**CELL STRUCTURE/FUNCTION STUDY GUIDE**

**EXAM NEXT CLASS 🡪 Study this!!! Learn it!!! KNOW it!!! Don’t just ‘read it over a few times’!! Bring your computers!!**

**ALL CELLS** (*prokaryotes & eukaryotes*) contain a genetic material (DNA or RNA), ribosomes, cytoplasm & a cell (plasma) membrane

**PROKARYOTES**

* Small, simple cells (therefore they would contain proportionately fewer ribosomes than eukaryotes)
* Single-celled organisms
* CONTAIN genetic material located in a nucleoid region (not a nucleus)
  + The genetic material (DNA or RNA) is circular
* Examples include ARCHAE BACTERIA & EUBACTERIA
* E. coli
* DO NOT contain membrane bound organelles (NO nucleus, no chloroplasts, no mitochondria, no golgi apparatus, no endoplasmic reticulum)

**EUKARYOTES**

* Larger, more complex cells
* Examples include plants, animals, protist, fungi
* CONTAIN internal membranes
  + examples of membrane bound organelles include mitochondria, chloroplasts, nucleus, smooth endoplasmic reticulum, rough endoplasmic reticulum, golgi body
* CONTAIN membrane bound organelles (such as a nucleus, chloroplasts, mitochondria, etc.)
* Can perform photosynthesis (only plants & some protists)

**Plant Cells** (a type of eukaryotic cell)

* Multicellular
* CONTAIN a cell wall that provides structural support and protection (makes the cell less flexible)
* CONTAIN a large vacuole that stores water and nutrients
* CONTAIN chloroplasts

**Protist Cells** ( a type of eukaryotic cell)

* Unicellular
* Photosynthetic protists like Euglena contain chloroplasts
* Heterotrophic protists like Paramecium & Ameobas contain mitochondria

**ENDOSYMBIOTIC THEORY**

* The idea that early prokaryotes (about 3 billion years ago) were joined into a symbiotic relationship which allowed the cell to experience greater reproductive fitness and survivability (prokaryotes evolved into eukaryotes)
* **EVIDENCE**
  + Mitochondria and chloroplasts have DNA coding different from the nuclear DNA
  + Mitochondria have their own system of transcription (copying) and translation (protein expression) that more closely resembles protein synthesis in
  + prokaryotes (bacteria); this supports the idea that mitochondria may have been primitive prokaryotic cells

**VIRUSES**

* are NOT ALIVE (they have no ability to reproduce on their own/they need a host to reproduce)
* they DO NOT have a nucleus or membrane bound organelles (no mitochondria, chloroplasts, golgi apparatus, endoplasmic reticulum)
* they DO have genetic material (DNA or RNA)
* they have a protein capsid that envelopes (covers) the DNA
* lytic cycle = reproductive cycle of viruses that happens rapidly, the virus takes over the replication machinery of the cell immediately and symptoms appear within hours to days (examples, flu virus & norovirus)
* lysogenic cycle = reproductive cycle of viruses where the DNA of the virus incorporates itself into the DNA of the host cell and then takes over the cell at a later time like months or years later (example, shingles virus)

**EXPERIMENTAL DESIGN**

* Hypothesis for experiments done in PAP Bio will follow the ***if, then*** format
* Make sure to identify your Independent variable (variable **I** change, variable **I** manipulate, variable that is **I**solated)
* Make sure to identify your **Dependent variable** (variable you **measure**, variable that **DEPENDS** on the manipulation of the Independent variable)

**SAFETY**

* in order to avoid having to use the emergency eye wash station we wear goggle in

**MICROSCOPE LAB**

* REMEMBER, when we prepared the wet mount of our skin (cheek) cells we needed a microscope slide, a cover slip, and a water based dye (some cells only need water when being prepared; i.e., onion cells)

**IMPORTANT VOCAB:**

Autotrophic = an organism that produces its own food using chloroplasts (plants, some protists)

Heterotrophic = an organism that eats other organisms for food (animals, fungi, some protists, bacteria)

Unicellular = a single cell (protists, bacteria/prokaryotes)

Multicellular = a group of cells that function together as one (plants, animals, fungi)

Asexual reproduction = the method by which some bacteria and protists reproduce (binary fission)