

Decoding Sweet Regulation

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O-linked *N*-acetylglucosaminylation (O-GlcNAcylation) is an essential glycosylation that dynamically regulates numerous protein functions in response to nutrients and stress. Interestingly, only a single pair of human enzymes maintains the homeostasis of this modification: O-GlcNAc transferase (OGT) and O-GlcNAcase (OGA). Dysregulation of these O-GlcNAc cycling enzymes and the associated cellular O-GlcNAc profile is a common feature across many diseases including cancer. In this talk, I will discuss our efforts to elucidate the structures and mechanisms underlying complex O-GlcNAc biology, and the development of novel chemical probes for biomedical use.