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Author	浦野, 四郎(Urano, Shiro) 橋詰, 緑(Hashizume, Midori) 棚木, 典子(Tochigi, Noriko) 松尾, 光芳(Matsuo, Mitsuyoshi) 白木, 正孝(Shiraki, Masataka) 井藤, 英喜(Ito, Hideki)
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Vitamin E and the Susceptibility of Erythrocytes and Reconstituted Liposomes to Oxidative Stress in Aged Diabetics*

Shirō URANO**, Midori HOSHI-HASHIZUME, Noriko TOCHIGI**, Mitsuyoshi MATSUO**,
Masataka SHIRAKI*** and Hideki ITO***

浦野四郎**, 橋詰 緑, 榎木典子**, 松尾光芳**, 白木正孝***, 井藤英喜***

A remarkable increase in the permeability of erythrocyte ghosts and liposomal membranes composed of erythrocyte lipids from aged diabetics was revealed by measuring [^{14}C] glucose leakage. There were no significant differences in the contents of free cholesterol or phospholipids, or in the cholesterol/phospholipid ratio between diabetic and normal erythrocyte membranes, but significantly higher amounts of unsaturated fatty acids, arachidonic acid and docosahexaenoic acid were observed in the erythrocyte membranes of diabetics. Reconstituted liposomes prepared from aged diabetic erythrocyte lipids were highly susceptible to superoxide-induced oxidative stress. Vitamin E was highly effective in suppressing the peroxidative lysis of liposomes composed of diabetic erythrocyte lipids. The effect of superoxide dismutase (SOD) on the inhibition of peroxidation of unsaturated lipids within liposomal membranes was less than that of vitamin E.

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** 東京都老人総合研究所

*** 東京都老人医療センター