



Further explanations

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A/Effects on tissular respiration

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Under the influence of light, in the Red Blood Cells, iron becomes available for cellular respiration

(Otto Warburg, Nobel Prize winner 1931)

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As demonstrated by Otto Warburg, Nobel Prize winner:

"If carbon monoxide is added to the oxygen respired by living cells, respiration ceases, (...), but if they are **exposed to visible or ultraviolet light, respiration resumes**. By alternating illumination and darkness, it is possible to trigger and stop respiration in living cells respiring in a mixture of oxygen and carbon monoxide."

In darkness, the iron in the oxygen-carrying ferment binds to carbon monoxide, while **in light, the bond between iron and carbon monoxide is broken, making the iron available for oxygen transfer**. (...)

In this case, he demonstrated that Einstein's photochemical equivalence law is perfectly verified. **The number of FeCO₃ groups released is equal to the number of light quanta absorbed, regardless of the wavelength used.**



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Research by Professor Tiina Karu

"**The oxidase of terminal respiratory chains** in eukaryotic cells (cytochrome c oxidase) and those of prokaryotic cells (cytochrome d- and o-complexes) are recognized as **photoacceptor molecules for radiation in the range from the red to the near-infrared**. For the spectral region from violet to blue, **flavoproteins** (e.g., **NADH dehydrogenase**) are among the photoacceptors, as are terminal oxidases."

« Irradiation under appropriate parameters causes a transient reduction of cytochrome c oxidase in mitochondrial respiratory chains. **This means that a greater number of electrons will be available for oxygen reduction by the terminal oxidases of the respiratory chains.** »

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« There are cell signaling pathways between the mitochondria and the cytoplasmic membrane that are regulated by cytochrome c oxidase.

Fluctuations in cellular redox balance are involved in light signal transduction within cell signaling pathways.

Cell activation via mitochondria is recognized as a universal photobiological mechanism. “

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“At least five types of reactions can occur with the participation of photo acceptor molecules after their electronic excitation:

- First, changes in redox properties and an acceleration of electron transfer within cytochrome c oxidases.
- Then, the release of nitric oxide from the catalytic center of cytochrome c oxidase.
- Auto-oxidation of O_2 with the formation of O_2
- Photodynamic action (formation of O_2 with the participation of components of the respiratory chain)
- Finally, changes in biochemical activity, induced by the local and transient heating of the absorbing chromophores.”

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The main physical and/or chemical changes induced by light in photo-acceptor molecules are followed by a cascade of biochemical reactions within the cell that no longer require activation by light and can therefore occur in the dark (light signal transduction and chain amplification).

These reactions are associated with changes in cellular homeostatic parameters. The fundamental step here is most likely the alteration of the cellular redox potential.

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B) Therapeutic Mechanisms

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- **Restoration of the transmission of biochemical information** between synapses and mitochondria, which is impaired by the pathology;
- **Energy enhancement** of defense systems;
- **Neutralization of virulence**, primarily against viruses;

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- **Tissue desensitization** : photonic therapy, by its principles and definition, is "des-allergenic," given that allergy is simply an excessive defense reaction to a disruption of normal physiology;
- **Detoxification** : photons contribute to restoring the health of tissues according to their dissipative structural capacity and help promote the elimination or destruction of accumulated toxic elements;

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- **Tissue regeneration:** This occurs as described previously. It is not a return to the initial static state, but rather the establishment of a new tissue health state within a thermodynamic framework;
- **Functional reactivation** of devices and systems;
- **Rehabilitation of tissue respiration:** In any pathology, there is negative interference with tissue respiration, as this is the initial disturbance resulting from the hypoxia and acidosis induced by the pathology;

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- **Reactivation and normalization of energy information**, in accordance with the theories of Schrödinger, Fröhlich, and Prigogine.
- **Structural and mechanical repair;**
- **Anti-infectious, antiviral, and antiparasitic** action;

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- Antispasmodic, neuroleptic, hypnotic, and **analgesic** effects.
- **Photons treat and heal. They prevent disease and maintain health.**
- The photon transforms the physician into an active therapist. It does not erase the clinical anatomy: it validates it. It does not eliminate chemical medication: it locates and enhances it.

