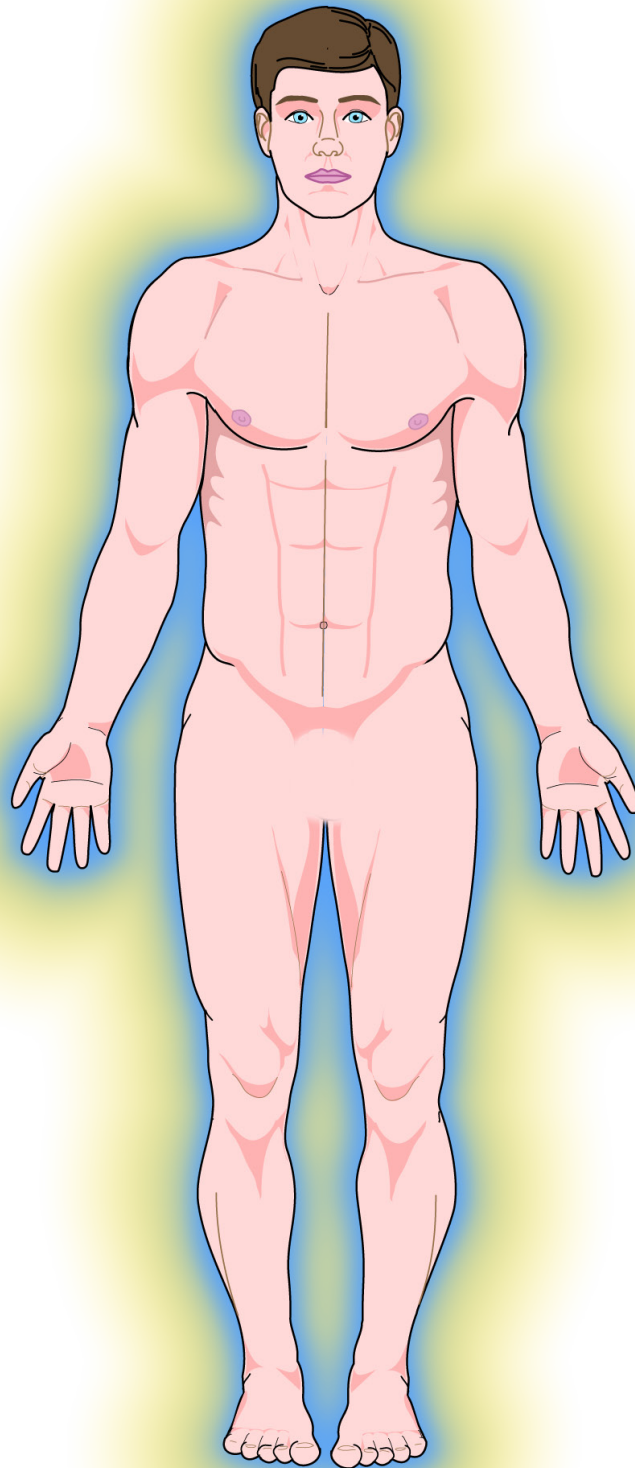


# The Electric Man



## Introduction

Seen from the generally accepted point of view complex living organisms originate from basic elements. There is a "building up," from atoms to small molecular units to large bio molecules such as proteins and nucleic acids, DNA and RNA and finally the basic unit of life, the cell. Living organisms and even individual cells can be extremely complex and diverse.

"Vital forces," energy and electricity play a major role in the maintenance of physical life. For example in plants photosynthesis takes place in chloroplasts, where light is converted into chemical energy. This energy is then used by the plant for all kinds of activities and functions. In the human cell the mitochondria are the structures where useful energy is produced.

### How is energy mobilized in living systems?

Much of the energy in living systems comes from the hydrolysis of a special molecule that acts as the universal energy transacting intermediate in the body. In its "charged up" form it is ATP, or *adenosine triphosphate* – with three phosphate groups joined to one another and to the chemical group adenosine. ATP "discharges" its energy by splitting off a phosphate group at the end, to give the "discharged" form, ADP or adenosine diphosphate.

In the human cells energy (ATP) is generated by the power of electron transport along the inner membrane of the mitochondrion coupled with proton transport across the inner mitochondrial membrane.

In the process of ATP production out of the chemical and electrical interactions a form of useful energy is produced, which can be used by the cell. You can compare this with a mechanical motor, where also useful energy is produced (equivalent of ATP) as well as heat. In both cases the heat can only be dissipated into the environment.

Several similarities can be noted between the *electric* aspects of the universe and the cell. In both cases the concept of a double layer plays an essential role. Also the electricity involved is always *dynamic*, not static. And as in many cases plasma, as cytoplasm in the cell, plays a crucial role as a medium or vehicle where all these processes take place.

It is for this reason that medical science will eventually find the truth (and already they are sensing it) that it is impossible to fundamentally change the personality and the physical equipment of a man through treating the glands themselves.....

This situation will remain as it is until modern medical science recognises that the world of causes (as far as the endocrine glands are concerned) is the etheric body with its seven centres; they will then register the fact that all work in relation to the glands must be shifted away from the seven effects or precipitations of the centres on to the centres themselves.

The healer, therefore, ignores the gland involved and deals directly with the centre which conditions the "point of friction" and controls the area under its influence; this necessarily includes the gland which the centre has created, formed or precipitated and energised.

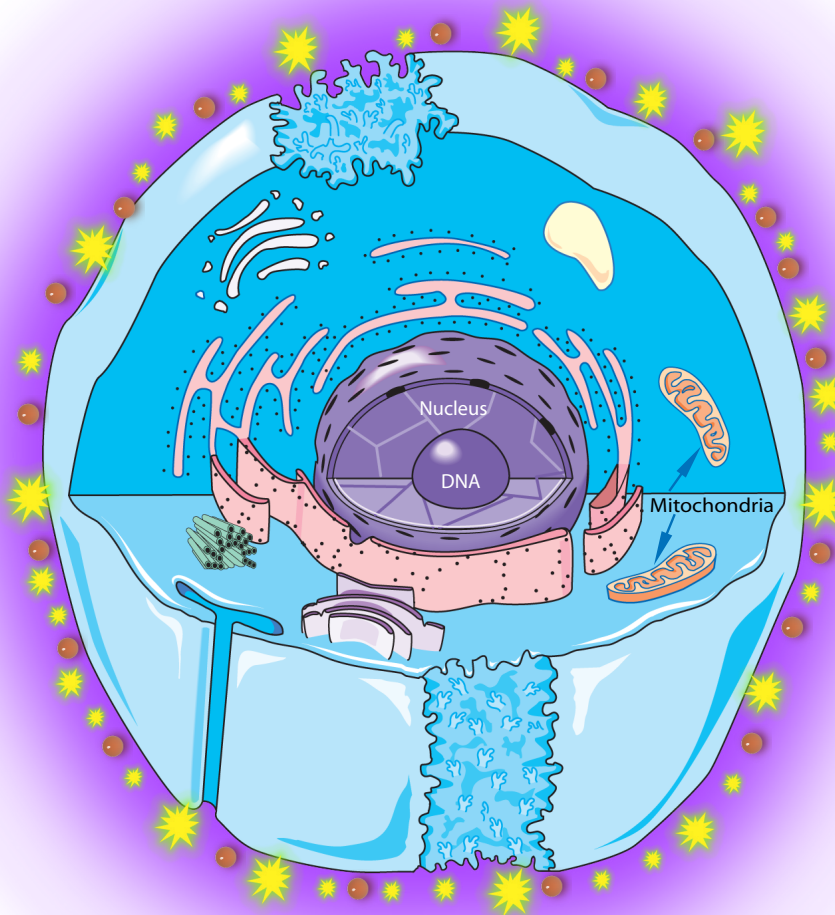
*Alice A. Bailey, Esoteric Healing, page 626*

Electricity cannot, except under prepared conditions, be seen, yet it is matter.

