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Chromatographic analytical opportunities on a thin film of mobilizable methil-groups of different biological objects under the influence of exogenic treatment

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In case of hyperlipidemic disease caused by alcohol, due to the S-Adenosyl-Methionin (SAM) deficiency, several vital metabolic roads, like protein synthesis, the synthesis of chatecholamins, and the nucleic acids, the methilation of phosphatidil-ethanolamin and phosphatidil-choline, and the activity of the synthesis of glutation, by which lipid peroxidation is hampered, decrease.

It has been proven that SAM is the methyl-donor in the trance-methyl reactions, and that the enzymatic methylation / demethylation processes equally generate HCHO.

Beside the free radicals and H_2O_2, the HCHO plays an important role in living organisms. To better understand the trance-methyl processes, research is being conducted into a compound group of various vegetal origins influencing the natural defensive system of the plants, some members of which have been proven to possibly play a role in human prevention as well.

Published results of different approaches have proved that among several vegetal bioactive molecules the betain (beetroot is an important source of it), and the resveratrol (red wine is one of its important sources) have characteristics blocking free radicals, and an antibiotic effect in charcinogenesis, reducing oxidative stress. The goal of our measurements, based on short term experiments with rats, was the detection of the changes resulting from the exogenic enlargement of mobilizable methyl-groups.

Our measurements were aimed at inherences that could enhance our understanding of the changes due to the quantitative enlargement of the methyl-pool.

During the experiments, male Wistar rats (5 animals per group) were treated for ten days. The control-group was fed with rat-nutriment only. The normal- nutriment -fed groups, treated with red wine and alcohol, received a daily amount of 8 ml per kg of body weight of a10,5 % alcoholic solution. The fat-rich nutriment -fed groups received cholesterol (2%), sunflower-seeds oil (20%) and cholic-acid (0,5%) mixed into the nutriment. The groups consuming beetroot too, received 2 gramm/kg of body weight lyophilized beetroot-powder mixed into the usual nutriment or into the fat-rich nutriment.

At the end of the treatment, we measured, besides the routine- laboratory parameters and the redox- parameters, the methylation- rate in the samples of blood and homogenized liver. We defined the bound endogenous HCHO with dimedone as adduct- forming compound as formaldehide.

We used pre-experiments to adapt the method earlier used for the examination of phytogenous tissues to the planned experiments. After that, we optimized the appropriate model- preparation and the enactable quantitative proportions to the reproducible detection. Finally, we carried out the measurements using the method of thin-layer chromatography, which enables, with the application of the appropriate standard, the simultaneous qualitative and quantitative analysis or comparison of 10 or 12 sample isochrones on a thin film-slab. Further advantages of the method are relatively simple model-preparation and quick and efficient separation.