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- To paraphrase Hippocrates, we could say: **"The physician treats, the photon heals."**

With the arrival of photons, the available electrons will form "dissipative structures," as Ilya Prigogine explained, thanks to photon energy.

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Dissipative structures represent the propagation of energy supplied at specific locations throughout a system. It means **the energy becomes delocalized** (hence, dissipative).

"Photons can be transmitted without energy loss over long distances through cellular tissues with greater efficiency than light conductors created by this technique."

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"When a complex system is far from equilibrium, small islands of coherence in a sea of chaos have the capacity to bring the entire system to a higher level of order. »

Ilya Prigogine

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One of the main points is the restoration of the autonomic nervous system's functional equilibrium. This new state of equilibrium coincides with an optimal state of tissue respiration. And the excellence of tissue respiration is manifested by excellent redox expression.

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c) At the molecular level

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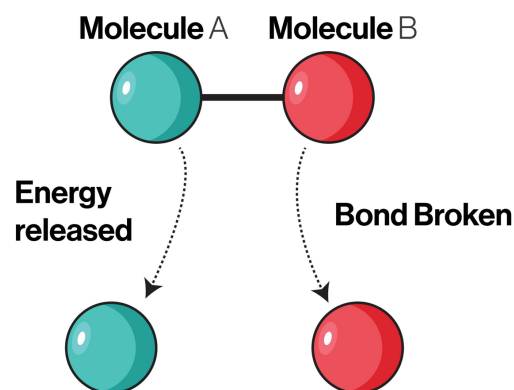
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During chemical reactions, chemical bonds are broken within the reactants present, and new bonds are formed in the reaction products.

When the total energy of the bonds in the products differs from that of the reactants, there is a change in free energy (available energy that can be used to do work). This is the **free energy (ΔG)**.

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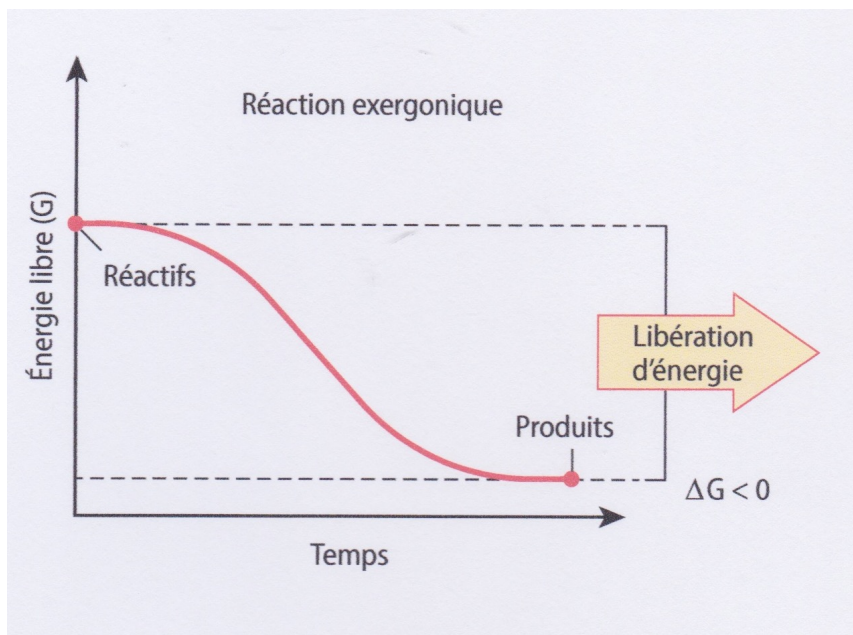
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Exergonic reaction

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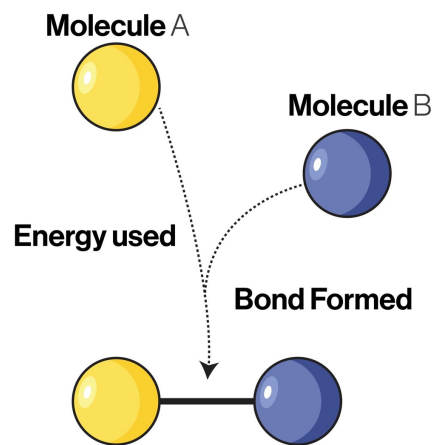
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If the ΔG is **negative**, the reaction will occur spontaneously: this is an exergonic reaction. It characterizes **catabolism**.

