and/or cytostatic action. These findings demonstrate that above sphingolipids in some circumstances might act as a stimulator of host defense mechanism against progress of tumors. Therefore, these drugs should be useful for treatment of micrometastases in local areas after operation.

S15.11

Lipid Peroxide Level of Cultured Endothelial Cells of Artery is Increased by Glycated Protein and an Iron Chelate

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In our previous study, we reported that plasma lipid peroxide levels of diabetic patients with angiopathy are higher than those of patients without angiopathy[1] and that lipid peroxides increased in the bloodstream initiate atherogenesis by injuring endothelial cells of arteries[2]. Since glycated protein is known to increase in diabetic patients, we decided to examine whether glycated protein provokes lipid peroxidation in endothelial cells of arteries, and studied the effect of glycated protein on the lipid peroxide level and cell injury of cultured endothelial cells of bovine artery. Since Sakurai *et al.*[3] reported that iron-glycated polylysine induced lipid peroxidation, we also checked the effect of glycated protein and an iron chelate.

For glycation of fetal calf serum (FCS), FCS was incubated with glucose at 37°C for 1 week under sterile conditions. A mixture of $FeCl_3$ and ADP was prepared immediately before the experiment. Cells were cultured at 37°C for 24 h in four different media: (1) normal medium, (2) normal medium + mixture of $FeCl_3$ and ADP, (3) medium containing glycated FCS, and (4) medium containing glycated FCS + mixture of $FeCl_3$ and ADP. After the culture, the lipid peroxide level of cells was slightly increased in (2) and (3) as compared with that in (1), but that in (4) was remarkably increased. In accordance with the increase in the lipid peroxide level, the amount of lactate dehydrogenase leaked from the cells increased. These results suggest that glycated protein-iron chelate stimulates lipid peroxidation of endothelial cells, and thereby initiates injury to endothelial cells of arteries.

1. Sato, Y., Hotta, N., Sakamoto, N., Matsuoka, S., Ohishi, N. and Yagi, *K., Biochem. Med.*, **21**, 104–107 (1979).
2. Yagi, K., Ohkawa, H., Ohishi, N., Yamashita, M. and Nakashima, T., *J. Appl. Biochem.*, **3**, 58–65 (1981).
3. Sakurai, T., Sugioka, K. and Nakano, M., *Biochim. Biophys. Acta*, **1043**, 27–33 (1990).

S15.12

Hyaluronidase Polymorphism in Somatic Cells and Fluids from Human, Rat, Mouse and other Mammals: Structure, Transport, Deficiency

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Hyaluronidases (E.C. 3.2.1.35) degrade not only hyaluronan, a major component of extracellular matrix, but also chondroitin 4-sulfate and chondroitin 6-sulfate. The hyaluronan/hyaluronan-synthetase/hyaluronidase system plays a major role in many biological processes involving the maintenance and integrity of the extracellular matrix, and its interactions with the cell surface. These processes include phagocytosis, cell adhesion, migration, mitosis, embryonic development and differentiation, normal and tumor cell proliferation. Hyaluronidases constitute a large family of enzymes that can be grouped into various types according to their mechanism of action and origin. In mammals, two categories of hyaluronidase can be distinguished: one which is exclusively found in spermatozoa and testicular tissue, the other type is found in somatic cells, mainly in their lysosomes. The latter, which is an acid hydrolase is present in human liver, ovary, placenta, mammary tissue and platelets but not in cultured skin fibroblasts. It is also present in serum, synovial and interstitial fluid in humans, dogs, rabbits, hamsters, rats, mice and mink. When hyaluronidase is analyzed by polyacrylamide-hyaluronan gel electrophoresis, confirmation of the presence and of the various forms of this enzyme is revealed as being species specific. The animal genotype also influences this polymorphism. The locus that determines hyaluronidase polymorphism in mice has been assigned to chromosome 9. The pattern of hyaluronidase in fluids such as serum, synovial fluid and urine, has some forms in common with those of somatic cells. Some of the multiple forms of hyaluronidase seem to depend on different amounts of sialic acid on the same protein. We encountered 4 patients with serum hyaluronidase deficiency among 47 sera from a group of selected patients displaying dysostosis multiplex, without mucopolysaccharidurie. These patients, all of them children, displayed various bone disturbances, (vertebral malformations, shortening and thickening of long bones, joint defformities); visceromegaly was absent, as well as gross mental retardation. The activities in serum of β-*N*-acetylglucosaminidase and β-glucuronidase (enzymes participating in the total degradation of hyaluronan) and the seric hyaluronan concentration were normal. Two cases of I-cell disease were studied, one had normal hyaluronidase activity, the other displayed a slight deficiency in serum. This last finding suggests that hyaluronidase activity in serum is not dependent on mannose-6-phosphate receptors.

S15.13

Specific Lectin-Carbohydrate Interactions in Human Lung Tissue — An Alternative Explanation for Meconium Aspiration Syndrome?

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Meconium stained amniotic fluid complicates between 5% and 15% of live births and is therefore a frequently encountered problem of both pediatricians and obstetricians. Meconium aspiration may lead to a series of respiratory complications from light asphyxia to a full blown respiratory distress syndrome demanding assisted ventilation and intensive care. There is no consensus about the pathogenesis of the meconium aspiration syndrome but general factors such