

# 2<sup>nd</sup> Glycobiology World Congress

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## Role of sialylation in 3D multicellular tumor spheroid formation and *in vivo* tumors

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Multicellular tumor spheroids are now at the forefront of cancer research, designed to mimic tumor-like developmental patterns *in vitro*. Tumor growth *in vivo* is known to be highly influenced by aberrant cell surface specific sialoglycan structures on glycoproteins. Aberrant sialoglycan patterns that facilitate spheroid formation are not well defined. Here, matrix-free spheroids from human breast MCF-7 and pancreatic PANC1 cancer cell lines and their respective tamoxifen (TMX) and gemcitabine (Gem) resistant variants were generated using the RGD induced self-assembly platform. Pretreatment with specific lectins, exogenous neuraminidase dose dependently reduced spheroid volume formation. Oseltamivir phosphate (OP) promoted cell aggregation and compaction into spheroid formation. PANC1 and triple negative breast MDA-MB231 xenograft tumors from untreated and OP-treated RAGxCy double mutant mice expressed significant higher levels of  $\alpha$ -2,3-sialoglycan (SA) than  $\alpha$ -2,6-SA. MCF-7 spheroids expressed higher  $\alpha$ -2,3-SA to  $\alpha$ -2,6-SA ratio. The relative levels of specific sialoglycan structures on the cell surface facilitate avascular 3D multicellular tumor spheroids *in vitro* as well as *in vivo* tumors.

### Biography

For the past 35 years, Dr. Szewczuk is Full Professor of Immunology and Medicine, Queen's University, Kingston, Ontario Canada. He received his B.Sc. in Chemistry (U. of Guelph), M.Sc. in Biochemistry (Guelph), Ph.D. in Immunochemistry (U. of Windsor) and post-doctoral training with Gregory W. Siskind, M.D. in cellular immunology at Cornell University Medical College, NYC. Dr. Szewczuk's recent research has focused on the role of glycosylation in receptor activation with a particular focus of TOLL-like, nerve growth factor Trk, EGFR and insulin receptors. He has discovered a novel receptor-signaling platform and its targeted translation in multistage of tumorigenesis.

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