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Therapy with Intermediary Catalysts

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Abstract

Any organism's metabolism must provide a constant supply of energy to maintain vital functions. Consequently, disturbances in energy metabolism can impair energy supply. Life can be defined as an interaction between energy and matter in a watery environment at relatively low temperatures. Catalysts speed up the biochemical processes on which life depends so that these processes are coordinated at the right time. This article explores the significance of catalysts in antihomotoxic therapy.

Matrix Substances

In all organisms, suitable energy must be introduced in the form of food, and unsuitable energy must be eliminated. The resulting unstable equilibrium, different from a thermodynamic state of equilibrium, is maintained throughout the organism's life span.[1]

Catalysts are often able to accelerate reactions to an impressive extent. Since a single enzyme molecule can convert more than 10,000 substrate molecules per second, it is not unusual to find that catalysts increase reaction speeds by a factor of 10^6. When the reaction is completed, the catalyst is unchanged and immediately available to catalyze the same reaction for the next molecule. This process is called catalysis. When the reactions take place in biological systems, we speak of biocatalysts. Activators may further enhance catalysis while so-called poisons (homotoxins) reduce it or even block it entirely.

Effective catalysis requires suitable substrates between and within cells. Cellular responses depend on information that reaches the cells only via the intracellular space, or "matrix". The efficacy of extracellular and intracellular catalysts is determined by the dynamic structure of the matrix and its regulation ("ground regulation"). In all cells and cell associations, matrix components such as high-polymeric, sugar-protein compounds and sugar complexes (proteoglycans/glycosaminoglycans), structural proteins (collagen, elastin), and connective glycoproteins (e.g., fibronectin) form a molecular sieve. The composition of this sieve is essentially determined by the fibroblasts, which synthesize matrix substances with the help of hormones, neurotransmitters, metabolites, cytokines, and others. From the therapeutic perspective, catalysts can also be included in this category.[1] Inductors and activators of the intermediary metabolism are often called intermediary catalysts.

The Citric Acid Cycle and Its Significance for Catalyst Therapy

Metabolism revolves around the citric acid cycle, which is the primary pathway of catabolizing pyruvate or acetyl-CoA. The citric acid cycle is a fundamental, self-contained reaction pathway in all plant, animal, and human cells. The products of carbohydrate metabolism, oxidative fatty acid breakdown, and post-transamination protein metabolism feed into this cycle, which also provides important building blocks for synthesizing processes in the organism. In connection with the respiratory chain, the citric acid cycle is also the most important source of energy for metabolism. It supplies oxygen for biological oxidation and is therefore closely linked to cellular energy metabolism.[2–4]

The building blocks of the citric acid cycle are citric acid, cis-aconitic acid, oxalosuccinic acid, α-ketoglutaramic acid, succinic acid, fumaric acid, malic acid, and the salt sodium oxaloacetate (Figure 1). (In the plant and animal kingdoms, some organic acids, such as the malic andd citric acids in fruits, are found outside the citric acid cycle.) Noxae may inhibit the enzymes that mediate the transformation of one organic acid into the next in the citric acid cycle (e.g., competitive, end product, or substrate inhibition). By altering the concentration of individual acids, such blockages can trigger reactions or secondary blockages that cause disease symptoms in various tissues (e.g., glycogen-storage disease and other storage diseases).

With regard to therapeutic issues, catalysts are effective only in the right environment. In regulatory cycles and metabolic chains, a suitable milieu involves not only hydrogen ion concentration (pH) but also the availability of appropriate substrates and cofactors. These cofactors include trace elements (metallic ions that form metal-enzyme complexes called metalloenzymes) and vitamins. Enzymes are activated, i.e., become capable of performing specific functions, only when the appropriate cofactors are present.

