

## INFLUENCE OF LEAD CATIONS AND ACETATE ANIONS ON ACTIVITY OF $\delta$ -AMINOLEAVULINIC ACID DEHYDRATASE IN BLOOD OF HUMAN AND EXPERIMENTAL ANIMALS *IN VIVO* AND *IN VITRO*

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**Summary.** The present study was design to investigate the influence of ions of lead and acetate on the activity of  $\delta$ -aminoleavulinic acid dehydratase ( $\delta$ -ALAD) in human, mice, canine and bovine blood *in vivo* and *in vitro*. The real threshold amounts of lead in haemolysed alkaline blood was determined by original direct electro thermal atomic absorption spectrophotometer method. Analysis revealed the same pattern of  $\delta$ -ALAD activity upon lead influence *in vivo* and *in vitro*: the extremes of enzyme's minimum activity at 0.1  $\mu\text{mol/l}$  – 0.5  $\mu\text{mol/l}$  lead and acetate ions concentration while maximum activity at 0.5  $\mu\text{mol/l}$  – 2.5  $\mu\text{mol/l}$  of lead and acetate ions were established. The inhibition of  $\delta$ -ALAD upon impact of lead ions at concentration  $>29.0 \mu\text{mol/l}$  was established while the same effects of acetate ions merely at concentration of supra 8040.5  $\mu\text{mol/l}$  was observed. The enzyme's activity has been decreased upon impact of ions constituted the portion of initial enzyme activity, respectively 7.5% for lead ions and 10.2% for acetate anions. This probably reveals the acetate-anions based background of the first minimum-extreme. Therefore, the parallel maximum-extreme (respectively 14.8% for lead ions and 6.93% for acetate ions) values indicates the lead-cations based origin of extreme. The study confirmed that the influence of heavy metals on the activity of  $\delta$ -ALAD always must be considered with the influence of ligandes anions. The calculated original approximate value of activity of  $\delta$ -ALAD in blood was established to be 476.0 nmol/l:s for mice and 691.4 nmol/l:s for humans, while extrapolating a curve to the concentrations of lead had been approaching to zero *in vitro*.

**Keywords:** lead, acetate, blood,  $\delta$ -aminoleavulinic acid dehydratase, activity, atomic absorption spectrophotometry.