Biology 11-Ch.16 Review Questions

1. What is Spontaneous Generation?

.      *The hypothesis that life arises regularly from nonlife*

1. What was the experiment Spallanzani conducted in an attempt to prove Spontaneous Generation did not exist?

*Spallanzani tried to disprove disprove spontaneous generation by using the gravy experiment. He would boil the gravy, killing all the possible life forms. Then he would leave on flask open and one closed and saw that only the jar with the open top was teeming with organisms*

1. How were Redi’s conclusions debated by John Needham?

*They were easily debatable because John Needham said that spontaneous generation could only occur under the right circumstances*

1. How was Louis Pasteur’s experiment groundbreaking?

*It was groundbreaking because he used a curved tube as an entrance to the flask, thus making it open to air but also trapping dust and microbes. He then broke off the curved neck and saw that microorganisms started to grow within one day.*

1. What are the five gases in the Earth’s first atmosphere?

*The Earth’s first atmosphere were most likely carbon monoxide, carbon dioxide, hydrogen, mixed with nitrogen,  and possibly other gasses such as ammonia and methane*

1. When was Planet Earth born? When did the Earth’s first ocean start to appear? Why?

*The planet was born approximately 4.6 billion years ago, and the earth’s first oceans started to appear around 3.8 billion years ago due to surface cooling and rain started to fall*

1. What did Stanley Miller think he created back in 1953? Describe in detail his experiment and his outcomes.

*Miller re-created what he thought to be the Earth’s first atmosphere by mixing methane, ammonia, H2O and hydrogen in a flask. He then exposed the contents of the flask to electric sparks to stimulate sunlight. Eventually an organic soup was formed, and in this soup he found urea, acetic acid, lactic acid and several amino acids.*

1. What happens to amino acids in the absence of oxygen? What do they form?

*Amino acids form a linkage of protein chains in the absence of oxygen. They form simple carbs, alcohols and lipids.*

1. What are proto-life cells? Why are they considered “alive”.

*Proto-life cells are the droplets that are formed from the organic soup molecules. They can grow and reproduce and perform very basic life functions such as grow and reproduce, and some can break down glucose.*

1. What were the first true cells? How did they attain food? What kind of organism were they?

*The first true cells were prokaryotes that resemble types of bacteria alive today. They were heterotrophs and obtained food and their energy from organic molecules in the organic soup. They were anaerobes, organisms that don’t require oxygen to survive.*

1. Why were the primitive heterotrophs forced to become autotrophs? Why are they called autotrophs and when did they become common?

*The primitive heterotrophs most likely “ate” all the organic molecules, so natural selection favored organisms that could survive by obtaining a new energy source. These organisms were called autotrophs because they harnessed energy from an outside source. These first autotrophs were common around 3.4 billion years ago.*

1. The first autotrophs used \_\_\_\_\_\_\_\_\_\_\_\_\_ the way present day plants use H2O.

*They used hydrogen sulfide like how present day plants use H2O.*

1. Give an example of a primitive autotroph.

*An example of primitive autotroph are stomatolites*

1. What happened when organisms started to substitute H2O instead of H2S in their metabolic pathways?

*Because organisms started to substitute H2O instead of H2S in their metabolic pathways, the photosynthetic organisms started to release O2, which was deadly to all of the anaerobic organisms*.

1. What is metabolism?

*Metabolism is the total sum of all the chemical reactions that occur in a living thing.*

1. What are two positive things that came out of the release of oxygen in the Earth's atmosphere?

*The first positive thing that came out of the release of oxygen in the Earth's atmosphere is that it contributed to the creation of the ozone layer, which protects living things on Earth from ultraviolet radiation. The second positive thing is that it lead to the evolution of the eukaryotic cell, which is a cell that contains a nucleus and DNA.*

1. How did sexual reproduction speed up the evolutionary process?

*Sexual reproduction sped up the evolutionary process because it creates genetic variation, therefore increasing the chances of the species evolving*

1. What is the symbiotic theory of eukaryotic origins?

*The symbiotic theory of eukaryotic origins is the theory that eukaryotes evolved when ancient aerobic prokaryotes that were similar to today's chloroplast and mitochondria merged within other prokaryotic cells. Over time, a symbiosis started to occur. The symbiosis provided a home to the aerobic prokaryotes, and the host cell containing these mitochondria/chloroplast like cells were able to produce energy faster and more efficiently because it could use oxygen to its full potential by using it in its metabolic pathways. Eventually natural selection favoured these types of symbiotic cells and gave way to the eukaryotic cell.*

1. What are the key differences between asexual and sexual reproduction?

*The key differences between asexual and sexual reproduction are:*

*A)****ASEXUAL***

*1) use binary fission*

*2)efficient and effective*

*3)daughter cells are exactly alike-->no genetic variation*

*B)****SEXUAL***

*1)shuffles genes*

*2)has genetic variation*

*3)causes evolutionary change*

*4) multicellular organisms may not have evolved without it*

1. What is a microfossil? How much detail do they provide?

*A microfossil provides the outlines of ancient cells that have been preserved in time. They provide enough detail to identify these ancient cells as prokaryotes.*