The universal ether of science no one ever saw, yet it is matter in a state of extreme tenuity.

*H.P. Blavatsky Collected Writings Vol IV*

# The Cell



In the cell membrane every second over 80.000 electrical (biochemical) reactions take place.

Within the cell many different **organelles** are to be found. Most known is the **nucleus**. This nucleus is surrounded by many other organelles. One type of these organelles is called the **mitochondrion**, which plays an essential role in the energy production and energy distribution of the cell.

In human cells, the mitochondria are the structures where energy (ATP) is produced. In the biochemical literature ATP stands for Adenosine Tri Phosphate. When we talk about ATP, or energy production through ATP, we mean useful energy, i.e. energy which can be used by the organism for example for muscle contraction, transport purposes, etc. Heat, a form of physical energy too, is not covered by the term ATP. One can compare this with a mechanical motor: the motor produces both useful mechanical energy and heat, which can only be dissipated in the environment.

Electrical currents are essential in the energy production through ATP.

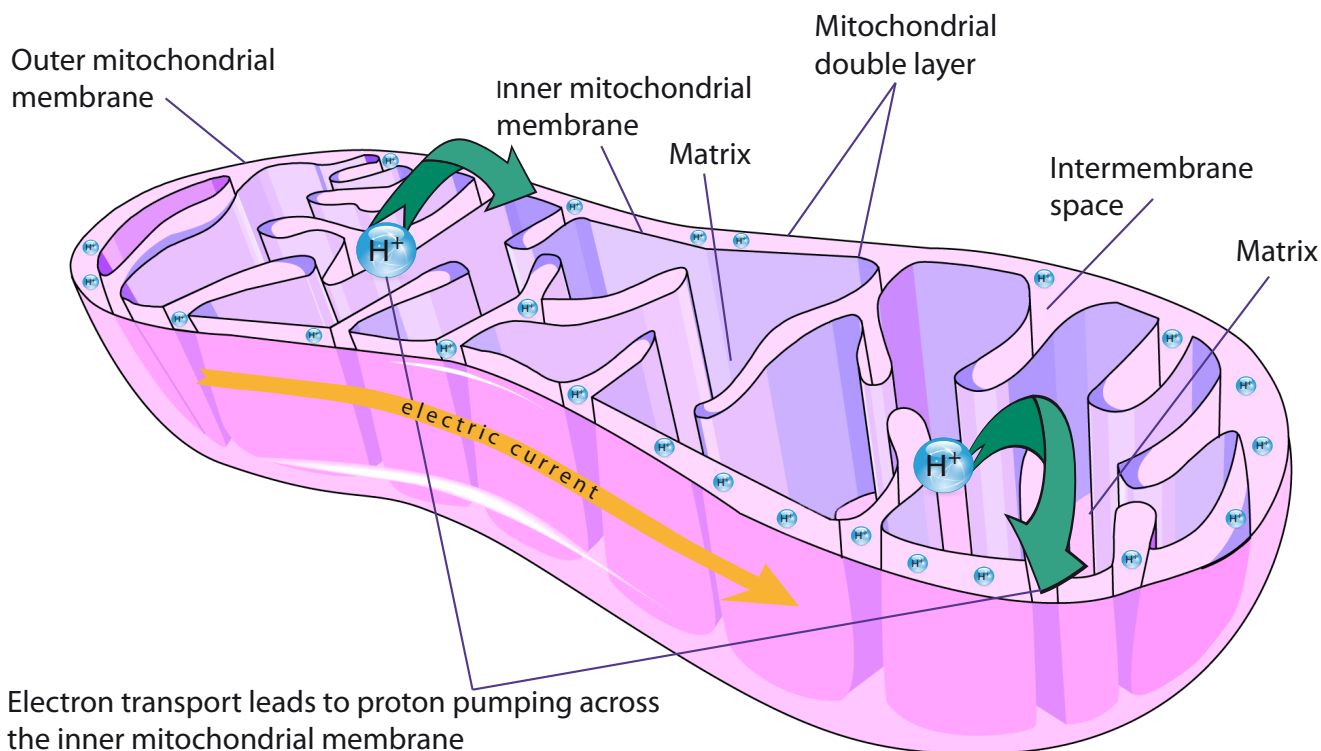
Mitochondria are a special type of organelles. The mitochondria have a double layer, composed of an outer and an inner membrane. It is interesting to note that a membrane is a double layer as well, so in fact the mitochondria have a double double layer. Please note that the DNA of the mitochondria differs from the DNA of the nucleus. As a matter of fact the DNA found in the nucleus of a cell is specific for the individual composed of those cells. On the other hand the DNA found in the mitochondria in a cell differs from the nuclear DNA found in that cell, yet is similar for humankind with some small racial differences. In the vegetable kingdom a similar situation holds for a type of organelles called the chloroplast, which also has its own DNA, different than the DNA of the nucleus of the cell of a plant.

We will first of all investigate what role electricity plays in the production of energy in the human cell.

Instead of looking at this process from a strictly chemical point of view, we will highlight the electrical side of this process. And we will see that electrical currents are essential for the production of the ATP energy. To start with, ATP production is closely related with electron transport. In current biochemical models, based on information obtained with advanced (electron)microscopes, in the human cell energy (ATP) is produced by the power of electron transport along the inner membrane of the *mitochondrion*, coupled with proton transport across the inner mitochondrial membrane.

