

TERMS TO KNOW

Homeostasis	metabolism	unicellular	multicellular	
Totipotent stem cells	Mitotic Index	Cyclins	CDK's	
Pluripotent stem cells	Stargardt's	Resolution	Prokaryotic	
Eukaryotic	Binary fission	Microtubules	Centromere	
Chromatin	supercoiling	Pasteur	Hooke	
Shwann	Shleiden	Urey/Miller	Endosymbiosis	(MTOC) Microtubule organizing centres
Nondisjunction				G1 S G2
All phases of Meiosis/Mitosis	Bivalants	Chromosome	chromatid	
Purines	Pyrimidines	Histone proteins	Spontaneous generation	
Deoxyribose sugar	Ribose Sugar	Genome	Mutagen	
Oncogenes	Metastasis	synapse	chiasma	

Specific examples to be familiar with..

Stargardt's	Striated muscle	Giant Alga <i>Acetabularia</i>
<i>paramecium</i>	<i>Chlamydomonas</i>	<i>Volvox</i>
<i>Down Syndrome</i>	<i>Turner's Syndrome</i>	<i>Klinefelter's Syndrome</i>
<i>pancreas cell</i>	<i>palisades cell of plants</i>	<i>Bangiomorpha</i>

NEED TO KNOW

• CELL THEORY (1.1)

- The functions of life carried out by unicellular organisms
- How does surface area and volume ratio relate to cell size
- How multicellular organisms have properties that are related to their cellular components
- How cell differentiation works and is involved with expression of only some genes in the genome
- How different cells are derived from different types of stem cells
- How stem cells can be used for therapeutic uses, ex. Stargardt's disease, Leukaemia
- Give examples such as striated muscle, or the giant alga *Acetabularia* as **atypical** examples of cell theory
- What are some ethical concerns related to stem cell use.
- Compare *paramecium* (unicellular eukaryotic organism) to a photosynthetic organism such as *Chlorella* or *Chlamydomonas*
- Calculate magnification and scale bars of micrographs

ULTRASTRUCTURES of CELLS (1.2)

- Structure of prokaryotic organisms compared to eukaryotic organisms.
- Eukaryotes have specific structures to do specific functions
- Electron microscopes have a higher **resolution** than light microscopes
- What are the structures and functions of organelles within a pancreas cell, or a palisades cell of plants
- Identify organelles and infer cellular function from electron micrographs
- Be able to draw and annotate a diagram of a eukaryotic cell

THE ORIGIN OF CELLS (1.5)

- **Explain** theory of endosymbiosis and how eukaryotic cells came to be
- **Discuss** Experiments of Pasteur, Reid and others as they relate to spontaneous generation
- The experiment Urey/Miller and its implication to life's origin
- All cells are composed of the same basic DNA structure which produces proteins

MITOSIS AND CELL DIVISION (1.6)

- **Discuss** chromosome structure and how it's organized in supercoiling
- **Compare** Cytokinesis is different in plants compared to animals (know about cell wall formation in plants)
- **Identify** and **compare/ contrast** stages of interphase and the events that occur in G1 S G2
- **Discuss** cyclins and CDKs control of the cell cycle at specific times
- Relate oncogenes to cancer development
- **Distinguish** the phases of mitosis using microscope images
- **Calculate** mitotic index

STRUCTURE of DNA and RNA (2.6)

- **compare** DNA and RNA polymer structure and nucleotides
- **Contrast** sugar difference between DNA and RNA
- **Identify** and **annotate** Hydrogen bonding, phosphodiester bonding, antiparallel stranding, and purines and pyrimidines in a DNA/DNA molecule
- **Draw** a simple diagram of the structure of the nucleotides of DNA and RNA, using circles as phosphates pentagon's as sugars and rectangles as bases, or Single rings structure for pyrimidines, double ring structure for purines

MEIOSIS (3.3)

- **Explain** cells are diploid and when they are haploid
- **State** the importance Haploid cells allow fusion or fertilization of gametes
- **Distinguish** Events of prophase I, eg. tetrads, bivalents, crossing over followed by condensation
- **Distinguish** Events of metaphase I - Independent assortment, or randomizing chromosomes,
- **Discuss** to how Fertilization promotes genetic variation
- **Identify** and **explain** Nondisjunction disorders such as Down's syndrome, Klinefelter's syndrome, Turner's. syndrome
- Reading a Karyotype chart.