In therapeutic application, the concept of intermediary catalysts is defined more broadly than in physiological contexts and includes not only catalysts in the strictest sense (enzymes) but alo related substrates, intermediary products, and cofactors (Tables 1 and 2). Thus, the following groups of preparations are available for therapeutic use:

- Individual catalysts (enzymes)
- Individual coenzymes (cofactors)

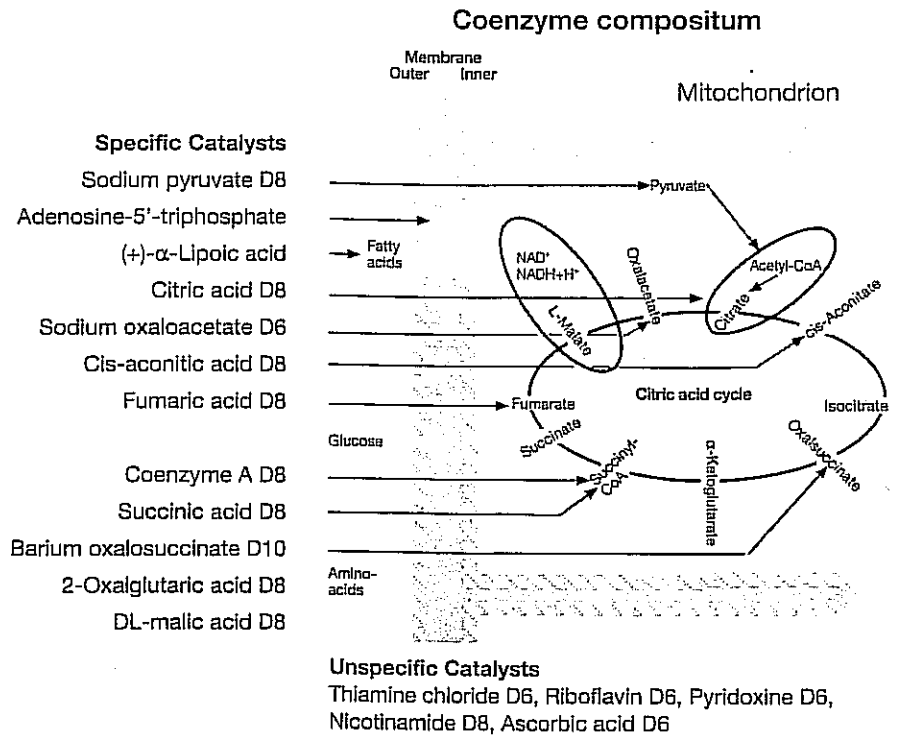

Figure 1: Specific catalysts in Coenzyme compositum and their positions in the citric acid cycle[2].

Coenzyme	Site of activity/function
Coenzyme A	Citric acid cycle
Cytochrome b, c, a	Respiratory chain
Coenzyme Q (ubiquinone)	Respiratory chain
Adenosine triphosphate (ATP)	Energy transfer
Phosphatadenyl sulfate	Sulfate incorporation
Cytidine triphosphate (CTP)	Phospholipid synthesis
Uridine triphosphate (UTP)	Glycoside synthesis
S-Adenosyl-L-methionine	Methylation

Table 1: Coenzymes and their functions.

Vitamin	Coenzyme
Nicotinic acid	Nicotinamide adenine dinucleotide (NAD); Nicotinamide adenine dinucleotide phosphate (NADP)
Vitamin B_2 complex	NAD
Riboflavin (Vitamin B_2)	Flavin mononucleotide (FMN)
Thiamine (Vitamin B_1)	Thiamine pyrophosphate (TPP)
Pyridoxine (Vitamin B_6)	Pyridoxal phosphate
Cyanocobalamin (Vitamin B_{12})	Coenzyme B_{12}
Ascorbic acid (Vitamin C)	Ascorbate
Biotin (Vitamin H)	Biotin
Phylloquinone (Vitamin K)	Phylloquinone

Table 2: Vitamins essential to coenzymes.

- Individual intermediary products
- Enzyme mixtures
- Combinations of catalysts

Trace elements or metallic ions are necessary for the activation and proper functioning of catalysts. Therapeutic use of catalysts in combination with intermediary products is indicated for:

- Deficiencies in multiple locations on metabolic chains
- Suboptimal production by cell organelles
- Membrane transport disorders
- Catalysts misdirected as a result of congenital disorders

One or more of these indications is present in:

- General cell-matrix dysfunction (impregnation and degeneration phases)
- Mitochondrial defects
- Lyosomal defects

General Biochemical Foundations of Intermediary Catalyst Therapy: Stimulating Blocked Enzyme Systems