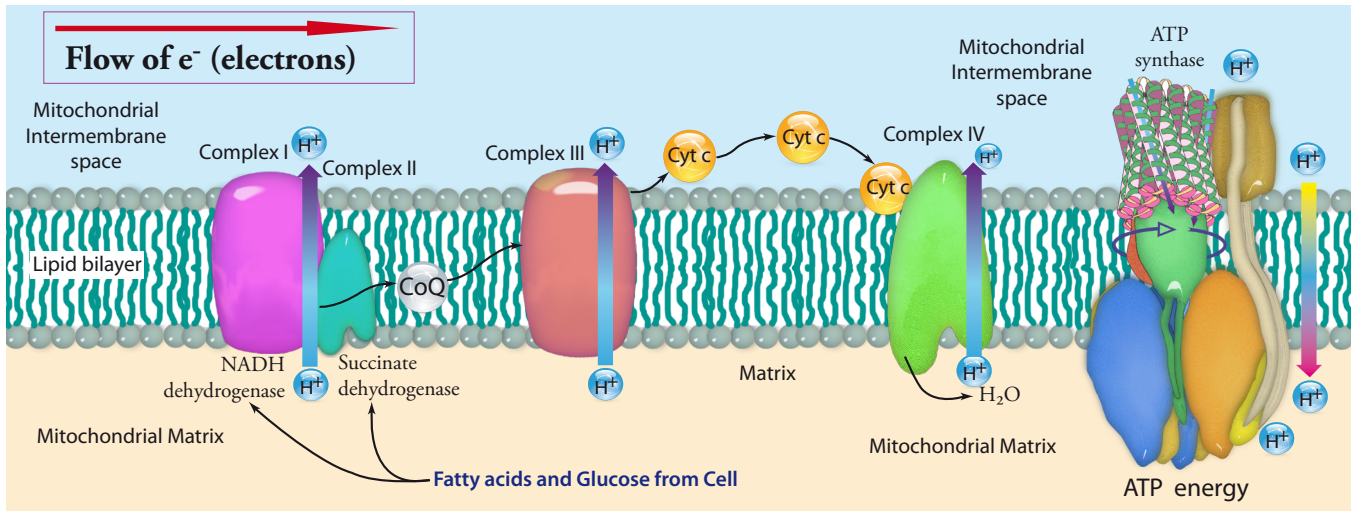
The following figures outline the ATP production process in the mitochondrion.

### Outline of the Mitochondrion



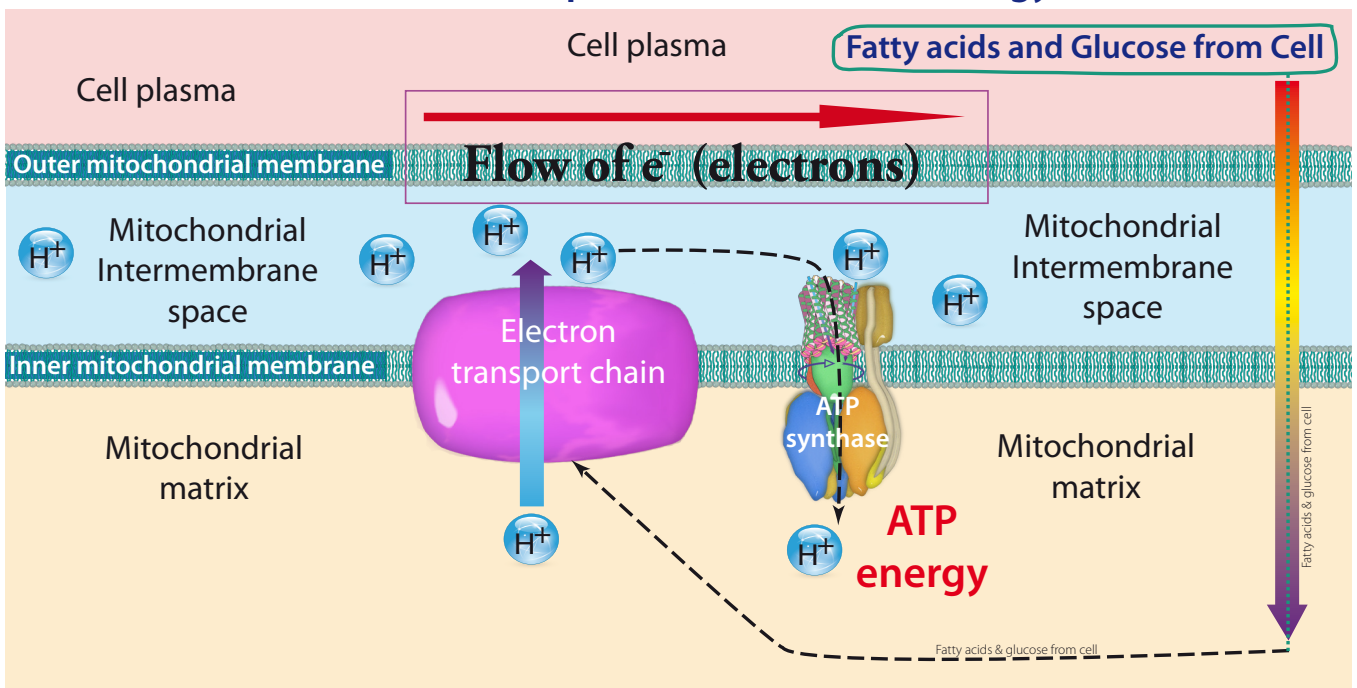


First we show the location of so called complex proteins on the inner mitochondrial membrane together with the flow of electrons. Without going into the details of all these complexes, the overall effect of the chain of electron transport reactions across these protein complexes is to move protons ( $H^+$ ) out of the matrix into the inter-membrane space. This will create an electrical gradient across the inner membrane, a so called membrane potential. The principle behind this proton/electron gradient is that the protein complexes transport electrons in only one direction, out of the inner-membrane space into the inter-membrane space, they are unidirectional.



The full electron transport chain comprises of the protein complexes I to IV, generating this electron gradient. The final step, the production of energy in the form of ATP is done by the enzyme called ATP synthase.

