

Adhesion:

- The attachment of molecules to the walls of conducting tubes, as in plants.
- Property of water
- When similar particles cling together based on what surface they are on.
Basically it is not a water-water interaction.

Archean eon:

- Spanned for about 20 levels in the 72 floor building analogy.
- 3700 Ma - Photosynthesizing bacteria
- 3500 Ma - Oldest fossils
- 3400 Ma - Small continents form
- 3100 Ma - Continents begin shifting
- 2700 Ma - First eukaryotes
- 2600 Ma - Bacteria on land
- 2500 Ma - Banded iron formations
- Organic molecules assemble themselves into the 1st living cell, surrounded by a bilipid layer. They are called the archea
- Known to be able to live in extreme anaerobic conditions; possibly one of the first organisms to split protons off water, thus creating oxygen in the atmosphere.

Biomonomers:

- Smallest possible unit of a macromolecule. Contains the basic functional group of the type of macromolecule, and the ability to form polymers is in its ability.
- Identical or nearly identical. Form polymers due to polymerization

Biopolymers:

- Combined subunits of identical or nearly identical molecules that combine together with polymerization.
- Contains proteins, nucleic acids, carbohydrates, and lipids.

Carbon:

- Element that has four possible bonding sites thus making central to life. CO₂ is considered inorganic, and other carbon molecules with oxides, everything else is considered organic with carbon
- Monomers that contain carbon are always a good source of fuel, whether it be for cellular respiration or combustion purposes.

Central Dogma:

- Dogma means principle
- Central dogma of biology includes the process of DNA replication, transcription, and translation. From DNA to RNA to protein.
- It is the way genetic information is shared in order to synthesize proteins and build structures in the body.

Chemical evolution:

- A factor in the origin of life in the hadean era.

- Origins of organics: Prebiotic soups, Hydrothermal vents, _____, _____, . Started off as monomers of course. The polymerization effect would be considered as chemical evolution.
- Chemical evolution can be referred to:
Nucleosynthesis(formation of chemicals with regards to the big bang), Molecular evolution(evolution at the scale of molecules), gas evolution. (process of creating oxygen through a molecular reaction)

Cohesion:

- Property of water. High resistance of separation of water molecules.
- Intermolecular attraction between like molecules.
- Reason why water will always take the shape of it's container.

Crystal Lattice of water:

- When water is turned into a solid (ice) The molecules are shaped into a crystal lattice arrangement (hexagonal polymer of water)
- Decreases density by 10% as water as a liquid is more packed together.
- Crystal lattice of water and the diminishment of density is a special property of water, not common in other elements.

Emergence:

- More than the sum of the parts
- A good example would be H₂O, Where its ion/element subunits do not have similar properties to the combined molecule, the following characteristics of water surfaced as the two combined. This is an example of emergence.
- Living things become more and more complex with the combination of cells, elements, macromolecules, etc. Large factor in evolution.

Evaporation:

- When a element/compound in a liquid state is heated past it's specific heat capacity as a liquid and thus is transformed into gas.
- Rapid movement of molecules in this state.
- Only occurs on the surface of a liquid. It is vaporization.

Geological time scale:

- Hadean 4600-3800Ma
- Archean Eon 3800-2500Ma
- Protozean 2500-543Ma
- Phaneorozoic Eon 543-Present
 1. Paleozoic era 543-251 Ma
 2. Mesozoic era 251-65 Ma
 3. Cenozoic era 65-present

P m c

Happiness is partly multiple choice

Green House Gases:

- Gas in the atmosphere that absorbs and emits radiation within the thermal infrared range.
- Fundamental cause of greenhouse effect.
- The primary greenhouse gases in the Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone.
- The burning of fossil fuels increase CO₂ emissions by about 30% , obviously possibly causing global warming.

**Hadean eon:

- 4600-3800Ma
- Formation of the solar system,galaxies and planets. Ends with traces of life In rocks
- Byproducts of the chemistry of life is found in rocks.
- Inhabitable parts of the solar system
- Included a building phase and a _____ phase

Hydrogen bond:

- Noncovalent bond formed by unequal electron sharing between hydrogen atoms and oxygen,nitrogen and sulfur atoms. Known to be the second weakest type of bond.
- Water is held together by polar covalent bonds, but they are attached to other water molecules by hydrogen bonds.

Hydrophilic:

- Property found in macromolecules/elements that makes them attracted to water, or able to react with water.
- A hydrophilic **molecule** or portion of a molecule is one that is typically charge-polarized and capable of **hydrogen bonding**, enabling it to dissolve more readily in water

Hydrophobic:

- When a molecule has a non polar terminus in its composition thus it cannot react with water and form a hydrogen bond between its molecules.
- Prime example: water and oil.

