

and decrease phases of the absorbance were fitted, respectively, to the following equations:

$$Y = A - B \exp(-k_1 t), \text{ and } Y = C \exp(-k_2 t) + D \exp(-k_3 t).$$

The rate constants k_1 and k_2 reflect uptake of ICG via blood flow and transport through the plasma membrane, and biliary excretion of ICG through bile canaliculi, respectively.

Results and Discussion. The three rate constants k_1 , k_2 , and k_3 in the reperfused lobe were calculated as 1.107 ± 0.145 , 0.068 ± 0.019 , and $0.032 \pm 0.007/\text{min}^{-1}$ (mean \pm SEM, $n = 4$), while in the control lobe these were 1.093 ± 0.187 , 0.135 ± 0.005 , and 0.035 ± 0.003 , respectively. The rate constant k_2 in the reperfused lobe decreased significantly ($p < 0.05$) as compared with the control. The constants A, B, C, and D in the reperfused lobe were 2.21 ± 0.23 , 2.09 ± 0.11 , 0.24 ± 0.10 , and 2.38 ± 0.27 , while in the control these were 1.28 ± 0.24 , 1.24 ± 0.23 , 0.41 ± 0.11 , and 1.28 ± 0.27 . Constants A, B, and D increased significantly ($p < 0.05$) in the reperfused lobe. In contrast, oxygen saturation of hemoglobin in the reperfused lobe increased significantly ($p < 0.05$) from the control value of $55.0 \pm 6.5\%$ to $75.9 \pm 7.2\%$. Hemoglobin concentration did not differ between the two lobes.

These results indicate that 60 min after reperfusion, bile excretion of the reperfused lobe was impaired in spite of increased oxygen supply. In conclusion, measurement of hepatic clearance of ICG by near-infrared spectroscopy can be used as a divided liver function test.

15 Acellular Reperfusion of Isolated Small Bowel Grafts

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Following small bowel reperfusion, oxygen free radicals (OFRs) are produced and leucocytes are activated, inducing endothelial damage in all microvascular beds. We have designed an experimental model in which reperfusion may be carried out without WBC and outflow discharge.

Material and Methods. The whole small bowel of male WAG rats was excised, and the mesenteric vessels, the duodenum, and the ileum were cannulated. After 6 h of cold ischemic preservation in Eurocollins, the graft was reperfused at 14 ml/min with different solutions enriched in oxygen ($pO_2 = 300$ mmHg) at 37°C . Two groups of 10 animals were used: (1) Ringer solution

(RS), and (2) modified Ringer solution containing verapamil, dexamethasone, norepinephrine, sodium pentobarbital, glucose, insulin, and bicarbonate (MRS). Arterial pressure, oxygen extraction, CO_2 production, Na^+ , K^+ , and Ca^{2+} were assayed every 5 min for 45 min.

Results. Reperfusion with RS alone resulted in a collapse of the portal outflow after 10 min. In contrast, when MRS was perfused, the mean arterial pressure (105 ± 10 mmHg), the venous outflow (10 ± 2 ml/min), and the metabolic activity of the graft were maintained. It was also observed that there was O_2 extraction ($63 \pm 3\%$) and CO_2 production ($80 \pm 10\%$) at levels close to those found in controls. The values for Na^+ (125 ± 2 mmol/l), K^+ (3.8 ± 0.3 mmol/l), and Ca^{2+} (1.01 ± 0.1 mmol/l) were within the ranges of normal values.

Conclusions. Our modified Ringer solution allows a successful 45 min reperfusion of isolated small bowels, with clear reactivation of the metabolic activity (glucose consumption, and CO_2 production) of intestinal tissues, while casting aside the venous drainage of OFR. Hence, this is a fair model for checking the involvement of different blood components in the ischemia/reperfusion syndrome.

16 Correlation between Idiopathic Hepatolithiasis and Mucin Gene Polymorphism

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The pathogenesis of hepatolithiasis is not clear. Stones of hepatolithiasis are known to be made of bilirubin, calcium, and mucin, which form the essential mesh structures. We analyzed the relation between mucin gene polymorphisms and hepatolithiasis using Southern blotting.

Materials and Methods. We collected peripheral blood samples from 45 patients with hepatolithiasis and 48 normal individuals in Japan. Lymphocytes were separated by density gradient centrifugation, then DNA was extracted by the phenol-chloroform method. After digestion with restriction enzyme Hinf I, DNA samples were separated by agarose gel electrophoresis and transferred to a nylon filter. Hybridization was performed with cDNA probe pMUC-7, which codes tandem repeat regions of the mucin core protein.

Results. Four different alleles, 6.6 kb, 4.5 kb, 4.2 kb, and 3.0 kb, were detected in both hepatolithiasis and normal control groups. The 4.5 kb allele was more