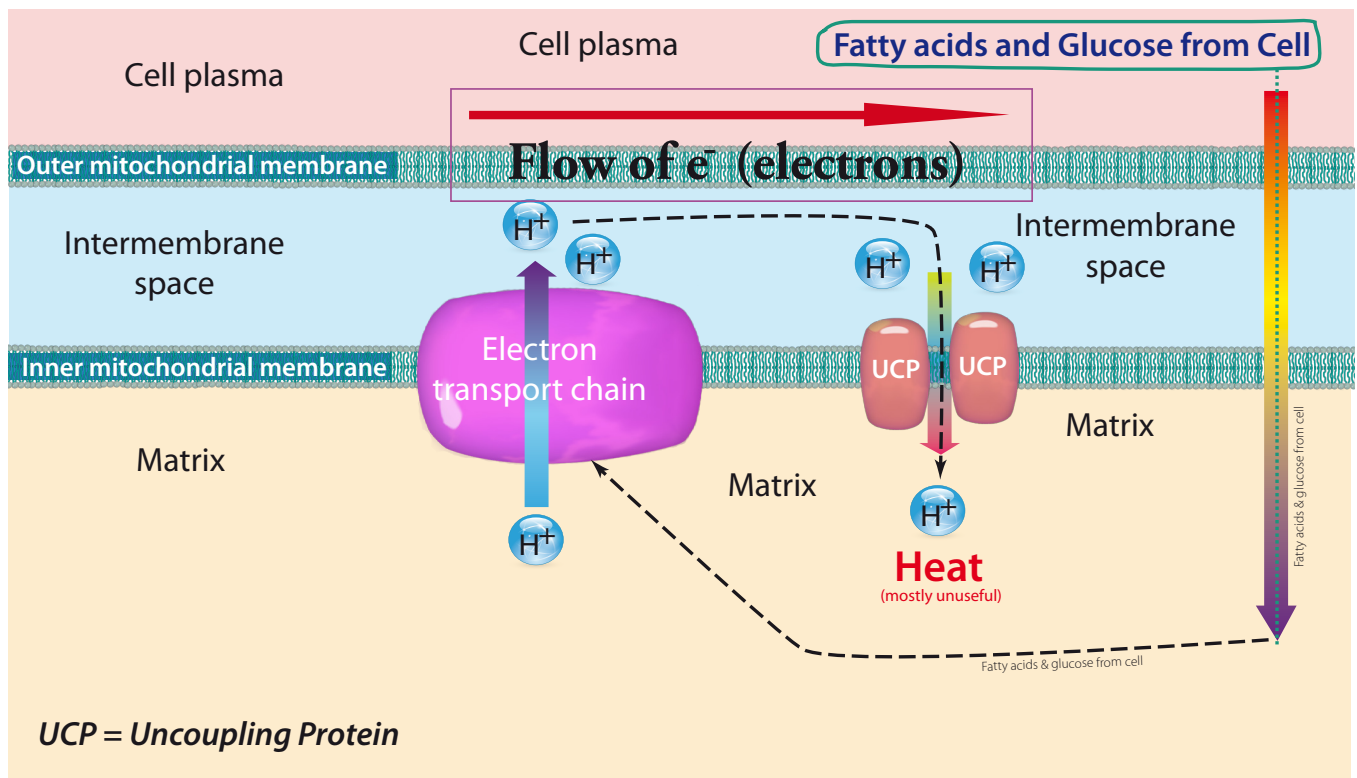
### Electrical flow and the production of useful energy - ATP



Everything in Nature is electrical in nature; life itself is electricity, but all that we have contacted and used today is that which is only physical and related to and inherent in the physical and etheric matter of all forms.

*Alice A. Bailey, Esoteric Healing, page 377*

## Electrical flow and the production of heat energy (mostly unuseful)

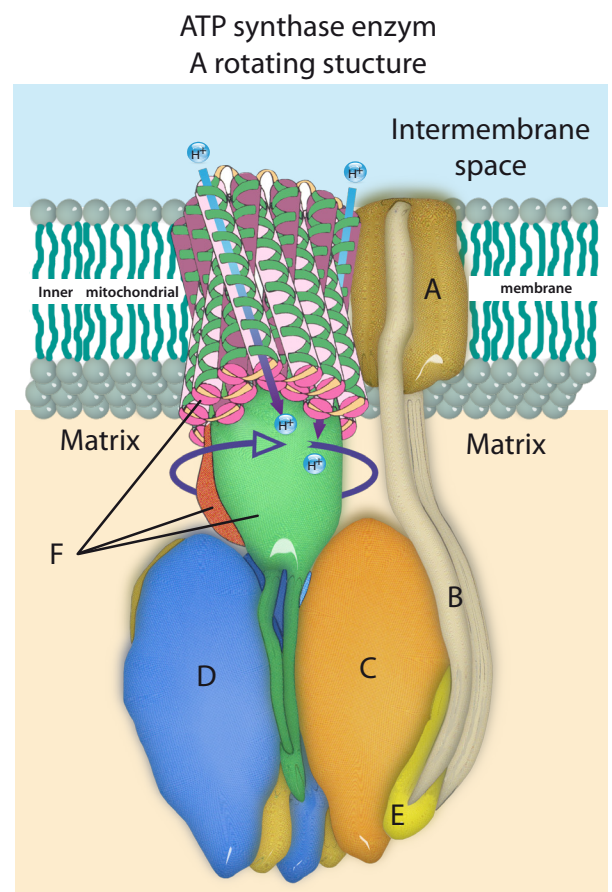


The electric gradient of protons ( $H^+$ ) is essential in the production of energy (ATP). A multi subunit membrane-bound enzyme called ATP synthase produces the actual energy in the form of ATP. This ATP synthase has a channel structure in which the protons from the inter-membrane space flow back into the inner-membrane space.

