Aim: What were the first cells?

Do Now: List or describe some of the characteristics of animal cells.

Homework:

Study review questions for Test Thursday

Sep 23-11:23 PM

Aim: How are Prokaryotic and Eukaryotic cells related?

Do Now: Make a T- Chart comparing/ contrasting prokaryotes/ eukaryotes

Homework

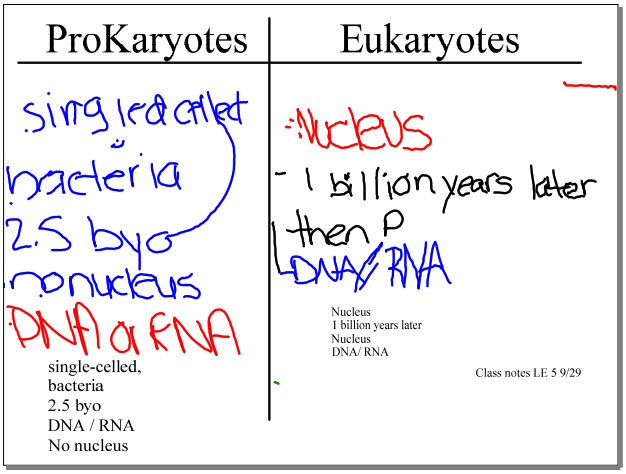
Test Thursday. Study review sheet

Read pp. 454-457 p.23 Regents Review #1-13 Do Not copy questions

Draw the endosymbiotic theory diagram

Do In Notebook

Sep 29-6:52 AM



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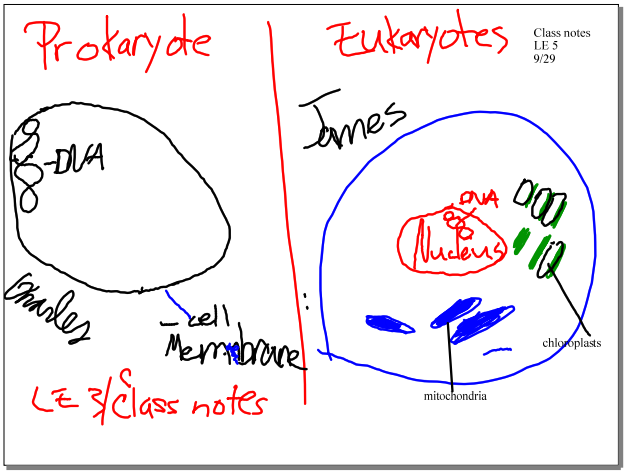


Sep 29-10:15 AM

How many cells do organisms need to live?

A **unicellular** organism is a living thing composed of one cell.
- Carries out all necessary life functions
- **Prokaryotes- single cell, without nucleus**
- Evidence of prokaryotic life in the PreCambrian era - 3.5 bya
- Found as fossils in rock 3.5 byo
- **Cyanobacteria** is most common fossil; ***photosynthetic; still exist today***
- First prokaryotes did not require oxygen

A **multicellular** organism is a living thing composed of more than one cell.
-these individual cells cannot live on their own, cells work together to perform life functions
- **Eukaryotes are cells with nucleii , DNA, & other organelles**

Sep 23-11:37 PM

Where did Eukaryotes come from?

A **multicellular** organism is a living thing composed of more than one cell.
-these individual cells cannot live on their own, cells work together to perform life functions
- **Eukaryotes are cells with nucleii , DNA, & other organelles, including mitochondria.**
- **Most eukaryotes are larger than prokaryotes**

Eukaryotes

- Require oxygen
- Fossil record shows change in rock chemistry about 2.4 bya
- Increase in Oxygen on earth from cyanobacteria does two things:

-destroys marine prokaryotes for whom O_2 is a poison
-becomes O_2 in earth's atmosphere as well as O_3, Ozone

- Ozone layer begins to form, blocking UV rays
- Prokaryotes begin to live on land
- **Endosymbiosis- is theorized to be how eukaryotes formed**

Sep 29-6:10 AM

Endosymbiotic Theory

- Proposed by **Lynn Margulis (1981); cold reception at first**
- Def: A mutually beneficial relationship in which one organism lives in another
- **Theory:**
- proposes that larger cells engulfed smaller cells, and the two lived together
- **Mitochondria** are the descendants of symbiotic, aerobic bacteria
- **Chloroplasts** descendants of symbiotic, photosynthetic bacteria

Evidence

Size & Structure- mitochondria are same size as most bacteria; Chloroplasts are same size as cyanobacteria

Genetic Material- Both Chloroplasts & mitochondria contain genes that are different from those found in the nucleus of host cell, and closely related to bacterial genes (mRNA)

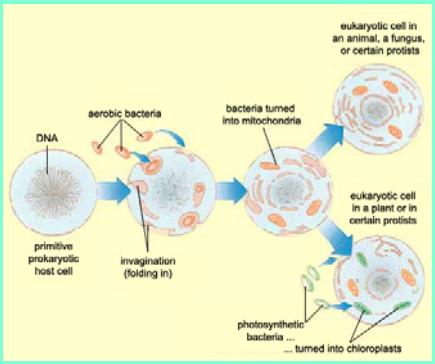
Ribosomes- M & C ribosome related to bacterial ribosome

Reproduction- C & M reproduce by fission, independent of cell cycle

Margulis's theory is now supported by most biologists, much evidence has been found in its favor. For instance, phylogenetic analyses have clearly demonstrated that plastids and mitochondria derive from bacterial lines related to modern-day cyanobacteria and proteobacteria, respectively.

Sep 29-6:24 AM

Endosymbiotic Theory



Sep 29-6:42 AM

Mitochondria all come from Mom

All of the mitochondria in the cells of every human being come from the ovule of that person's mother, who received them from her mother, who received them from her mother, and so on. On the basis of the rate of mutation of mitochondrial DNA, we can estimate the number of years that separate human beings from a common ancestor. Using this method, the search for the ""mitochondrial Eve " scientists have calculated that the species *Homo sapiens*, which includes all modern humans, first appeared about 200 000 years ago. However, this estimate is still the subject of debate.

Also, it is the people of Africa who show the greatest diversity in their mitochondrial DNA, which supports the hypothesis that human beings originated in Africa.

This hypothesis is very well supported by the fossil record.

Sep 29-6:48 AM

LE 3 class notes 9/29

Prokaryotes	Eukaryotes
single celled	'Complex .manyparts/ organelles
don't have a nucleus	-Modern cells
first cells	RNA/ DNA
bacteria in the prokaryote	'nucleus
-DNA	
-cytoplasm	

DNA, cell membrane, nucleus, DNA, C. membrane, organelles

Sep 23-11:25 PM

Sep 29-9:30 AM

LE5 9/29 Formation of Euk.

•Prok. formed into more complex cells

Endosymbiotic Theory Aerobic

mitochondria

Prok Bacteria

Cyanobacteria (Photosynthesis) O_2

Eukaryotic, Aerobic

Sep 29-9:30 AM

Prokaryotes

Ex Archaebacteria and eubacteria

Prokaryotes have the following characteristics:
- No nucleus
- Circular DNA
- No membrane-covered organelles
- Relatively small
- Reproduce quickly

Eukaryotes

Examples: Plants, animals, fungi, and protists

1. Characteristics:
- Nucleus
- Linear DNA
- Many membrane–covered organelles
- Relatively large
- Reproduce slowly
- Found in multi-cellular organisms

Sep 23-11:28 PM

Sep 29-10:29 AM