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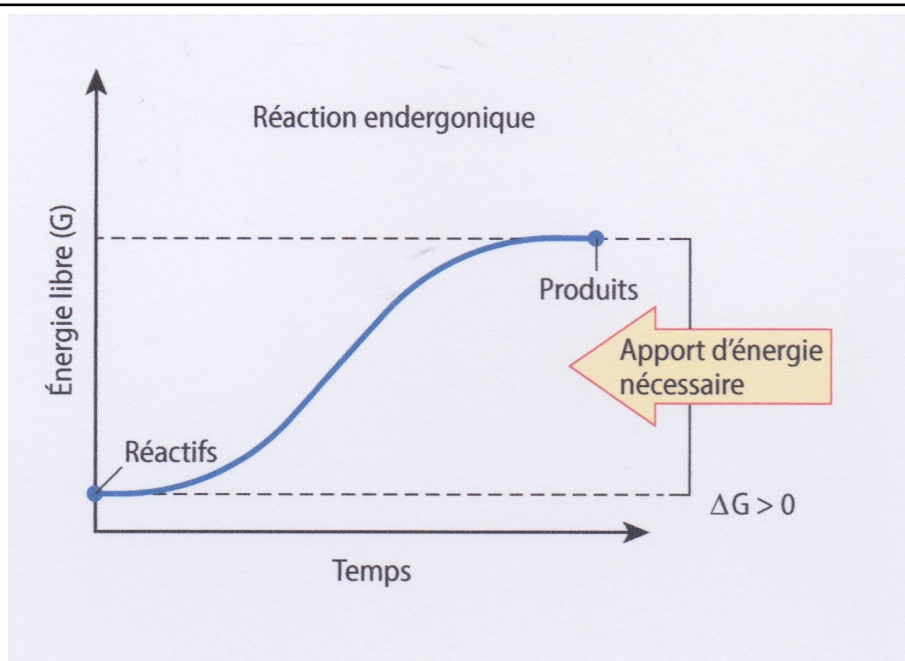
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Endergonic reaction

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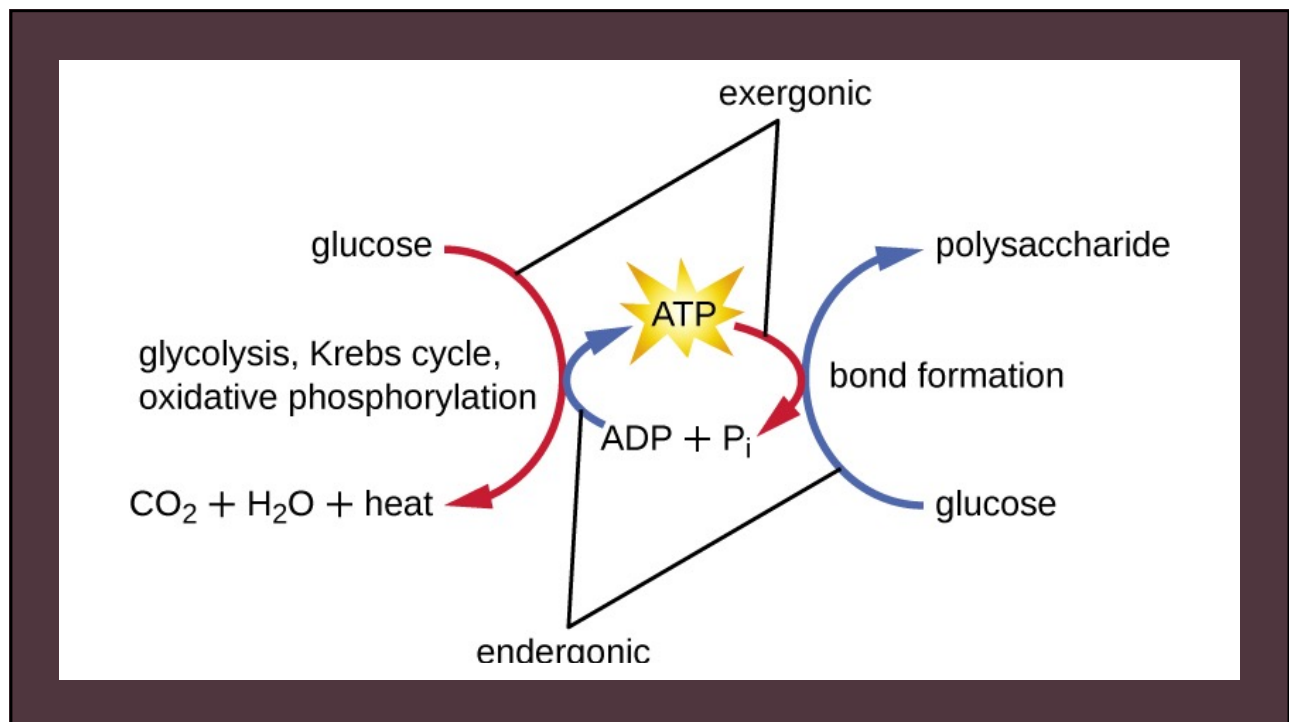
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If ΔG is positive, these processes require additional energy input to occur because they cannot happen spontaneously. These are endergonic reactions. An example is **anabolism**.

