

# The Origin of Life According to Melanin

## Abstract

Cells can reproduce and pass on genetic information from one generation to the next, metabolize matter and energy, and can evolve. But explaining how the process originated is one of the great problems of science. The vague idea that life emerged spontaneously from mixtures of molecules in the probiotic era has no sustenance, it cannot be explained, not even by chance. Apparently, there is no way to explain the origin of life by natural means to date. The creation of life from inanimate compounds is a mystery that seems to deepen every day more. But suppose there is a substance that seems to represent the boundary between an inanimate compound and another animated. An inanimate compound that tends to approach energy sources and surround them. A compound that does not present structures like any of the cell prokaryote or Eukaryote cell. A boundary compound between the living and the non-living that does not show changes in its structure and something that could be considered evolutionary despite billions of years of elapsed time. A molecule whose proven stability is 160 million years old. A substance that seems to mark the frontier between the living and the non-living matter, widely disseminated in the universe and in all living beings; and whose main characteristic is that it is capable of absorbing visible and invisible light and dissipating the energy absorbed by dissociating the water molecule, such as chlorophyll in plants. If we want to explain the origin of life arising from a substance with the characteristics above noted and others, then it is possible that the much sought-after explanation of the origin of life is very close to being achieved. The name of the molecule concerned is melanin.

**Keywords:** Cells; Metabolize matter; Melanin; Eukaryote cell

## Research Article

Volume 5 Issue 1 - 2018

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**Received:** December 01, 2017 | **Published:** January 10, 2018

## Introduction

There are diverse theories about the origin of life on Earth. Perhaps it started with an electric spark that generate amino acids and sugars from an atmosphere loaded with water, methane, ammonia, and hydrogen, and over million years, larger and more complex molecules could form. Other possibility is that molecules of life met on clay due to DNA are relatively well preserved in those conditions. Or maybe life began at the bottom of the sea, at deep-sea vents or submarine hydrothermal vents those spewing hydrogen rich molecules. Or under layers of ice, that perhaps protected organic compounds in the water below from UV rays. Or better the RNA world because RNA can create DNA and proteins, and has on-off switch function for some genes. However, scientists calculate that it would take much longer than the age of universe for randomly generated RNA molecules to evolve sufficiently to achieve the modern level of sophistication of the vast biological complexity on Earth today. In other words, it would take forever. Furthermore, synthetic RNA, created with modern technology trying to prove of the concept of RNA world; bear little resemblance to anything anyone has ever isolated from a living system. The finding that all the enzymes involved in genetic code translation have virtually identical cores or Urzymes (Ur -earliest-), suggest simple ancestors (peptides) that evolved to give rise to more complex life forms. However, the main question is simply carried back: How did these peptides originate with so accurate catalytic capacity? Another theory is simple molecules interacting with each other in cycles of reaction

that eventually evolved. Or perhaps life was brought here from elsewhere in space, a theory known as panspermia. The theory of special creation proposes that life was created by a supernatural power. Abiogenesis or autogenesis states that life originated from nonliving things, spontaneously. Other discarded theories are the eternity of life, and theory of catastrophism.

## Background

The idea of a reducing atmosphere has been tested and basic compounds supposedly were formed, but the Earth's early atmosphere was fundamentally different from the gasses used by Miller & Urey [1]. The reducing gasses used in the Miller-Urey experiment were different from CO<sub>2</sub> prevalent Earth's early atmosphere, and carbon dioxide does not support the rich array of synthetic pathways leading to possible monomers [2]. Even today, volcanic gasses do not contain methane or ammonia, and are not reducing, because the Earth's mantle would have been the same in the past as they are today [3]. The chemical properties of Earth's interior have been essentially constant over Earth's history, leading to the conclusion that life may have found its origins in other environments or by other mechanisms [4]. In regards the theory that life evolved from simple organic molecules, e.g., near some hydrothermal vent, then explanation of how amino acids or other key organic molecules linked up to form polymers (long chains) like proteins or RNA in an astonishing and unceasing manner. The problem is that two amino acids do not spontaneously join in water. Rather, the opposite reaction is thermodynamically favored

[5]. Water tends to break down protein chains into amino acids or other constituents, making it very difficult to produce proteins or other polymers in the entirely hypothetical primordial soup. Above theory has been complemented with additional hypothesis as protobionts, defined as early forms of life, conformed by small droplets with membranes that supposedly are able to maintain a stable internal environment and continuously form, eventually evolved enough to keep information and later can replicated.

### The RNA World Hypothesis can't Explain the Origin of Genetic Information

RNA world advocates suggest that if the first self-replicating life was based upon RNA; it would have required a molecule between 200 and 300 nucleotides in length [6]. However, the order of those nucleotides cannot be explained by any chemical or physical law already known. The odds of 250 nucleotides in an RNA molecule by chance is below the universal probability bound (1 in  $10^{150}$ ) [7]. To evolve into the DNA/protein-based life that exists today, the RNA world would need to evolve to convert information to proteins. This process of transcription and translation requires a large suite of proteins and molecular machines. Therefore, the origin of life cannot be explained arising from unguided chemical processes. The life cannot exist unless both the genetic information and transcription/translation machinery are present at the same time, and both speaking the same language. The entire system must come into being as one unit, or it is worthless [8]. The nucleotide sequence is meaningless without a conceptual translative scheme and physical hardware capabilities [9]. In the case of the Oparin hypothesis, there is a primordial soup or solution containing many essential elements and compounds, although no one knows where they come from. Supposedly, early life on earth formed through a series of reactions that made simple compounds gradually more complex. But the Oparin's primordial soup or water-based sea of simple organic molecules, out of which life arose via unguided chemical reactions, faces numerous scientific difficulties. Newest addition is the occurrence of life as matter of inevitability that means that matter will generally develop into systems that, when driven by an external source of energy, and surrounded by a heat bath become increasingly efficient at dissipating energy. This heat bath probably refers to melanin.

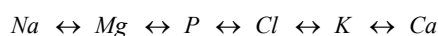
### Earth Formation

When the Earth formed some 4.5 billion years ago, it was a sterile planet inhospitable to living organisms due to presence of hot, noxious gases, erupting volcanoes, and raining meteors. One billion years later, we have a watery planet with microbial life. Life began in four steps of increasingly complexity: cosmic, geological, chemical and biological. The life evolved in nutrients-rich oceans originated by the same process: the unsuspected intrinsic property of melanin to absorb light and dissipating it through water dissociation, as chlorophyll in plants. The problem with theories on the origins of life is that they don't propose any experiment that lead to the emergence of cells. Before there was life on Earth, there were molecules. But they were molecules that were formed in a random way, far away from the prodigious

order observed in living organisms. How they began to form in an orderly, consistent manner; and sooner or later, they started replicating, has been one of science's enduring mysteries.

### Living Things can Make Chemical Elements, not only Organic Matter

So far, it has been considered the origin of life without even mentioning that transmutation was possible in living beings. But since the year 1600, it is known that the plants have chemical elements that the soil where they are located does not possess. Hence the idea of the alchemists about the philosopher's Stone was born. Transmutation is a word that has been demonized because of the alchemists, who sought to transform lead into gold. And in the end, they were right, but this transformation (transmutation) was attained hardly in relatively recent dates. Sodium appears to be critical in the chain of chemical elements, because even in the vegetable kingdom, it is difficult to find plants with high sodium levels, except for broccoli containing, on average, 33mg per 100g of the plant. Sodium could be considered as the building block of chemical elements with highest number of protons, such as Mg, P, Cl, K, and calcium; thereby it is widely used in the metabolism of living beings. In the case of chemical elements commonly found in living thing, we have something as a general order:



In proton numbers (atomic number or Z):



We could say that the coming and going of the protons between the different chemical elements is determined by several factors, but one of the important ones is the available energy (from melanin). Depending on the balance of the physicochemical variables present, the formation (transmutation) of the necessary-for-life chemical elements will be given in such or such manner. It is possible that, from hydrogen, melanin can give rise to many elements, mainly those related to life, for example carbon are 6 hydrogens together, oxygen 8 protons, which would explain the presence of water (and oxygen) on planet Earth. Therefore, glucose is the universal precursor of any organic matter in plants and animals, by the carbon chains it contains and the order so precise of them. Once it enters the body, the carbon chains are transformed in several and precise ways, this is: elongated, rotated, combined, sectioned, etc.; but always in the same way and with the same exactness over millions of times and millions of years. But our body can only do it with glucose and its derivatives, similar and related. If we administer carbon alone, for example, mineral, without having the sequence of glucose; simply our body cannot metabolize it.

The atoms or molecules that the body requires to replenish every day are the biomolecules that for one reason or another are degraded and are no longer useful or recyclable, our body takes from food, but they must have a similar story to ours, that is to have been formed based on the photosynthesis, either chlorophyll or melanin. Our body cannot metabolize substances that go so back in evolution. It must have a certain degree of previous processing

like our metabolism. The carbon atoms and chains of the molecules of glucose are easily assimilated and from there our body builds the biomolecules it requires to constantly replace them in one or another tissue or cell of the organism. Glucose is as important as a universal precursor of biomass that is not normally excreted, and which can be found in urinalysis, are compounds that derive from it and/or its respective metabolites. Something similar we could point out the sodium, as it could be considered as one of the main building blocks but of the electrolytes, for the reasons mentioned above. And now that the role of glucose has been discerned as a source of biomass but not energy, we can remark the role of water as the substrate par excellence to complete the process of transformation of light into chemical energy through dissociation, without detriment to the other biological functions of it, starting with being the universal solvent. The origin of the chemicals elements in the stellar space can also be explained by the melanin, as these form large masses of the size of galaxies or more [10]. The formation of chemical elements has ceased to be a monopoly of the stars. Living organisms can also do it, and apparently on a daily basis.

### Conclusion

Biology is entering a new era. The discovery that molecular hydrogen is the source of energy of the cell, and that it obtains it by dissociating the molecule of the water [11]; which implies the need to deeply reorganize our concepts about cell metabolism. Glucose cannot provide the energy that its own metabolism requires, and only contributes with the carbon chains that our body uses to synthesize the organic molecules that make up us. But the energy required to impel and carry out the complex biochemical reactions necessary to the interior of the organism and the cells, is obtained from the visible and invisible light [12]. Melanin has gone from being a simple solar filter to be the central molecule of life. Any changes that occur inside the cell or the organism as a whole; It depends entirely on the chemical energy that emanates from the melanin, in the form of molecular hydrogen and high-energy electrons. The approximately 7000 chemical reactions already described in the literature about cellular metabolism will have to be rethought based on the energy of melanin and not glucose. The glucose molecule, without the presence of the energy of the melanin, it would be an inert molecule, or even more, it would not even exist, because the formation of the glucose, which is an exact process, requires quiet exact energies, like those that come from the melanin. The way in which the melanin dissociates and re-associates the water molecule that is: liquid-gas could be represented as 0 and 1, like a binary code, which abound in

nature. Therefore, it is possible that the melanin not only delivers energy, but also information.

### Acknowledgement

My research project was partially or fully sponsored by (Human Photosynthesis® Research Center) with grant number (101217).

### Conflict of Interest

None.

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