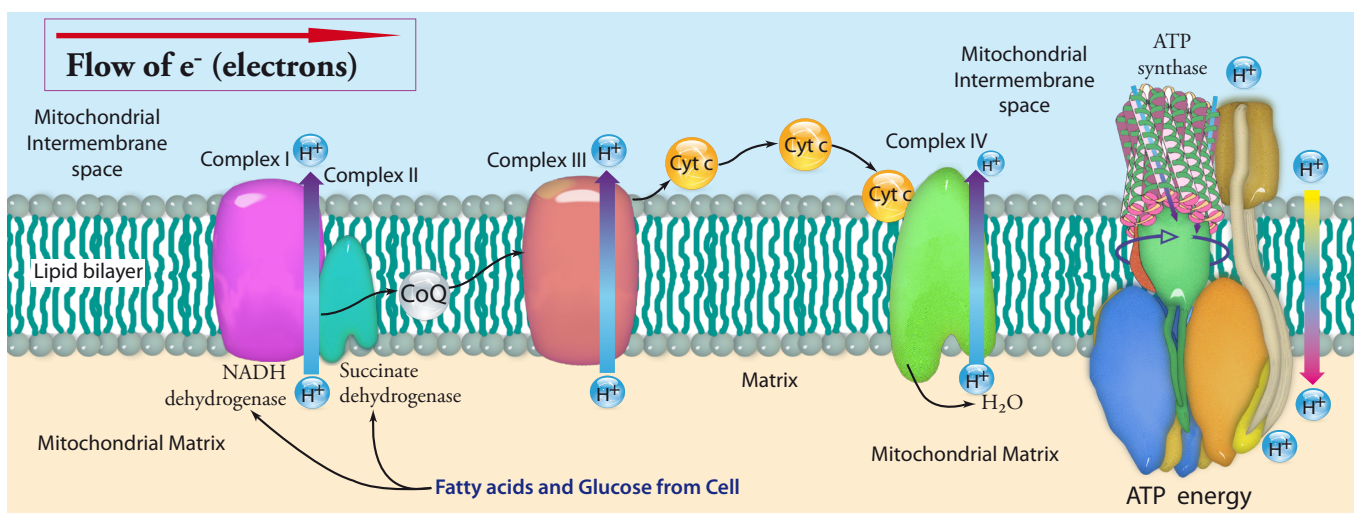
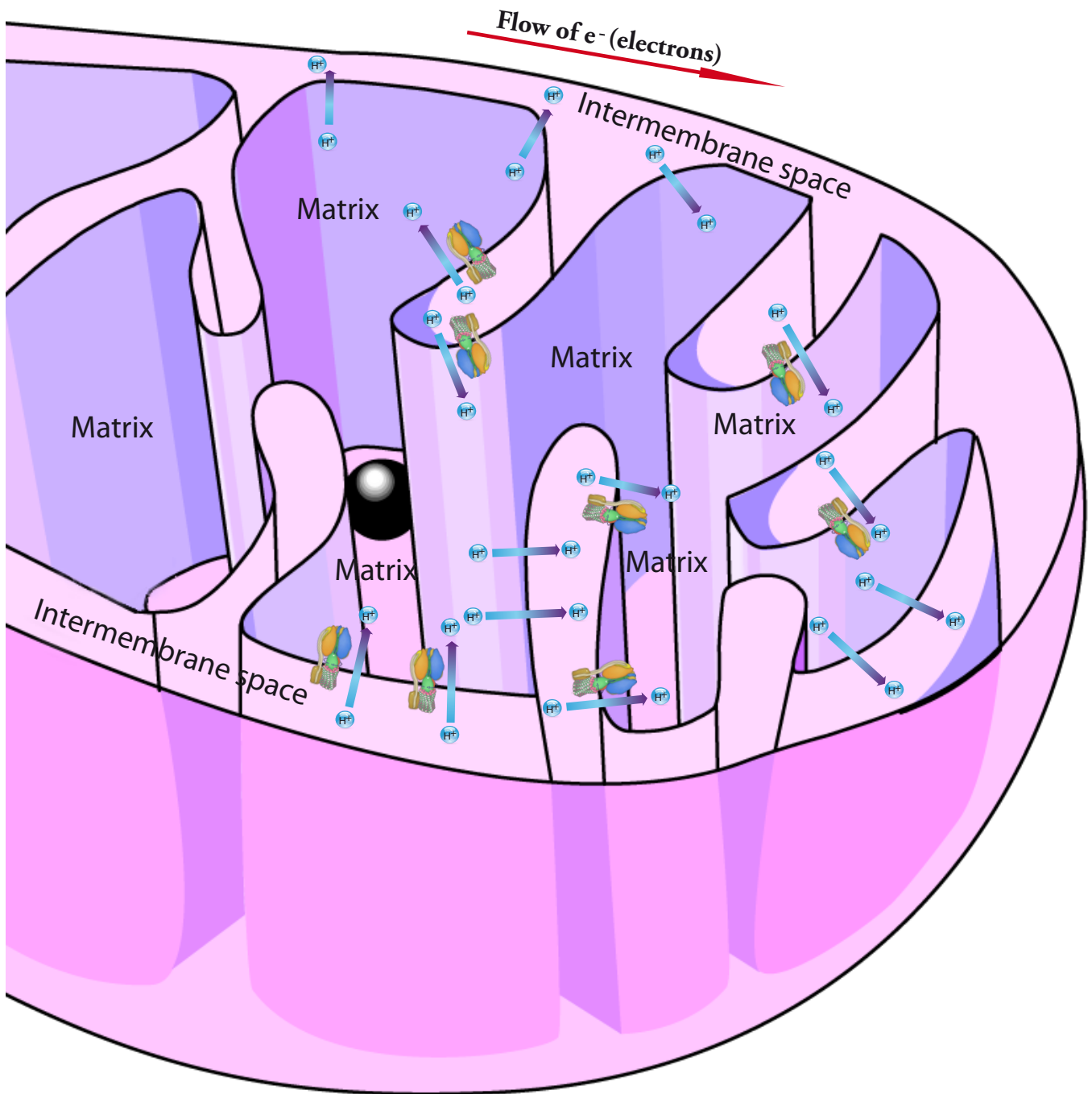
The flow of these electrons/protons back into the inner-membrane space via the ATP-ase drives a cycle of conformational changes that drive the binding of the phosphorus molecule to ADP to form the final ATP.

This model is a rotating molecular motor. A,B,C,D,E subunits constitute the static part (stator) of the motor. F subunits form the rotating part (rotor).

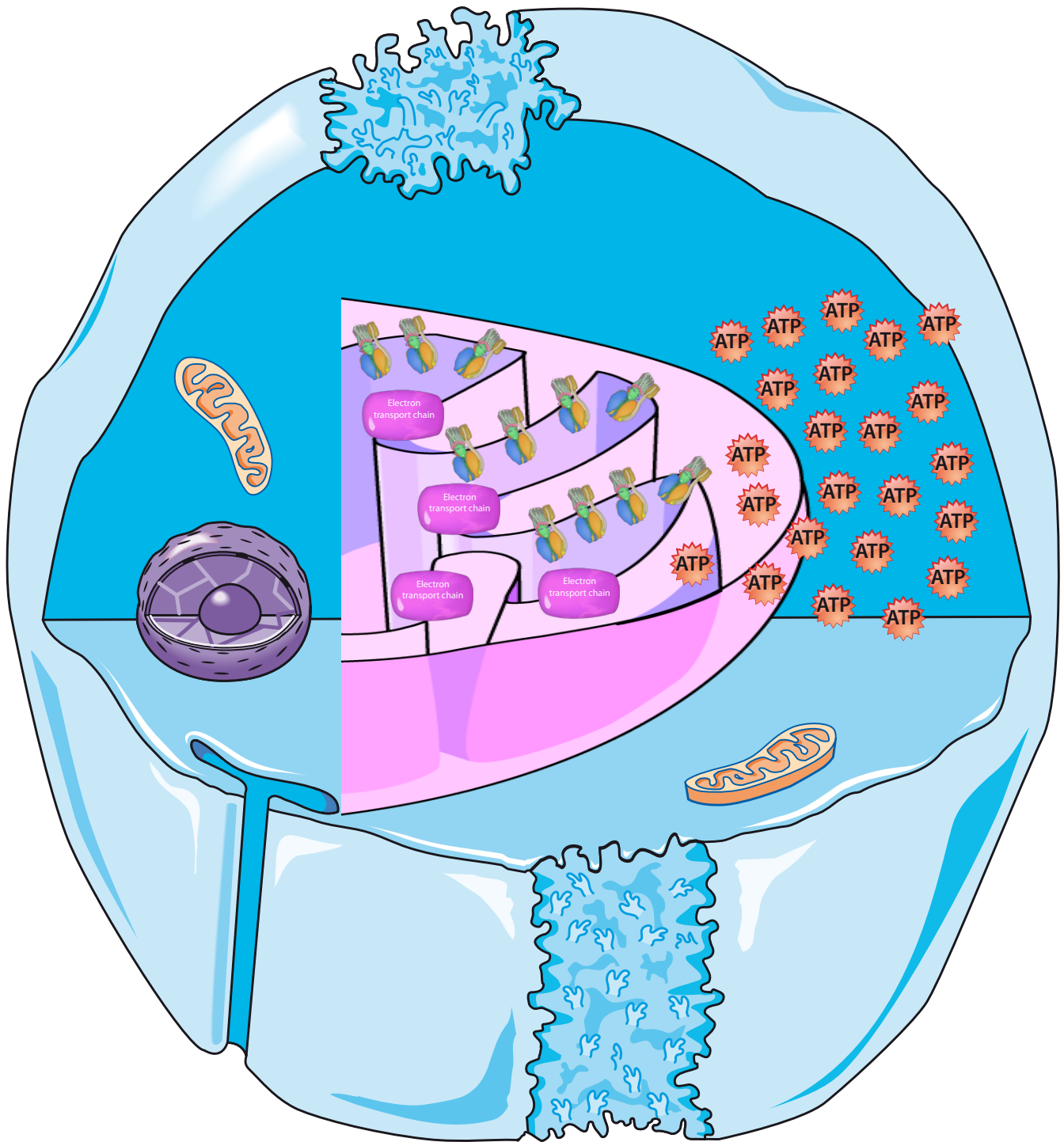
See this figure animated at:  
<http://www.towardsoneworld.eu/download/ATPSynthesis.flv>



