

Functional Roles of O-GlcNAc Modification on Nucleocytoplasmic Proteins

Jin Won Cho

*Department of Biology, School of Biological Sciences, Yonsei University, Seoul,
120-749, Korea*

E-mail: chojw311@yonsei.ac.kr, Tel:82-2-2123-4083, Fax: 82-2-363-4083

O-GlcNAc modification on nucleocytoplasmic proteins is found in all eukaryotes. Like phosphorylation, this modification is ubiquitous and very dynamic. The O-GlcNAc is modified at serine and threonine residues of the targeted proteins and its dynamic modification is caused by the action of O-GlcNAc transferase (OGT) and O-GlcNAcase. Because O-GlcNAc modification sites are shared with phosphorylation, this modification appears to have a 'yin-yang' relationship with phosphorylation with many regulatory proteins and to play an important role in regulation of protein function. Recently we found function and attachment sites of O-GlcNAc modification in p53 and NF- κ B. Research of O-GlcNAc modification is rapidly growing field and especially O-GlcNAc modification is very important in diabetes, neural disease and development, and many cancers.

Recent Publications

1. Won Ho Yang, Ji Eun Kim, Hyung Wook Nam, Jung Won Ju, Hoe Suk Kim, Yu Sam Kim, and Jin Won Cho (2006) Modification of p53 with O-linked N-acetylglucosamine regulates p53 activity and stability. *Nature Cell Biol* **8**:1073-1083.
2. Hoe Suk Kim, Eun Mi Kim, Jiae Lee, Won Ho Yang, Tae Yun Park, Young Min Kim and Jin Won Cho (2006) Heat shock protein 60 modified with

- O-linked N-acetylglucosamine is involved in pancreatic β -cell death under hyperglycemic conditions. *FEBS Letters* **580**: 2311-2316.
3. Hong-Kyung Kim, Jeong-Gu Kang, Shigehiko Yumura, Charles J. Walsh, Jin Won Cho, and Joo Hun Lee (2005) *De novo* Formation of Basal bodies in *Naegleria gruberi*: Regulation by Phosphorylation. *J Cell Biol* **169**:719-724.