

The origins of life



As you may imagine, the Earth did not just pop out of nowhere and suddenly life appeared on it; there were several processes that had to happen before we got the world we live in. First of all, the Big Bang, where atoms, stars and galaxies were formed as a result of this. Then, elements like carbon, hydrogen and oxygen were formed and were forced together by the force of gravity, and thus, the Earth was born. But the primitive Earth was very different from nowadays, it didn't have any oxygen but there were other gasses like hydrogen, methane, carbon dioxide, and ammonia floating around. There was also a very high temperature and a lot of energy from sun and lightning due to the absence of atmosphere. So how was life formed? There exist a theory that is the most reasonable to the day, which explains how life could arise from these conditions. This is the Biochemical Evolution Theory, proposed by Oparin in 1922, which states that life was formed by steps of biochemical reactions that were only possible in the primitive Earth's conditions. First, there was the initial generation of some of the key molecules of life (nucleic acids, carbohydrates, proteins and lipids) by non-biological processes.

Then there was the transition of pre-biotic chemistry to replicating systems, which were sophisticated by time until they were able to form living cells. Thirdly, with the help of energy from the sun and lightning, biochemical reactions occurred so that monomers and unicellular organisms could evolve into polymers. Lastly, the biochemistry was isolated from the environments, allowing cells to adapt to these and then forming colonies that evolved into complex multi-cellular organisms.

Stanley Miller later proved this theory in 1953 with the Miller-Urey Experiment, also known as the “pre-biotic soup” experiment, where they simulated the same conditions of the primitive earth in a closed environment and let it rest for some weeks until they got some pretty interesting results. The experiment used water (H₂O), methane (CH₄), ammonia (NH₃), and hydrogen (H₂). The chemicals were all sealed inside a sterile array of glass tubes and flasks connected in a loop, with one flask half-full of liquid water and another flask containing a pair of electrodes. The liquid water was heated to induce evaporation, sparks were fired between the electrodes to simulate lightning through the atmosphere and water vapor, and then the atmosphere was cooled again so that the water could condense and trickle back into the first flask in a continuous cycle. At the end of one week of continuous operation, Miller and Urey observed that as much as 10%–15% of the carbon within the system was now in the form of organic compounds. Two percent of the carbon had formed amino acids that are used to make proteins in living cells, with glycine as the most abundant. Sugars, lipids, and some of the building blocks for nucleic acids were also formed. These results clearly resemble the previously proposed theory of Biochemical Evolution, it has also been supported by other experiments, and this is the reason why it is the most convincing theory to as how life arose from nowhere.

Another explanation that can be found in other sources is the belief that God managed to make everything in seven days, but as we can see, it took Him some thousands of years more to create such a complex thing we now recognize as life. Only in a reducing atmosphere like this,

synthesis of organic molecules ??” also sugars and organic bases, building blocks of nucleotides ??” would have been possible in large amounts???

(Chyba, Sagan 1992).