## Detail of the Mitochondrion



## Normal ATP energy production in Cell

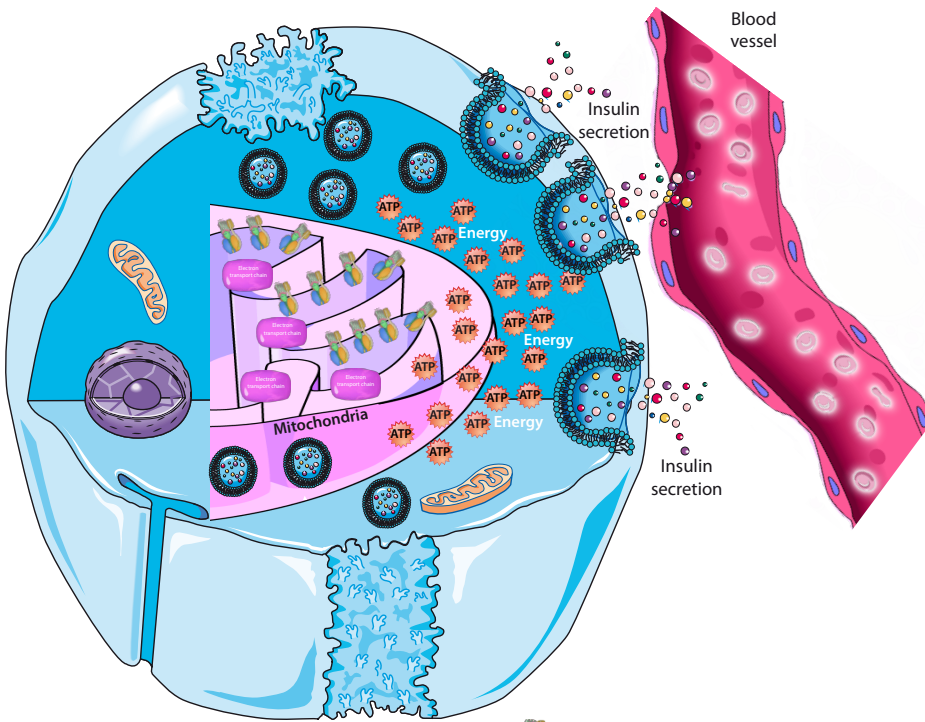


Electricity, in relation to human ills, is as yet an infant science, but it has in it the germs of the new techniques and methods of healing.



*Alice A. Bailey, Esoteric Healing, page 48*

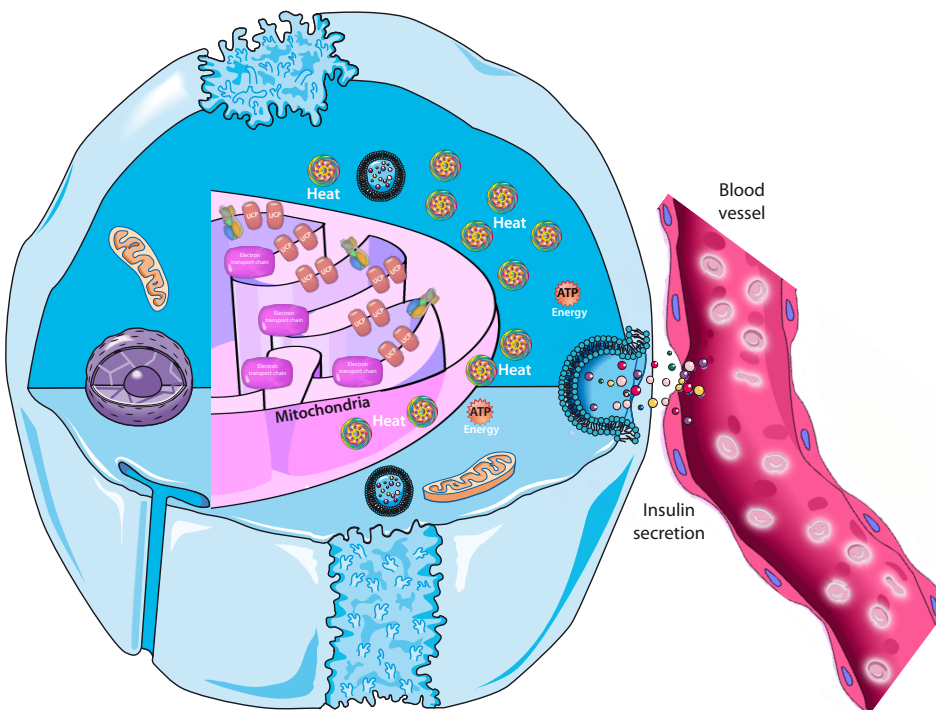


## β Cell of the Pancreas producing insulin







**Normal** function of Pancreas β cell. When needed the cell is able to emit a sufficient amount of insulin into the blood-stream.

The normal β cell with lots of ATP-synthase  produces enough ATP  energy for normal release of Insuline.

