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DISCUSSION

On the Paper by E. F. Sato and Coauthors "Oxidative Stress Promotes the Regression of Fetal Liver Hemopoiesis"

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In the paper entitled "Oxidative stress promotes the regression of fetal liver hemopoiesis" [1], Sato and his coauthors proposed an interesting hypothesis that the regression of fetal liver hemopoiesis occurs due to oxidative stress. They provide the following literature and experimental data, which seem to support their hypothesis.

1. Literature data: immediately after birth the oxygen pressure of arterial blood rises fourfold; activities of Cu/Zn- and Mn-superoxide dismutase, catalase, and glutathione peroxidase and also levels of GSH and α-tocopherol are lower in the fetal liver than those in adult liver; after birth activity of γ-glutamyl transferase (GGT) decreases in the liver and increases in the kidneys.

2. The authors' own results: analysis of GSH content and activity of glutathione metabolizing enzymes in hepatocytes and hemopoietic cells on the 18th, 20th, and 21st days of gestation and on the first day after birth; lower survival of hemopoietic cells than hepatocytes after 4 h *in vitro* incubation and positive effect of thiol addition.

From our viewpoint, these may be considered as indirect evidences supporting this hypothesis. Direct experimental evidence could be: i) marked accumulation of reactive oxygen species and demonstration of oxidative modification of molecules in hepatic hemopoietic cells; ii) inhibition of antioxidant systems (including the GSH system of the hemopoietic cells); iii) close correlation of these changes (and their time-course) with *in vivo* hemopoietic cell death in the liver.

Unfortunately, this paper lacks such materials and the comparison of some fetal and adult parameters has doubtful validity. In human fetus bone marrow becomes the main hemopoietic organ to six months of gestation and hepatic hemopoiesis ceased from the second week after birth [2]. Consequently, regress of hemopoiesis takes a rather long time. However, the authors have not indicated time intervals required for hemopoiesis transfer form the liver to the bone marrow; they just assume that this occurs immediately after birth or 1-2 days before birth. This is very questionable that regress of rat liver hemopoiesis occurs during such a short period. In the results of the experiments given in the paper, the fetuses at the late gestation period (day 21) and newborns did not differ in GSH concentration and GGT and glutathione reductase activities both in hepatocytes and hemopoietic cells. Only glutathione peroxidase activity was lower in hepatocytes but not in hemopoietic cells. It should be noted that the table lacks such important information as statistical significance (p value), number of experiments; it is also unclear whether SEM or SD is given.

Thus, from our viewpoint this original hypothesis requires serious experimental validation.

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REFERENCES

1. Sato, E. F., Nakagawa, E., Hiramoto, K., Yamamasu, S., Moriyama-Shimamoto, I., and Inoue, M. (2004) *Biochemistry* (Moscow), **69**, 18-22.
2. Dvorkin, P. (ed.) (1996) *Pediatrics* [Russian translation], GEOTAR, Moscow.

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