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Cells use ATP to carry out exergonic and endergonic reactions. The thermal bath is the essential environment for cell life. **At 36.6°C, all the components of this thermal bath circulate, including electrons. All the elements and radicals that need to be used are dissolved at this level.**

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It constitutes a constant reservoir of electrons in a steady state of vibration, which can be mobilized for functional or metabolic purposes—a natural and rhythmic phenomenon that photonic medicine utilizes.

It is the physiological reservoir for supplying tissular respiration.

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In the event of a functional disorder or pathology, **due to energy deficiency**, chemical reactions become more difficult to carry out. This results in the **accumulation of waste products, a worsening of local hypoxia, and an increase in the acidosis resulting from the disruption.**

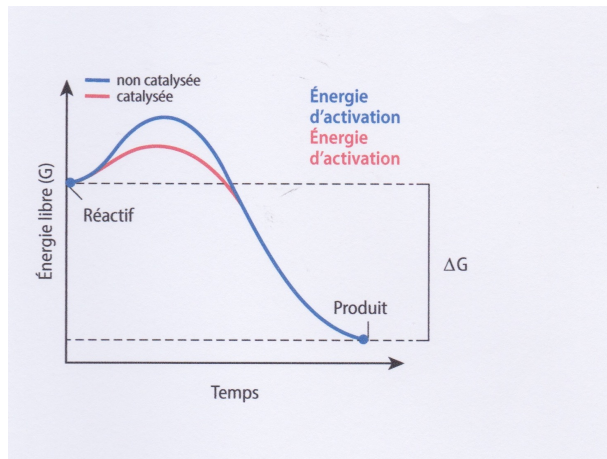
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Photonic input, by making possible an **energetic and functional reorganization of the thermal bath**, will allow, through the energetic input of photons, **a relaunch of the deficient enzymatic activity, by lowering the activation energy necessary for its realization** (cf. next slide)

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D/ At the submolecular level

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Professor Albert Szent-Györgyi, through his discoveries concerning the citric acid cycle, which earned him the Nobel Prize in 1937, laid the foundations of molecular medicine. But he had the intuition that there was something further than molecular level

So he went to Princeton to study quantum physics with main physicist at that level, and in 1957 published "Introduction to a submolecular biology"

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As a result of this pioneering work, he concluded:

"The human body is nothing other than an automatic molecular machine, in which not gears but molecules whirl and are responsible for all bodily functions. However, it is possible to go beyond the molecular level to reach the sub-molecular level, **the electronic level.**"

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While the thesis of molecular medicine is that all diseases begin at the molecular level, and therefore, necessarily, that all cures must occur at this same molecular level, it has become possible to go further and reach the sub-molecular level.

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"All diseases result from an unfavorable distribution of electrons within the human body, and therefore, necessarily, all cures must correspond to a favorable modification of the poorly distributed electron density." Albert Szent-Györgyi

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The body's electromagnetic mass is infinitesimal (approximately 25 grams for an individual weighing 100 kg) and yet fundamental.

The role of photons, the electromagnetic constituents of Light, has no other purpose than to reinforce this electronic mass and put it back in fighting order.

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