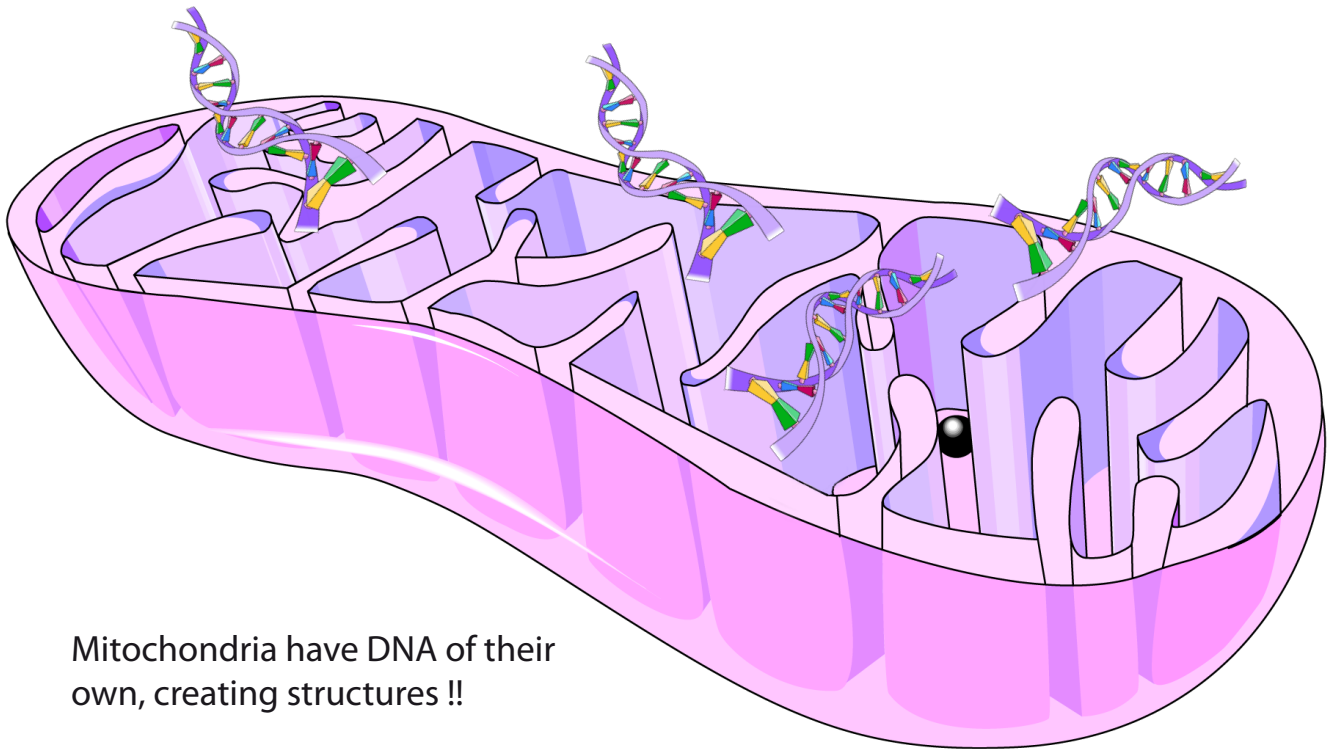


In case of the development of diabetes under insulin resistant conditions the flow of electrons/protons through the ATP-synthase is disturbed. A so called uncoupling protein (UCP) is induced during the etiology of the disease. These UCP's divert the electrons/protons away from the ATP-synthase so that the electrons/protons still flow from the inter-membrane space towards the inner-membrane space but they do not generate ATP. As a result heat is produced instead of the useful energy ATP.

The diabetes β cell has less ATP-synthase  and lots of Uncoupling Proteine  resulting in less ATP  energy and lots of heat  with decrease of Insuline secretion.

### Development of DIABETES





Mitochondria have DNA of their own, creating structures !!

- Mitochondria grow and multiply themselves through division in a coordinated process that requires the contribution of two different genetic systems: that of the organelle, i.e. the mitochondria, and that of the cell nucleus.
- From an evolutionary point of view it is suggested that both chloroplast and mitochondria find their origin in so called endosymbiotic bacteria. [In the endosymbion hypothesis eukaryotic cells started out in evolution as primitive organisms without mitochondria or chloroplasts and then established a stable endosymbiotic relation with a bacterium. This process is supposed to have occurred very early in the evolution of the eukaryotic cell, even before animals and plants separated].
- Little is known about how the nuclear and organelle genetic systems communicate in order to coordinate their contributions to the energy-organelle synthesis.
- If, for whatever reason, a functional genetic system is lost from an organelle, the cell cannot replace it. This has a detrimental effect on the function and life of the cells as well as the organism
- The type of genetic analysis which makes the yeast mitochondrial genome so accessible to study is not possible with the human cells. Hence much of what we know through genetic analysis is true for yeast mitochondria, but is supposed to hold through extrapolation for human or animal mitochondria. With modern technology the genes are known now!
- Various antibiotics - such as chloramphenicol, tetracycline and erythromycin - inhibit protein synthesis in energy organelles. Normally antibiotics neutralise or kill bacteria.

# The Bloodstream

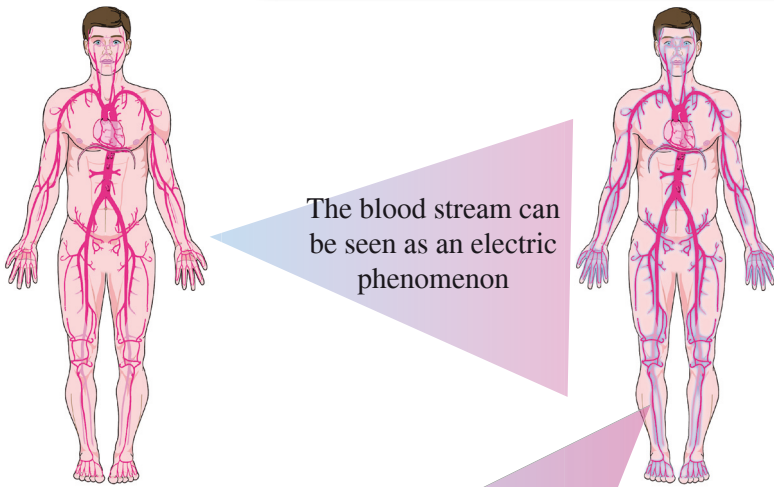
A human being in physical form needs important elements to maintain the system.

1. **Food** (on different levels). Without physical food after app. **4 weeks** the integrity of the body starts to disintegrate.
2. **Sleep** Without sleep after app. **3 days** the integrity of the body starts to disintegrate.
3. **Breath** Without breath after app. **5 minutes** the integrity of the body starts to disintegrate.
4. **Blood (circulation)** Without blood circulation after app. **20 seconds** the integrity of the body starts to disintegrate.

**The Bloodstream is of highest importance to maintain the human body.**

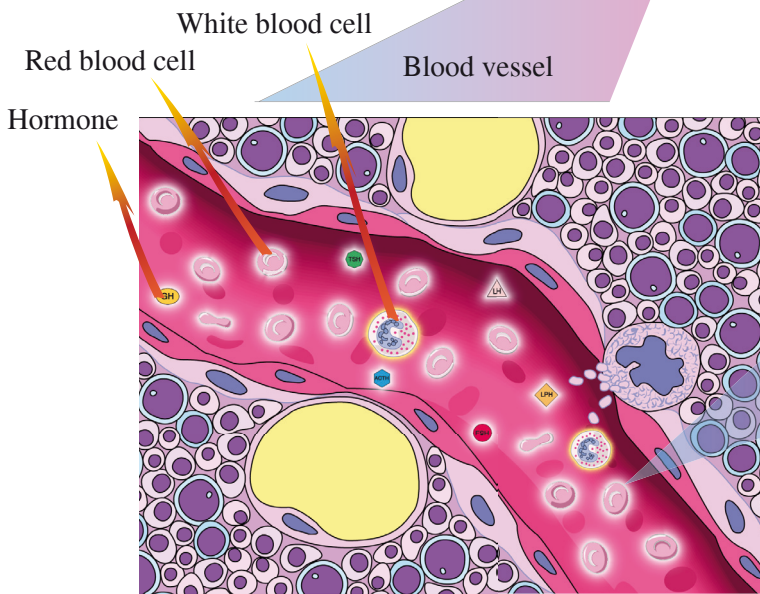
“While Kāma is the essence of the Blood, its red corpuscles are drops of electrical fluid, the perspiration oozing out of every cell of the various organs, and caused to exude by electrical action.”