Therapy with potentized citric acid cycle factors is especially important not only because it can target and eliminate specific blockages (e.g., pyruvate breakdown accompanied by significant slowing of final oxidation) but also because it reactivates specific steps in the cycle and simultaneously influences cellular respiration.[2]

Many enzyme reactions depend on magnesium and/or manganese ions as additional activators. For example, all kinase reactions require magnesium for phosphate transfer, while alkaline phosphatases are activated by magnesium and manganese ions, and many peptidases are activated by manganese ions. Manganese ions can substitute for magnesium ions in many cases. Because of the importance of inorganic phosphate, targeted therapy with intermediary citric acid cycle catalysts can be rationally and effectively preceded by, or combined with, injections of magnesium and manganese phosphates.

Intermediary catalyst therapy can intercede directly in the central pathological process. Intermediary catalysts influence reactions in specific ways through central and causal regulatory mechanisms. The concept of feedback inhibition by an intermediary product plays an important role. The reaction resumes only when the products that must be broken down are eliminated or diluted, as happens in inflammation when oedema occurs. Each substrate, especially in diluted form, can stimulate synthesis of suitable enzymes. Conversely, a heavy influx of substrates can retard the production of the enzymes needed to metabolize them.[5]

In many illnesses, individual enzyme functions are disturbed; consequently, the entire regulatory mechanism fails. Hence, in accordance with the Arndt-Schulz law of reversed effects, metabolites that inhibit or stimulate enzymes can be used therapeutically to promote production of the relevant enzymes. A byproduct that can not be processed further because the necessary enzyme system is blocked can be used therapeutically to induce synthesis of the blocked enzyme system.[4]

This therapeutic approach is especially significant in cellular phases, which may entail damage to the respiratory chain or final oxidation in the mitochondria. Both the enzyme systems involved and the function of the mitochondria have long been known. Both the citrate cycle and oxidative phosphorylation are compartmentalized in the mitochondria, where the energy cells' need for survival can be made available via energy-rich phosphates.[6-8]

The presence of free thiol groups is typical of the activity of many substances such as coenzyme A. Enzyme inhibition occurs when thiol groups (or other such groups active in many enzymes) are blocked or displaced by other substances. In other instances, enzyme inhibition is due to blockage or deficiency of trace elements. Such blockages also lead to progressive disease states.[9]

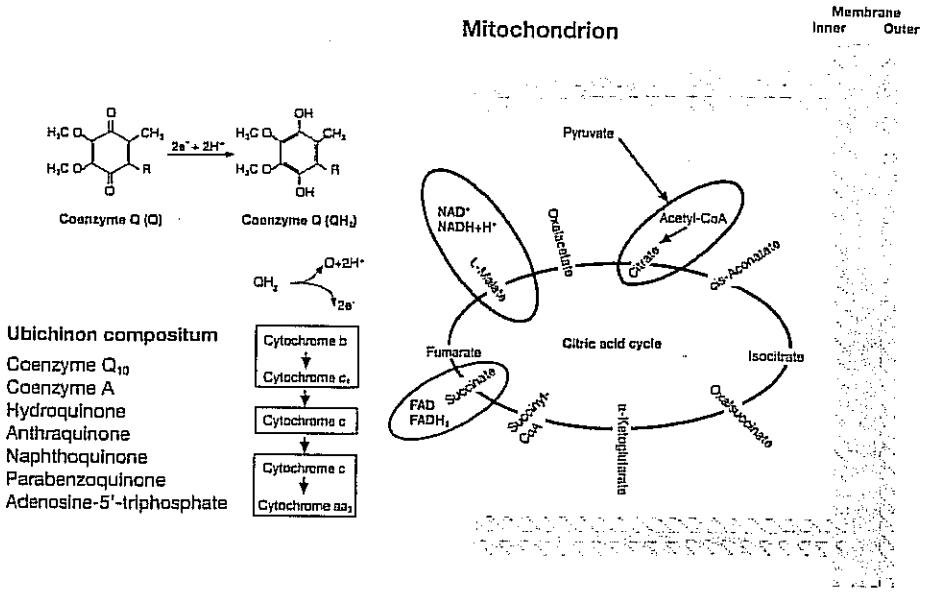

Figure 2: Specific components (catalysts) of Ubichinon compositum in the mitochondrial respiratory chain[7].

