

Enzymic Oxidation of Aminoketones in Mammalian Blood Plasma

Whereas much is known of the biological significance of the intracellular amine oxidases that of the soluble amine oxidases of mammalian blood plasma is still unknown¹.

The first of the plasma enzymes to be discovered was the bovine spermine oxidase². In 1960, ELLIOTT³ reported that bovine plasma also oxidized aminoacetone, with the formation of methylglyoxal and ammonia. His suggestion, that the spermine oxidase was the catalyst of this reaction, finds support in our recent observations. A preparation of the bovine oxidase, purified as far as step 5 according to the procedure recently described by YAMADA and YASUNOBU⁴, was fully active on aminoacetone. We have found that this preparation acted also on δ -amino-laevulinic acid, but at a rate much less than with aminoacetone. It seems likely, therefore, that both aminoketones are substrates of spermine oxidase.

We have examined sera from a number of mammalian species known to contain an amine oxidase in order to find out if aminoacetone is oxidized. The serum of two other ruminants, the sheep and the goat, also acted on aminoacetone. However, the serum of *Procavia capensis*, a member of the order Hyracoidea, readily acted on spermine but was without action on aminoacetone. Thus, the ability to act on aminoacetone is not a property common to all animals that contain a spermine oxidase.

An enzyme that has been described as benzylamine oxidase occurs in the blood plasma of the horse, the pig and many other non-ruminants. In horse serum aminoacetone was found to be oxidized. In the pig, where a partial purification of the plasma oxidase has been achieved, neither aminoacetone nor δ -amino-laevulinic acid were oxidized at significant rates.

These observations are of interest in connection with the biological significance of the plasma enzymes. Oxi-

dases able to act on aminoacetone can be shown to be present in the plasma of a number of species, but not all animals in which a plasma oxidase has been found have this activity. The line of division between species with spermine oxidase and those with benzylamine oxidase does not coincide with the line of separation between animals able to act on aminoketones and those unable to do so⁵⁻⁷.

Zusammenfassung. Rinderserum oxydiert Aminoacetone rasch und δ -Aminolävulinsäure langsam, Reaktionen, die wahrscheinlich von der Sperminoxydase katalysiert werden. Aminoketone werden jedoch nicht im Plasma aller Tierarten oxydiert, welche Spermin oxydieren. Plasma von Tierarten, in denen Benzylaminoxidase vorkommt, oxydieren in der Regel ebenfalls Aminoacetone. Eine Ausnahme: Die Benzylaminoxidase des Schweines greift die beiden Aminoketone nicht merklich an.

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Beeinflussung der experimentellen allergischen Encephalomyelitis durch ϵ -Aminocapronsäure

Immunologische Reaktionen vom Tuberkulintypus (delayed reaction) können durch vorgängige oder gleichzeitige Gabe verschiedener Substanzen im Tierversuch abgeschwächt werden. Bei der experimentellen allergischen Encephalomyelitis (EAE), welche hauptsächlich seit den Arbeiten von WAKSMAN^{1,2} ebenfalls als verzögerte Immunreaktion aufgefasst wird, liessen ACTH und Corticosteroide, wie auch cytotoxische Substanzen eine hemmende Wirkung erkennen³⁻⁸.

Von der ϵ -Aminocapronsäure (ϵ -ACS) ist bekannt, dass sie verzögerte Immunreaktionen wirksam hemmen kann. Dies wurde bisher am Beispiel der Tuberkulinreaktion selbst⁹ und der Intoleranz gegen Homotransplantate¹⁰ gezeigt. Die genaue Wirkungsweise der Substanz ist gegenwärtig noch nicht bekannt¹¹⁻²⁰.

In Fortführung früherer Untersuchungen schien uns von Interesse, das Verhalten der EAE unter dem Einfluss von ϵ -ACS zu verfolgen.

Methodisches. Bei drei Serien von je 10 stammgleichen Kaninchen wurde homologes Rückenmarksgewebe gemischt mit Freund'schem Adjuvans (Difco) im Verhältnis 1:2 einzeitig in alle 4 Pfoten und an einer Stelle der Rückenhaut intrakutan injiziert. Die injizierte Menge betrug total 0,5 ml für jedes Tier, entsprechend ca. 150