New Findings of Translocation of O-GlcNAc Transferase into Nucleus

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O-GlcNAc modification is found in many nuclear and cytoplasmic proteins. This modification is done by O-GlcNAc transferase (OGT). This enzyme is found in nucleus and cytoplasm. Even though this protein exists in nucleus, NLS of this protein has not been identified. And so far we do not know the mechanism how OGT could exist in nucleus and cytoplasm at the same time, if the NLS exists in the protein. The objectives of this research are two folds; identification of NLS of OGT and elucidation of OGT translocation into nucleus. We used ESI-Q TOF mass spectrometry to identify the post translational modifications occurred on OGT. First, we identified specific nuclear localization signal (NLS) in O-GlcNAc transferase that is required for nuclear transport. Also, we show that ncOGT binds importin &#945; protein. Using ESI-Q-TOF mass spectrometry and site-direct mutagenesis we found two O-GlcNAc modification sites. Therefore, O-GlcNAc modification on OGT can change the structure of OGT to be identified by its karyopherins.

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