Hydrothermal Vents:

- Is one of the factors of the origins of organics
- Fissure in the planets surface which geothermically heated water issues.
- Hot springs,fumaroles,geysers

Interstellar organic compounds:

- Organic compounds found in outer space. Looking at the

monomer/polymer unit of stars,galaxies,etc.

- Interstellar means: Occuring or situated between stars.

Micelles:

- Small version of liposomes
- Sphere composed of a single layer of lipid molecules
- When two water soluble micelles interact with eachother, (A+B) they become insoluble as a product. They will start to grow and even divide. This is a mechanical process.

Miller Experiment:

- Miller-Urey experiment consisted of designing a laboratory simulation of the reducing atmosphere believed to have existed early on Earth.
- After a week, miller found a large assortment of organic compounds: urea, amino acids, lactic,formic, and acetic acids. 15% of the carbon ended up in molecules in living organisms today
- This apparatus simulates primordial earth.

Nonpolar compound:

- A compound that is not polar.
- Does not form hydrogen bonds with polar molecules; does react with non polar molecules with vandeerwaals forces.
- Good example would be a hydrocarbon.

Panspermia:

- In biotic chemistry, Panspermia is a factor (how?)
- Is the [hypothesis](#) that life exists throughout the Universe, distributed by [meteoroids](#), [asteroids](#) and [planetoids](#)
- Suggests that life seeds came from outer space and planets. Panspermia means seeds everywhere.

Phanerozoic Eon:

- Multicellular organisms start to appear.
- Protozoic, Cenozoic, and Mesozoic era are all included in the Phanerozoic Eon.
- The whole eon included:
- Dinosaurs disappearing, mammals and birds -M (251-65Ma)
- Flowering plants, dinosaurs, even more insects-P (543-251 Ma)
- Marine invertebrates,algae “Cambrian explosion” first land plants/insects.

Polar compound:

- A chemical compound that is polar
- Water is a prime example.
- Polar compounds attract to each other.

Prebiotic Soup:

- Said to be an origin of organics

- Life began in a pond or ocean as a result of the combination of chemicals from the atmosphere and some from outer space and planets.

Proteins First hypothesis:

- Assumed proteins were the first used biological molecule used to transfer information between organisms.
- RNA first hypothesis is more accepted than this.
- Protein world is the term used to refer to proteins being the first biological molecules, but it is known that RNA is the most likely candidate.

Proterozoic Eon:

- Oxygen atmosphere began to form
- Single celled organisms began to develop.
- 2500-543 Ma

Protocells:

- Sub-unit of protobionts.
- Bubble hypothesis implies that protobionts can be made by shaking macromolecules together. Vinaigrette salad dressing is an ideal example of this.
- Composed of a fatty acid membrane and RNA ribozymes that are encapsulated.

Reducing Atmosphere:

- is an **atmospheric** condition in which **oxidation** is prevented by removal of **oxygen** and other oxidising gases or vapours, and which may contain actively reducing gases such as **hydrogen**, **carbon monoxide** and gases that would oxidize in the presence of oxygen, such as **hydrogen sulfide**.
- Early earth had a reducing atmosphere

RNA world:

- Hypothesis that concludes that the earth's first biological molecule for replication and genetic information would be RNA.
- They are self replicating thus must be precursors to life.
- Ribozymes would be the first type of RNA, and then from ribozymes, we start with RNA, then RNA that makes protein, then RNA that makes proteins which make DNA.

Specific Heat:

- Every element/compound has a specific heat capacity, in other words, how many degrees does it take to change a substance's temperature by an amount. Water's SHC is 100 degrees Celsius, after this it turns into a gas.

Spontaneous origins:

- is an obsolete body of thought on the ordinary formation of living organisms without descent from similar organisms.
- Every evolutionary theory of life is based on spontaneous generation.
- The first alive organism was probably the largest factor of spontaneous generation.

Surface Tension:

- The force that places surface water molecules under tension, making them more resistant to separation than the underlying water molecules
- Allows some insects to be able to float on water, and things like paper clips can float on water.

Surfactant:

- Compounds that lower the surface tension of a liquid, the interfacial tension between two liquids or a liquid and solids.
- Detergents, wetting agents, emulsifiers, foaming agents are all surfactants.

Vesicles:

- A small, membrane-bound compartment that transfers substances between parts of the endomembrane system.
- Found in animal, plant cells.
- Small bubble within a cell. Enclosed by a lipid bilayer. Type of organelle.

Volcanic outgassing:

- Release of gases into the atmosphere during volcanic eruptions. A lot of our atmosphere (water vapor, argon, nitrogen) came from outgassing.
- Thus the first atmosphere was greatly formed by this.