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The role of stem cell factor in the regeneration after toxic Liver injury

Danilova I^{1,2}, Medvedeva S^{1,2}, Bulavintseva T^{1,2} and Mukhlynina E^{1,2}

¹Institute of Immunology and Physiology, Russia

²Ural Federal University, Russia

The understanding of reparative liver regeneration remains critical for physiology and medicine. The liver recovery under the carbon tetrachloride (CCl₄) poisoning, which is a classic hepatotropic toxic substance, can derive from various sources including the hematopoietic stem cells (HSC). It is well-known that endothelial liver cells and Kupffer cells can synthesize stem cell factor (SCF) which is a key cytokine in the mobilization of HSCs from marrow bone into the damaged organ. We studied the role of SCF in the reparative regeneration during diffuse toxic liver injury initiated in male Wistar rats by CCl₄ (i.p. 50 mg/kg). The study conforms to the Guide for the Care and Use of Laboratory Animals (NIH Publication No. 85-23, revised 1985). The number of proliferating liver cells was estimated by immunohistochemistry (Purified Mouse Anti-Human Ki-67, BD Biosciences, USA). The SCF content in the blood plasma was determined by ELISA (SCF Mouse ELISA kit, Abcam, UK). The SCF concentration in blood, the impairment and mitotic indexes of hepatocytes, the number of binucleate hepatocytes and Ki67+ liver cells (hepatocytes, Kupffer cells) were significantly elevated during the liver reparative regeneration estimated on day 3 and 7 after the poisoning. Therefore, the diffuse damage of the liver was paralleled to the augmented SCF in blood, which is likely due to stimulated synthesis by hepatocytes and Kupffer cells. The results may facilitate to open up the role of hematopoietic stem cells in the reparative regeneration of liver.

Biography

Danilova I is a DSc (Biology and Pathophysiology), Professor of Ural Federal University, director of Laboratory of Morphology and Biochemistry (LMB), Institute of Immunology and Physiology of the Ural Branch of Russian Academy of Science (IIP). She is an author of more than 220 scientific papers. Medvedeva S is a PhD (Medicine), the pathologist of LMB IIP. She has published 97 papers in reputed journals. Bulavintseva T is a young investigator; her position is a junior researcher in LMB IIP. Mukhlynina E is a PhD (Biology), the scientific associate of LMB IIP. She has published 10 papers in reputed journals.

ig-danilova@yandex.ru

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