*H.P. Blavatsky, Collected Writings XII, p700*



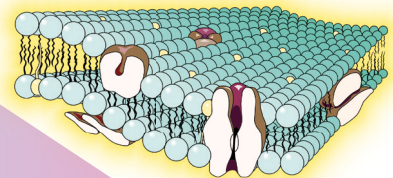
- White Bloodcells 6-9000/mm<sup>3</sup>
- Platelets 200-400,000/mm<sup>3</sup>
- Red Blood Cells 4-5 Million/mm<sup>3</sup>

The human body contains app.  
 25.000.000.000.000 Red Blood Cells  
 45.000.000.000 White Blood Cells  
 2.000.000.000.000 Platelets

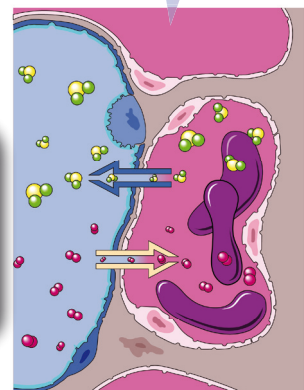


All red and white blood cells and hormones are electrically charged.

At the membrane of each cell there are per second 10.000 electrical reactions.



Cell membrane  
 Exchange of Oxygen and CO<sub>2</sub> between cells of the human body and red blood cells can be seen as an electrical activity.



“The red corpuscles represent the Fohatic energy in the Body, closely allied to Kāma and Prāna, while the essence of the Blood is Kāma, present in every part of the Body.”

*H.P. Blavatsky*

“Red corpuscles are drops of electrical fluid, the perspiration oozing out of every cell of the various organs, and caused to exude by electrical action.”

*H.P. Blavatsky*

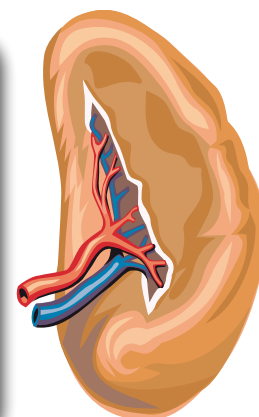
# The Spleen

The spleen, the third centre, has a specific purpose. It has its correspondence in the third or activity aspect, and in the third or Activity (Adaptability) Ray, and is the basis of all the fundamental activities of the microcosm, and of the recurring adaptations of the microcosm to its environment, to its need and to the macrocosm. It controls the selective processes of the microcosm; it takes the vibratory force and energy of the macrocosm and transmutes it for the use of the microcosm. We might call it the organ of transmutation, and—as its functions are more completely understood—it will be found that it provides a magnetic link between the conscious, thinking, three-fold man and his lower vehicles, regarding those lower vehicles as the Not-Self, and as themselves animated by informing entities. It is the life force contacting those entities that is the issue and aim.

*Alice A. Bailey, Letters on Occult Meditation page 72-73*

Anatomists are beginning to find out new ramifications and new modifications in the human Body, and they sometimes get very near a truth without quite getting hold of it. For instance, they are in error as to the Spleen, when they call it the manufactory of the white corpuscles of the Blood, for, as said, it is really the vehicle of the Linga-Śarīra. But these same white corpuscles—which are the Devourers, the scavengers of the human body—are oozed out of the Linga-Śarīra and are of the same essence as itself. They come from the Spleen, not because the Spleen manufactures them, but because they are oozed out of the Linga-Śarīra, which, as said, is curled up in the Spleen.

*H.P. Blavatsky, Collected Writings XII, p700*



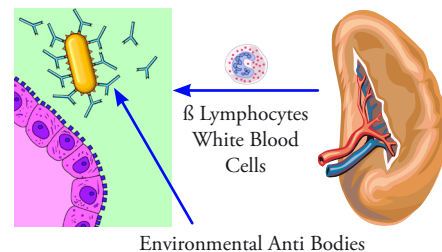
The Spleen

## CONSTITUTION OF MAN

ĀTMAN .....	<b>The SELF</b> , the light of the Divine shining in all men.
BUDDHI .....	<b>Spiritual Intelligence</b> . When manifested, this is the Inner Teacher
MANAS .....	<b>Mind</b> . When illuminated by BUDDHI, this is the higher Self. A perfect human being would have the MANAS fully developed, and it would enshrine the full light of ĀTMA-BUDDHI.
KĀMA .....	<b>Desire</b> . MANAS enslaved by KĀMA is the lower Self. In the perfected human being, KĀMA is controlled by BUDDHI-MANAS.
PRĀṆA .....	<b>Vitality</b> . The life principle. This cannot be considered to be isolated from any part of the other principles. All have their own vitality, but when enumerated as one of the seven principles, PRĀṆA is more properly considered in this relationship to the remaining two, the Astral and the Physical.
LIṄGA-ŚARĪRA .....	<b>The Astral Body</b> . The pattern around and on which is built the physical body.
STHŪLA-ŚARĪRA .....	<b>The Physical Body</b> . The body of flesh, and the outermost expression of the human being.

In traditional western medicine the White Blood Cells of the Spleen have a tremendous ability to respond to environmental influences, we call anti bodies. White Blood Cells ( $\beta$  Lymphocytes) make Immune Globulins.

The spleen acts as a filter against foreign organisms that infect the bloodstream, and also filters out old red blood cells from the bloodstream and decomposes them. These functions are performed by phagocytic cells that are capable of engulfing and destroying bacteria, parasites, and debris. Ordinarily, the spleen manufactures red blood cells only toward the end of fetal life, and after birth that function is taken over by the bone marrow. However, in cases of bone marrow breakdown, the spleen reverts to its fetal function. The spleen also acts as a blood reservoir; during stress or at other times when additional blood is needed, the spleen contracts, forcing stored blood into circulation. Recent studies have shown the spleen to be far more important than initially suspected in the fight against infection.



There is evidence that the Spleen plays an important role in cardiovascular diseases.

“The circulation of Life, Prāna, through the Body is by way of the Blood. It is the vital Principle in us, Prānic rather than Prāna, and is closely allied to Kāma and to the Linga-Śarīra. The essence of the Blood is Kāma, penetrated by Prāna, which is universal on this plane. When Kāma leaves the Blood it congeals.

*H.P. Blavatsky, Collected Writings XII, p699*

The stream of dynamic life. This is anchored in the heart. This stream of dynamic energy enters the body, via the head, and passes down to the heart, where it is focussed during the life cycle. A smaller stream of the universal energy or prana, distinctive from the individualised life force, enters the physical body, via the spleen. It then rises to the heart to join the larger and more important life stream. The life stream energises and holds in coherency the integrated physical body. The stream of pranic energy vitalises the individual atoms and cells of which that body is composed.

*Alice A. Bailey, Esoteric Healing, page 429*

See for more information about Esoteric Healing:

[www.TowardsOneWorld.eu](http://www.TowardsOneWorld.eu)