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Author(s)	YOSHINO, Saori
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CHANGES OF ACTIVE OXYGEN SCAVENGING ACTIVITIES AND DRUG METABOLISM DURING LIVER REGENERATION IN RATS

Saori YOSHINO

*Department of Toxicology,
Faculty of Veterinary Medicine,
Hokkaido University, Sapporo 060, Japan*

Alterations of activities of antioxidative enzymes and drug metabolism in regenerating liver were studied. Tests for a number of biochemical markers for liver function in plasma after 2/3 hepatectomy were also carried out.

Data from biochemical examination of plasma and the rate of liver regeneration showed that the injured liver was repaired rapidly and that liver regeneration was completed about 10 days after the partial hepatectomy. The activities of superoxide dismutase, catalase and glutathione peroxidase of hepatocyte fractions decreased in most cases and recovered as liver regenerated. However, the pattern of change of each parameter was different. The catalase activity in mitochondrial fraction increased after partial hepatectomy, while other activities were decreased. Thus, this increase of the mitochondrial catalase activity may be compensational.

The amount and the activity of cytochrome P-450 decreased markedly after partial hepatectomy, and gradually increased as liver regenerated. The amount of P-450 increased to above the control level at 15 days after the operation. There appears to exist a difference between P-450 isozymes in the pattern of changes judging from the difference in the extent of decrease in enzyme activities toward different substrates.

These results indicate that regenerating liver tissue is prone to damage due to active oxygen and harmful effects of drugs. This is particularly important for hepatic transplantation donors and I consider that this study provides information of value for clinical medicine.