

METAL DISTRIBUTION IN METALLOTHIONEINS OF CYTOSOLS FROM HUMAN CIRRHOTIC LIVERS

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Fractions containing metallothionein, which were extracted from liver cytosols of humans, were analysed to determine the complete distribution pattern of the metals copper, cadmium and zinc. Samples of cirrhotic livers which had come from organs removed during transplantation were examined for differences in the trace element binding pattern.

After the separation of cytosols from the samples, the first step was a membrane ultrafiltration of the solution. This was done in order to separate all high molecular proteins which had molecular weights $>100\text{kDa}$. Using this procedure, the metal content remained in its initial form, contrary to the often used heat treatment of samples, which would have significantly changed the copper distribution. The metallothionein itself was isolated using size exclusion and anion exchange chromatography. Its metal content was determined simultaneously on-line by combination with a ICP-AES as element detector. To enhance the sensitivity of the element detection, an ultrasonic nebulizer was used to produce the aerosols. The calibration of the procedure was done by means a column bypass-injection of elemental standards in the separation system. The reliability of the element determination was confirmed by a quality check of the procedure using commercially available reference proteins. The metallothionein content in the samples was calculated using the determined metal concentrations and the accepted metal/protein ratios for Cu, Cd and Zn. These values were compared with values which were taken from the ^{109}Cd -saturation-assay. Comparing various liver samples of different pathogenesis the highest level of Cu-MT was found in primary biliary cirrhosis.