The World of Glycobiology : *O*-GlcNAc modification and N-Glycosylation

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β-*O*-linked *N*-acetylglucosamine (*O*-GlcNAc) is a nucleocytosolic post-translational modification on serine and threonine residues that is dynamically regulated by *O*-GlcNAc transferase and *O*-GlcNAcase. Many proteins are *O*-GlcNAcylated in response to various cellular processes, including transcription, proliferation, apoptosis and signal transduction. So, we have studied the function of *O*-GlcNAc modification on several proteins. We found that *O*-GlcNAcylated NF-κB was translocated into nucleus and had increased transcriptional activity. In glucose starvation conditions *O*-GlcNAcylated proteins might be protected from degradation by Hsp-70, which is the chaperon containing lectinic activity. Also *O*-GlcNAc modification seems to be involved in neurite outgrowth in cultured neuronal cells. We also observed that *O*-GlcNAc modification plays a role in final differentiation of myoblast cells to myotubules and cardiomyocyte differentiation in ES cells. *O*-GlcNAcylation is highly conserved, so we were able to find several novel proteins modified with *O*-GlcNAc in *Drosophila* using SL2 fly cell line. In addition, we are finding a role of *O*-GlcNAcylation related in innate immunity with *Drosophila*. Besides, we have studied the function of *N*-glycosylation in development. The functional block of dolichol phosphate mannose synthase I (DPM1) homolog, one of the enzymes involved in *N*-glycan assembly, by RNA*i* in *C.elegans* caused various developmental defects. It indicates that *N*-linked glycosylation have important roles involved in development.