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Short communication

The unexpected capacity of melanin to dissociate the water molecule fills the gap between the life before and after ATP.

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Abstract

The major energy currency molecule of the cell, ATP, and its relationship with melanin in the context of creationism are analyzed. These complex molecules are critical for all life from the simplest to the most complex. They are two of millions of enormously intricate nanomachines that need to have been designed in order for life to exist on earth. ATP is an excellent example of irreducible complexity because it is necessary in its entity in order for even the simplest form of life to survive. Without ATP, life as we understand it could not exist. How did life exist before ATP?

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ATP

ATP is an example of a molecule that displays *irreducible complexity* which cannot be simplified and still function. Without ATP, life as we understand it could not exist. It is a perfectly-designed, intricate molecule that serves a critical role in providing the proper size energy packet for scores of thousands of classes of reactions that occur in all forms of life. Even viruses rely on an ATP molecule identical to that used in humans. The ATP energy system is quick, highly efficient, produces a rapid turnover of ATP, and can rapidly respond to energy demand changes. Among the questions evolutionists must answer include the following, "How did life exist before ATP?" "How could life survive without ATP since no form of life we know of today can do that?" and "How could ATP evolve and where are the many transitional forms required to evolve the complex ATP molecule?" No feasible candidates exist and none can exist because only a perfect ATP molecule can properly carry out its role in the cell. No simple means of producing ATP is known.

Chloroplasts

Chloroplasts are double membraned ATP-producing organelles found only in plants. Inside their outer membrane is a set of thin membranes organized into flattened sacs stacked up like coins called *thylakoids* (Greek *thylac* or sack, and *oid* meaning like). The disks contain chlorophyll pigments that absorb solar energy which is the ultimate source of energy for all the plant's needs including manufacturing carbohydrates from carbon dioxide and water . The chloroplasts first convert the solar energy into ATP stored energy, which is then used to manufacture storage carbohydrates which can be converted back into ATP when energy is needed.

The chloroplasts also possess an electron transport system for producing ATP. The electrons that enter the system are taken from water. This sentence is truth full. Furthermore, it is valid to vegetables and mammals, fishes, birds, etc., because chlorophyll is to vegetable kingdom as melanin is to animal kingdom. Both compounds dissociate the water molecule.

Melanin

Furthermore, melanin is thousands of times more efficient than chlorophyll to transform photonic energy into chemical energy working even in the night. Besides at the fact that it is extraordinary stable (millions of years), melanin could fit the energetic gap between the origin of

life (before ATP) and the creation of the first molecule of ATP.

Melanin is a compound very stable in water, and this characteristic allowed that the next chemical reaction could be implemented by Nature itself along the millions of years that could be necessary to develop the critical next step. However, the very first energetic price was paid off by melanin (and water and light also, of course). It is not by chance, that the exactly compound that drives ATP synthase is Hydrogen (The proton gradient that results is used to drive ATP synthesis by use of the AT-Pase complex), because the very first was the water dissociation by melanin, a photochemical reaction that modifies significantly the concentration of hydrogen and oxygen in water, however, the resulting energy of this continuous water splitting process (by melanin) is carried by hydrogen. Then, the fundamental substance is hydrogen and not the oxygen, recall that oxygen is toxic at any level.

Melanin, Light, Water and ATP.

The photochemical reaction that could be appointed as human photosynthesis (or animal photosynthesis more widely), explains certain details about ATP. In instance:

ATP is only one of hundreds of thousands of essential molecules, each one that has a story. As each of those stories is told, they will stand as a tribute to both the genius and the enormously complex design of the natural world.

We know only four basic methods of producing ATP: in bacterial cell walls, in the cytoplasm by photosynthesis, in chloroplasts, and in mitochondria. No transitional forms exist to bridge these four methods by evolution, except if we take into account the unexpected capacity of melanin to dissociate water.

According to the concept of irreducible complexity, these ATP producing machines must have been manufactured as functioning units and they could not have evolved by Darwinism mechanisms. Anything less than entire ATP molecules will not function and a manufacturing plant which is less than complete cannot produce a functioning ATP.

Although other energy molecules can be used for certain cell functions, none can even come close to satisfactorily replacing all the many functions of ATP, except hydrogen itself. Over 100,000 other detailed molecules like ATP have also been designed to enable humans to live, and all the same problems related to their origin exist for them all. Many macromolecules that have greater detail than ATP exist, as do a few that are less highly organized, and in order for life to exist all of them must work together as a unit.

Note that ATP is an *energy-coupling agent* and *not* a fuel. It is not a storehouse of energy set aside for some future need. Rather it is produced by one set of reactions and is almost immediately consumed by another.

The ATP synthase revolving door resembles a molecular water wheel that harnesses the flow of hydrogen ions in order to build ATP molecules. Each revolution of the wheel requires the energy of about nine hydrogen ions returning into the mitochondrial inner chamber . Located on the ATP synthase are three active sites, each of which converts ADP to ATP with every turn of the wheel. Under maximum conditions, the ATP synthase wheel turns at a rate of up to 200 revolutions per second, producing 600 ATPs during that second.

The enormous amount of activity that occurs inside each of the approximately one hundred trillion human cells is shown by the fact that at any instant each cell contains about *one billion* ATP molecules. This amount is sufficient for that cell's needs for only a few minutes and must be rapidly recycled. Given a hundred trillion cells in the average male, about 10^{23} or one sextillion ATP molecules normally exist in the body. For each ATP "the terminal phosphate is added and removed 3 times each minute" .

The total human body content of ATP is only about 50 grams, which must be constantly recycled every day. The ultimate source of energy for constructing ATP is food; ATP is simply the carrier and regulation-storage unit of energy. The average daily intake of 2,500 food calories translates into a turnover of a whopping 180 kg (400 lbs) of ATP.

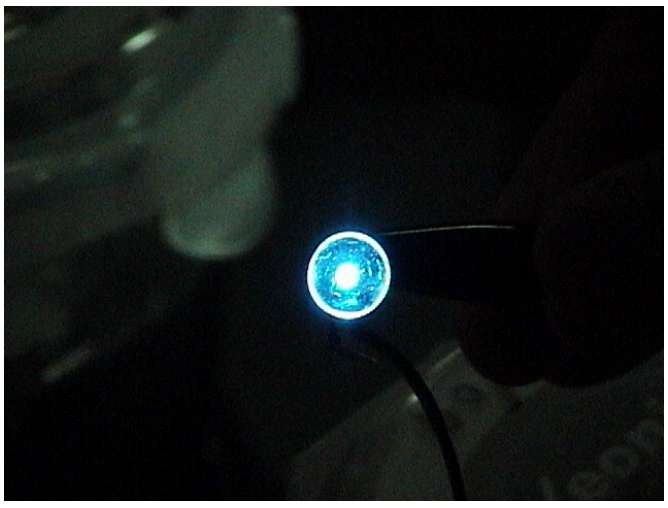

Figure 1: *LEDs enlightened with "human chlorophyll".*

However, this whopping turnover is difficult if not impossible to explain it in accord with thermodynamic laws, even sound more miracle-like than real, and human photosynthesis could explain much better this awe-inspiring process than the average daily intake. Undoubtedly, melanin is the missing link.

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