* (holdfast); blade; air bladder

Ex. *Nereocystis* (air bladder); blade;

Ex. *Sargassum*

preserved specimens

Division Rhodophyta (red algae) - Ex. *Polysiphonia* – microscope slide

Protozoa – heterotrophic, classified according to method of motility

Class Flagellate (Mastigophora) - Ex. *Euglena* (micro. & drawing) – flagellum

Class Sarcodina - Ex. *Amoeba* – pseudopodia (microscope)

Class Ciliata - Ex. *Paramecium* (2X2 slide) – cilia

Class Sporozoa - Ex. *Plasmodium* (malaria)

Exercise 10 – Fungus

Kingdom Fungi – eukaryotic, saprophytic or parasitic, lack chlorophyll

Division Eumycophyta – “true” fungi

Class Phycomycetes (algal fungi) – *Rhizopus* or black bread mold pp. 117-119
(microscope & 2X2)

Class Ascomycetes (sac fungi) – *Peziza* or cup fungus (preserved and 2X2)

Penicillium (microscope) – label

Morchella or Morel (preserved and 2X2) p. 123

Urrhula (preserved)

Class Basidiomycetes (club fungi) – Mushrooms (preserved and 2X2) p. 124

Geaster or earth star (2X2 & preserved) p. 125

Mushroom (preserved) p. 126

Gymnosporangium or rust (2X2 & preserved) p. 125

Peziza (preserved) p. 123

Lycoperdon or puffball (2X2 & preserved) p. 125

Cyanthus or bird's nest fungus (2X2 & preserved) p. 125

Coral Fungus (preserved)

Hydnium or bracket (2X2 & preserved) p. 125

Bracket Fungi

Jelly fungi (2X2 & preserved)

Dead Man's Fingers (preserved) p. 123

stinkhorn (2X2 & preserved) p. 126

Lichens – Crustose lichens adhere completely to the surface of the substrate (rock, 2X2)

Foliose lichens: leaflike (tree limb & 2X2)

Fruiting lichens: Reindeer moss, British soldier and Pixy cup (preserved & 2X2)

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