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## RESEARCH ARTICLE

# APPLICATION OF INTRACELLULAR ENZYMES IN CHRONIC DISEASES

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### ABSTRACT

A remark at the outset: one should distinguish between digestive enzymes (formerly called ferments) and intracellular enzymes. The former have been in use for a long time; they include lipases, amylases, peptidases or the well-known bromelain. They work excellently in the intestine, but only partially pass into the blood and not at all into the body cells. They "crack" larger molecules and in this way "clean" the intestinal contents and to a limited extent the blood. Beneficial, of course. However, intracellular enzymes have far greater tasks; without them there is no life. The entire intermediary metabolism needs them and consists of them, i.e. energy production towards ATP (together with coenzymes) as well as protein production and the monitoring of DNA functions. Without them, the body's cells would be unable to function. At any moment, mainly as a result of oxidative and nitrosamine stress, thousands of DNA changes occur, the repair of which is the responsibility of enzymes.

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## INTRODUCTION

### The Theory

Wikipedia: "Enzymes are divided into seven enzyme classes according to the reaction they catalyze:

**EC 1:** Oxidoreductases, which catalyze redox reactions.

**EC 2:** Transferases, which transfer functional groups from one substrate to another.

**EC 3:** Hydrolases, which cleave bonds using water.

**EC 4:** Lyases that catalyze the cleavage or synthesis of more complex products from simple substrates, but without consumption of adenosine triphosphate (ATP) or another nucleoside triphosphate (NTP).

**EC 5:** Isomerases that accelerate the conversion of chemical isomers.

**EC 6:** Ligases or synthetases that catalyze addition reactions using ATP (or another NTP) [11]

A reverse reaction (cleavage) is usually energetically unfavorable and does not occur.

EC 7: Translocases, the transport of substances at or through cell membranes.

Some enzymes are capable of catalyzing several reactions, some of them very different. Without enzymes, most biochemical reactions in living organisms would take place at negligible rates. As with any spontaneously occurring reaction, the free enthalpy of reaction ( $\Delta G$ ) must be negative. The enzyme accelerates the setting of the chemical equilibrium - without changing it. The catalytic efficiency of an enzyme is based solely on its ability to lower the activation energy ( $\Delta G^\ddagger$ ) in a chemical reaction: this is the amount of energy that must initially be invested to get the reaction started. During this, the substrate is increasingly altered, assuming an energetically unfavorable transition state. The activation energy is now the amount of energy required to force the substrate into the transition state. This is where the catalytic action of the enzyme comes in: Through non-covalent interactions with the transition state, it stabilizes it so that less energy is required to force the substrate into the transition state.

The substrate can be converted into the reaction product much more quickly, since a path is "paved" for it, so to speak."

**The Realization:** This is a biodynamic phenomenon, which in its magnificence is familiar to only a few. Medically active people learn this as a theory and soon forget it again. A therapeutic application was not known until about 10 years ago, because there was as nature-identical industrial production only that of individual enzymes. However, the use of single enzymes as well as coenzymes (NADH, Q10 etc) is not logical, because the intermediary metabolism works like a cogwheel structure. If you increase the concentration of individual components, the whole thing stutters or falters. Only the supply of as many components as possible, including the substrates, enables a smooth improvement of the processes. Since lesions in enzyme functions are involved in almost all diseases, enzymopathy (accompanied by mitochondriopathy) can be called a basic pathology. Consequently, enzyme therapy is a basic therapy and not limited to some diseases. There are intake protocols for over 300 defined pathologies.

**"Complementary Enzyme Therapy**  
<https://en.wikipedia.org/wiki/Enzymology>: Complementary enzyme therapy is a set of treatments used to support traditional medical treatments for different types of pathologies, such as tumors, autoimmune diseases or chronic diseases like multiple sclerosis. The use of biodynamic components favors cellular metabolic reactivation and obtains excellent results. The biodynamic components are able to maintain a cellular stability defined as "allostatic" during pathological processes and are able to provide the necessary energy for intracellular support. In countries such as Germany or Austria, where the use of biodynamic components to support many pathologies is common, it has been found that complementary enzymatic therapies can open new scenarios for the treatment of these pathologies, arriving from biochemistry (and therefore from the study of the cell) also in the solution of the pathology itself. For example, some studies on cardiovascular pathologies showed that the use of biodynamic components allowed the reduction of carotid plaques and a reduction in fatty liver and cholesterol levels. Other studies showed how it is possible to improve the quality of life and increase the body weight of patients undergoing advanced lung cancer chemotherapy. Usually, weight loss in cancer patients is caused by cancer cachexia and chemotherapy-induced nausea and vomiting. These observations were considered by Giuseppe Cotellessa, researcher and inventor of an original physical-mathematical method, patented by ENEA on the basis of important practical applications for the benefit of humanity.

He mentioned the possible effect of the biodynamic components on the regression of lung cancer and the evaluation of the patient's quality of life. Moreover, the effects of the treatment with biodynamic components were also studied from a metabolic point of view. The data collected during the experiments would indicate that the biodynamic components increase the performance of the normal cells in the body and improve the patient's quality of life. On the contrary, their activity would cause the energy in the cancer cells to be reduced, slowing down the progression of the disease. It could be deduced that these new technologies could help in the treatment of cancer patients, not as antitumor agents, of course, but as a useful strategy to improve the quality of life by reducing the unwanted symptoms of chemotherapy."

**Effects on Cancer Cells:** In case of cancer the enzymes are not working as cytotoxic agents, but they are resocializing the lactate metabolism of cancer cells, which find back to their original oxygen metabolism. Genetic diseases are also a field of activity for enzymes, since the normal endogenous repair of DNA is their responsibility. Genetic aberrations and DNA breaks can be repaired or even normalized by enzymes. Italy seems to be the country that is moving forward in this regard [www.citozeatec.ch](http://www.citozeatec.ch). The nature-identical industrial production of the "biodynamic components" as an imitation of what takes place inside the body's cells is taking place in Milano ([www.citozeatecsrl.it](http://www.citozeatecsrl.it)).

**The future:** If we look at the future of medicine, pharmacology as the use of substances foreign to the body without the use or addition of the self-healing powers will not have a promising future. Their more and more expensive means cannot be paid for in the foreseeable future either. On the other hand, the future belongs to the real application of the sciences of biophysics and biochemistry. The former is a typical subject of the Societies for Energy and Information Medicine (e.g. [www.dgeim.de](http://www.dgeim.de)). Biochemistry as part of orthomolecular medicine cannot be better realized than with the enzyme therapy described here ([www.drdoepp.org](http://www.drdoepp.org)). Recently, a scientific publication appeared on successes of enzymes also in multiple sclerosis (<https://www.mdpi.com/2076-3271/9/3/52>). This shows that there seem to be almost no limitations for enzymes. In particular, the autoimmune processes of many people that we are facing in Covid-19 seem to respond positively. We have a wide field ahead of us here.

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