S13.13

Expression of β1-6-Branched *N*-Linked Oligosaccharides is Associated with Activation in Human T4 and T8 Cell Populations

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Activation of human T lymphocytes by phorbol myristate acetate (PMA) and leukoagglutinin from *Phaseolus vulgaris* (L-PHA) results in important changes in *N*-glycosylation. The most important event is the increase, in both T4 and T8 cells, especially the latter, of L-PHA$^+$ structures characterized by β1-6 branching of complex-type oligosaccharides. Moreover, the existence of a CD4-mediated increase of these β1-6-branched structures on positively selected T4 cells, as compared with the negatively selected ones, suggests that the presence of these structures, not detectable on T8 resting cells, could be related to stimulation events triggered by both selection methods. This β1-6 branching on *N*-glycans, strongly asssociated with a metastatic phenotype in human and rodent tumors (1), is exhibited by numerous glycoproteins on stimulated cells, as shown by blot analysis. Therefore, it appears that, like malignant transformation in the rat 2 and SP1 tumor models lymphocyte activation is associated with increased β1-6 GlcNAc branching of *N*- (this study) as well as *O*-linked oligosaccharides (2). It is conceivable that lymphocyte acquisition of β1-6-branched Asn-linked oligosaccharides by adhesion glycoproteins could induce, in some cases, changes in cell-extracellular matrix interactions and, consequently, in the migration of such cells into lymphoid or inflammed tissues. These changes could participate in the modulation of the inflammatory process and the immune response.

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(2) Piller, F., Piller, V., Fox, R. I., Fukuda, M. (1988) *J. Biol. Chem.,* **263**: 15146–15150.

S13.14

Cocaine-Induced Changes in the Ganglioside Content of Rat Encephalic Areas and Liver

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Cocaine is a stimulant of the central nervous system, the abuse of which has increased considerably in recent years and has become a major medical and social problem. Gangliosides (sialic acid containing glycosphingolipids) are constituents of the plasma membrane and are ubiquitous in vertebrate cells. They are thought to participate in an important way as binding sites for several biologically active molecules, and also to be involved in cell growth, differentiation and in the process of synaptic transmission.

The effect of repeated administration of cocaine on ganglioside content and pattern were studied in adult Wistar rats. Intraperitoneal injections of cocaine hydrochloride (0.5 and 10 mg free base/kg body weight) were administered over a period of five hours, one injection per hour. Both cocaine doses caused a significant decrease in rat forebrain ganglioside concentration, the highest dose inducing a largest decrease. Animals injected with the highest dose showed an increase in their cerebellum ganglioside content as compared to controls. There were no statistically significant changes in the ganglioside concentration of both the brain stem and the liver. Minor changes were observed on the distribution of individual gangliosides (ganglioside pattern) of the three encephalic areas studied. However, the ganglioside pattern of the liver showed several changes that were more pronounced when the highest dose was used. An increase of more complex gangliosides from the two biosynthetic pathways "a" and "b" (G_{M1}, G_{D1a}, G_{D1b}, G_{T1b} and G_{Q1b}) in parallel with a decrease of less complex gangliosides (G_{M3}, G_{M2}, G_{D3}, and G_{D2}) was found.

S13.15

The Mixed Phenotype of Human Bronchial Epithelial Cells in Secondary Culture

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Cells from human bronchial surface epithelium were grown for three weeks in secondary culture on type I collagen gel in the presence of radioactive precursors ([^{3}H]-glucosamine or [^{35}S]-sulfate).

Polydisperse radiolabelled mucin-like glycoproteins were identified using gel-chromatography before and after β-elimination and gel electrophoresis followed by autoradiography. They were also characterized by western blotting with anti-mucin antibodies.

Proteoglycans (PG) were also secreted and the presence of perlecan was observed. These PG comprised chondroitin sulfate and heparan sulfate, which were identified by agarose gel electrophoresis after proteolysis of proteoglycans, using glycosaminoglycan-degrading enzymes. Hyaluronic acid was also secreted.

The epithelial cells also secreted lysozyme and mucus protease inhibitor, proteins which, *in vivo*, are not synthesized by the bronchial surface epithelium but by submucosal serous glands.

These results demonstrate that cells from the surface bronchial epithelium in secondary culture synthesize molecules from mucous and from serous origin. They suggest that these cells in secondary culture may dedifferentiate to common progenitors of both surface and submucosal glandular cells.

S13.16

Retinoic Acid Induces the Expression of β-1,4-Galactosyltransferase by Prolonging the Half-Life of its mRNA, not by Transcriptional Activation, in F9 Teratocarcinoma Cells

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Retinoic acid(RA) induces the differentiation of mouse