

effect of the inhibition of fertilization by the oviductin was minimized to about 50% by the presence of cumuli, suggesting that the cumulus oophorus has some antagonizing effect(s) to oviductin-sperm interaction which renders spermatozoa capable of regaining the zona-binding ability. Our further results provide another evidence to demonstrate the involvement of glycoprotein(s) in gamete interaction.

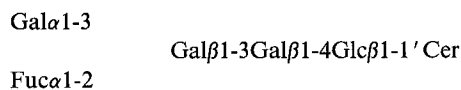
S8.23

Cell Adhesion and Blood Group Active Glycosphingolipids in *Xenopus laevis* Embryos

N. Nakajo², K. Nomura², K. I. P. J. Hidari¹, and Y. Hirabayashi¹

¹Laboratory for Glyco-Cell Biology, Frontier Research Program, The Institute of Physical and Chemical Research (RIKEN), Wako-shi, Saitama, Japan; and the ²Department of Biology, Faculty of Science, Kyushu University, Fukuoka, Japan.

In order to understand the biological function of glycoconjugates during development and morphogenesis, we have studied cell adhesion system of *Xenopus laevis* embryos through cell surface glycoconjugates. We have found that human antibody against human blood group type B blocks Ca⁺⁺ dependent adhesion of *Xenopus* blastula cells, suggesting that blood group related glycoconjugates play an important role on cell-cell adhesion in the blastula cells. In spite of their significance, their details of blood group active glycoconjugates including glycosphingolipids are little known. TLC-immunostaining analysis with anti-blood type B showed that *Xenopus laevis* eggs contained many immuno-reactive glycosphingolipids. Among B-active glycosphingolipids detected, a major glycosphingolipid has been isolated and characterized as a novel type of blood group B antigen as follows:



Immunohistochemical analysis showed that type B antigen was expressed in blastomere cell surface during egg to blastula stage, suggesting again the involvement of the blood group active glycoconjugates in cell-cell adhesion of *Xenopus* embryos.

S8.24

Gangliosides GM1b and GD1 α , as the Adhesion Molecules of Mouse Lymphosarcoma Cells to the Hepatic Sinusoidal Endothelial Cells

T. Taki¹, M. Ogura¹, M. Nakajima² and S. Handa¹

¹Department of Biochemistry, Tokyo Medical & Dental University; ²Institute of Applied Microbiology, University of Tokyo, Tokyo 113 Japan.

Glycolipid composition of mouse lymphosarcoma cell line (RAW117-P) was examined and compared with that of a malignant variant RAW117-H10 with high metastatic property to the liver. Both cell lines contained GlcCer, LacCer, Gg₃Cer and Gg₄Cer as the neutral glycolipids, and GM1b and GD1 α as the gangliosides. Marked difference was found in the quantity of glycolipids. The content of neutral glycolipids in the parental cell line was higher than that in the

variant cell line. On the other hand, the content of GD1 α in RAW117-H10 cells was much higher than that in the parental cells. On the basis of the glycolipid analysis, we examined if the glycolipids found in these cell lines are involved in the adhesion of the tumor cells to the hepatic sinusoidal endothelial (HSE) cells. GM1b and GD1 α were found to inhibit the adhesion of the tumor cells to HSE cells when HSE cells were preincubated with these gangliosides prior to the coculture with the tumor cells. But neutral glycolipids did not show the inhibitory activity. From the finding, GM1b and GD1 α were assumed to be the molecules involved in the adhesion of the metastatic cells to the target tissue.

S8.25

A New Family of C-P Glycosphingolipids in *Aplysia*: Structures and Functions

S. Abe¹, S. Araki¹, M. Satake¹, F. Arakane^{2,3}, K. Fukunaga², K. Miyazaki³, H. Okamura³, E. Miyamoto²
¹Department of Neurochemistry, Brain Research Institute, Niigata University, Niigata; ²Department of Pharmacology; ³Department of Obstetrics-Gynecology, Kumamoto University Medical School, Kumamoto, Japan.

In Protostomia, including *Aplysia*, gangliosides have been not detected yet. We found more than 30 species of glycolipids in the tissues of *Aplysia kurodai*. These glycolipids constitute a new family of phosphoglycosphingolipids (PnGSLs) and most of them have one to three moles of 2-aminoethylphosphonate (2-AEP). They are subgrouped based upon the sugar at non-reducing end.

Polyclonal antibodies raised in rabbits discriminate the subgroups. By the immunohistochemical findings, these subgrouped glycolipids were found to be specifically located in the tissues of *Aplysia*. For example antiserum that react with glycolipids having pyruvylated galactose at their non-reducing ends stained only nerve bundles of *Aplysia*.

Partially purified rat brain cyclic AMP dependent protein kinase (A-kinase) was stimulated by purified *Aplysia* glycolipids (SGL-I, SGL-I', SGL-II, F-21, FGL-V, HF-SGL-II). Of these glycolipids, SGL-II was the most potent. It is suggested that SGL-II binds to a site of the regulatory subunit of A-kinase which is different from cyclic AMP binding site, and stimulates A-kinase.

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Carbohydrate Specificity of *Laburnum anagyroides* Lectin

V. E. Piskarev, A. A. Borovskaya, I. A. Yamskov, V. I. Tkachenko*, M. D. Lutsik*
*Institute of Food Compounds, Academy of Sciences of Russia, Vavilov street, 28, 117813 Moscow, Russia; *A. V. Palladin Institute of Biochemistry (Lvov Branch), Academy of Sciences of Ukraine, Dragomanov street 14/16, 290005 Lvov, Ukraine.*

L. anagyroides bark lectin was isolated by affinity chromatography on immobilized human ovarian-cyst fluid mucin H. Lectin is a 130 kD tetrameric glycoprotein homogeneous by PAGE.

A large set of fucose-containing compounds including simple D- and L-fucose derivatives, synthetic oligosaccharides, mono-, di- and trifucosylated human milk oligosaccharides