

Title: Chemical approaches to edit post-translational modifications in cells

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Abstract: Nature regulates many biological processes through post-translational modifications that modify protein activity and relay signals through protein networks. Interpretation of how nature uses these modifications will provide new insights to biological regulation, and open new frontiers in the design of therapeutic modalities that mimic nature to treat human disease. We combine the rational design of small molecules and proteins with chemical proteomics technology to tackle key challenges in decoding and editing post-translational modifications. Here, I will describe approaches to write and erase chemical signals on target substrates in cells that in combination with molecular mechanism of action studies have led to the discovery of new regulatory processes through post-translational modifications in biology.

Biosketch: Christina M. Woo is an Associate Professor in the Department of Chemistry and Chemical Biology at Harvard University, and an affiliate member of the Broad Institute. Christina's research focuses on the design of chemical approaches to alter post-translational modifications and the signaling outcomes they produce in cells. She obtained a BA in Chemistry from Wellesley College (2008). She obtained her PhD in 2013 from Yale University under the guidance of Professor Seth Herzon as an NSF predoctoral fellow in the synthetic and chemical biology studies of diazofluorene antitumor antibiotics. In 2013, Christina joined the laboratory of Professor Carolyn Bertozzi at the University of California Berkeley as a Jane Coffins Child postdoctoral fellow and continued at Stanford University (2015) as a Burroughs Wellcome Fund postdoctoral fellow, where she developed a mass-independent chemical glycoproteomics platform for the identification of non-templated post-translational modifications. Christina joined the faculty at Harvard University in 2016. Her research has been recognized by the David Gin Young Investigator Award, Camille-Dreyfus Teacher-Scholar Award, Sloan Research Foundation, NSF CAREER, Bayer Early Excellence in Science Award, the NIH DP1 Avenir Award, and the Ono Pharma Foundation Breakthrough Science Award.

