Camel Glutathione S-transferases:
Tissue Distribution, Purification of the Renal
Enzyme, and Biochemical and Immunological
Comparison with Other Transferases

by

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TISSUE DISTRIBUTION, PURIFICATION OF THE RENAL ENZYME, AND
BIOCHEMICAL AND IMMUNOLOGICAL COMPARISON WITH OTHER TRANSFERASES.

ABSTRACT

The tissue distribution of glutathione, glutathione reductase and

glutathione S-transferase has been studied. Liver had the highest level

of glutathione (218.7 µmol/g wet weight), whereas brain had the lowest

level (66.4 µmol/g wet weight). The highest activity for glutathione

reductase was found in the kidney (2.6 µmol/min/mg protein) while the

lowest activity was found in the lung (0.9 µmol/min/mg protein). Gluta-

thione S-transferase activity was the highest in liver (4.2 µmol/min/mg

protein) and the lowest in brain (1.0 µmol/min/mg protein).

Glutathione S-transferase from camel kidney was purified to homo-
geneity by glutathione agarose affinity chromatography. The purified

renal glutathione S-transferase has a specific activity of 44 µmol/min/

mg protein and more than 85% of the applied activity was recovered by the

present purification procedure. The glutathione agarose affinity

chromatography resulted in a 49 fold purification and chromatofocusing

step resolved the purified enzyme into two major isoenzymes (PI 8.7 and

7.9) and two minor isoenzymes (PI 8.3 and 6.9). Disc gel electrophor-
esis of the purified enzyme in absence of SDS showed the presence of a
single protein band while in the presence of SDS and B-mercaptoethanol two protein bands were observed. The native molecular weight of the enzyme was estimated to be 55,000 and molecular weights of the subunits were 29,000 and 26,000. It appears that isoenzymes (pI 8.7 and 7.9) are homodimer of the 29,000 subunits, while isoenzymes (pI 8.3 and 6.9) are homodimer of 26,000 subunits.

The purified camel renal glutathione S-transferase was similar to other glutathione S-transferases purified from liver, lung and brain. The similarities involved the molecular weight, subunit composition and antigenic properties. However, the camel kidney enzyme differs in its sensitivity to heat. Glutathione S-transferases purified from other mammalian kidneys did not cross react with anti-camel kidney glutathione S-transferase. The ability of glutathione S-transferases purified from camel kidney, liver, lung and brain to bind bilirubin was studied, and it has been shown that the hepatic enzyme was the most to bind bilirubin whereas the brain enzyme was the least to bind bilirubin.