Histamine released by the mast cells of the bronchial mucosa plays an incisive role in the development of cellular phases. When histamine is not eliminated along biological pathways, it is driven out of the inflammation phase into the cellular phases, where it affects other organs and tissues (as in the bronchial mucosa, where it can trigger bronchial asthma).[1]

When the pH value of the matrix changes – that is, when the acid environment of cells involved in an inflammatory process is neutralized or alkalized through suitable measures – histamine is linked to carbonyl groups and forms Schiff bases, which are unstable in an acid environment. When the pH drops again, these compounds immediately break down into their components, and the resulting release of histamine may trigger asthma attacks.

In summary, the acids of the citric acid cycle (or their salts) stimulate blocked enzyme systems and other related metabolic processes. Therapeutic use of components of the citric acid cycle makes it possible to restore equilibrium in such damaged systems, eliminating metabolic blockages and driving toxic metabolites out of the tissues.

Use of Catalysts in Intermediary Metabolism

Antihomotoxic therapy is characterized by the use of intermediary catalyst therapy. These substances are produced during the physiological processes of cellular respiration and energy release (citric acid cycle, redox systems). Some of these substances are produced or activated through the conversion of other enzymes.

Because many conventional pharmaceuticals affect enzymes, damage to enzyme systems is frequently iatrogenic in origin. In addition, enzyme activity is impaired by increased environmental loading (e.g., by heavy metals or pesticides). Failure of an enzymatic function causes accumulation of not only metabolites that are present before the onset of the enzymatic reaction but also deficiencies of the substrates that are otherwise metabolized after the reaction occurs. For example, zinc is central to the activity of the collaginases (matrix metalloproteinases), essential in the metabolism of connective tissue. When zinc is displaced by nobler metals, the enzymes cease to function, resulting in excessive collagen formation (i.e., fibrosis).[10]

Homeopathic preparations of the relevant catalysts are administered to reactivate metabolic processes and restore blocked cellular or enzymatic functions. Since enzyme damage manifests primarily in chronic and degenerative diseases, this group of preparations should be considered for use in diseases such as alkaptonuria, cystinuria, and therapy-resistant jaundice due to chronic glucuronosyltransferase deficiency (Crigler-Najjar syndrome).

Groups of Catalysts

Group A: The Acids of the Citric Acid Cycle or their Salts

Therapeutic use of these substances is indicated for all diseases that are classified as cellular phases (impregnation, degeneration, and dedifferentiation phases) and are therefore characterized by misdirected enzymes or by blockages or disturbances in cellular respiration.

Group B: Quinones and Other Intermediary Respiratory Catalysts

Therapeutic use of preparations from Group B should be made primarily in cellular-phase diseases (that is, in impregnation, degeneration, and dedifferentiation phases).

Group C: Other Compounds with Stimulating Effects

This group includes other compounds, such as potentized vitamins, that have stimulating effects on catabolic and respiratory functions.

Indications for Therapy with Intermediary Catalysts

In general, intermediary catalyst preparations are indicated in all cellular phases – that is, in the impregnation, degeneration, and dedifferentiation phases to the right of Reckeweg's "Biological Section". To a large extent, these preparations can be administered independent of specific symptoms.

During treatment with catalysts, sensible lifestyle changes, such as adequate exercise and diet, should be implemented to stabilize the body's endogenous defenses. Supplementation to remedy deficiencies of vitamins and trace elements is important, as is treatment of dysbiosis.

Coenzyme compositum offers a simple and effective adjuvant therapy to stimulate blocked enzyme systems in degenerative diseases and cellular-phase enzyme malfunctions. Ubichinon compositum can be used to stimulate detoxification mechanisms by reactivating blocked enzyme systems in degenerative, cellular-phase disorders, such as neuralgia, migraine, and endocrine dysfunction or dysregulation. It is also useful in treating adverse effects of radiation therapy and in follow-up treatment of myocardial infarction (Figure 2). According to Küstermann, Ubichinon compositum has also proved effective in treating arthritis, gout, and rheumatic joint disorders.[11]

In summary, catalyst therapy can significantly improve interactions between cells and the intracellular matrix.

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