OMICS International
conferenceseries.com

Pi-Wan Cheng, J Glycobiol 2015, 3:3
http://dx.doi.org/10.4172/2168-958X.S1.002

Glycobiology World Congress

August 10-12, 2015 Philadelphia, USA

Disregulation of golgi localization of glycosyltransferases alters mucin O-glycosylation and survival or metastatic properties of cancer cells

Pi-Wan Cheng
University of Nebraska Medical Center, USA

Glycosylation is a posttranslational, template-independent process. Mucin O-glycosylation is catalyzed by glycosyltransferases (GTs) localized at various Golgi stacks according to the glycosylation steps they participate in. We have identified three different Golgi targeting sites for GTs. Giantin is the exclusive site for core 2 N-acetyl glucosaminyl transferases (C2GnTs) and the primary site for Galβ3GalNAc:α2-3sialyltransferase 1 (ST3Gal1), GM130-GRASP65 is the primary site for core 1 synthase (C1GalT1) and the secondary site for ST3Gal1 and GM130-giantin is the secondary site for C1GalT1. Defective giantin in aggressive prostate cancer cells prevents C2GnTs but not other GTs from targeting the Golgi. As a result, core 2-associated glycans such as polylactosamine cannot be formed but sialyl-T level is elevated. Inhibition or knockdown of non-muscle myosin IIA restores giantin structure, normal Golgi targeting of GTs and core 2-associated polylactosamine which renders these cancer cells susceptible to galectin 1-induced apoptosis. The result demonstrates that aggressive prostate cancer cells acquire survival advantage by altering Golgi targeting of GTs. This process does not require any change in the expression of GT genes. Also, we have identified proteins that help retain C2GnTs in the Golgi; Golgi phosphoprotein 3 (GOLPH3) for C2GnT-L and keratin 1 for C2GnT-M. Loss of keratin 1 prevents Golgi localization of C2GnT-M and increases sialyl-T level. Loss of GOLPH3 prevents Golgi retention of C2GnT-L causes loss of selectin ligand sialyl Lewis x and decreases selectin-mediated metastatic properties. In conclusion, disregulation of Golgi targeting or retention of GTs can alter mucin O-glycosylation and survival or metastatic properties of cancer cells.

Biography

Pi-Wan Cheng received his PhD degree in Biochemistry from Case Western Reserve University in 1975 and is currently a Professor of Biochemistry and Molecular Biology at University of Nebraska Medical Center. He has published more than 95 papers mostly in Glycobiology field and has served in grant review panels of many funding agencies including NIH, states and nonprofit organizations. He is a Member of the Editorial Boards of the *Journal of Glycobiology* and the *American Journal of Respiratory Cell and Molecular Biology.*

pcheng@unmc.edu

Notes: