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Therapeutic targeting neuraminidase-1 in multi-stage of tumorigenesis

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Various reports have suggested that receptor glycosylation modification may in fact be the invisible link connecting ligand-binding and receptor dimerization. A novel organizational signaling platform linked to the glycosylated receptor tyrosine kinases (RTK) (e.g., EGFR, TrkA, insulin) and TOLL-like receptors induced receptor activation process, all of which are known to play major roles in tumorigenesis. This signaling paradigm proposes that ligand binding to its receptor on the cell surface induces a conformational change of the receptor to initiate MMP-9 activation to induce Neu1. Activated Neu1 hydrolyzes α-2, 3-sialyl residues linked to β-galactosides which are distant from the ligand binding sites. These findings predict a prerequisite desialylation process by activated Neu1 enabling the removal of steric hindrance to receptor association. The importance of these findings signifies an innovative and promising entirely new targeted therapy for cancer. The role of mammalian neuraminidase-1 (Neu1) in complex with matrix metalloproteinase-9 and G-protein coupled receptor tethered to RTKs and TLRs is identified as a major target in the multi-stage of tumorigenesis. Preclinical studies support an entirely new cancer therapy targeting different growth factor receptors, tumor neovascularization, chemo-resistance of tumors, immune-mediated tumorigenesis and the development of tissue invasion and metastasis. Evidence exposing the link connecting growth factor-binding and immune-mediated tumorigenesis to this novel receptor-signaling paradigm will be presented in its current relationship to pancreatic, ovarian and triple-negative breast cancers.

Biography

Myron R Szewczuk has completed his PhD in 1974 from University of Windsor in Biology and Immunochemistry and Postdoctoral studies from Cornell University Medical College, New York City, USA in Cellular Immunology with Dr Greg Siskind (1975-1978). He is presently a Full Professor of Immunology and Associate Professor of Medicine, Queen's University, Canada. He has published more than 100 papers in reputed journals and has been serving as an editorial Board Member of repute.

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