

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Glycans in the GlyTouCan database (<https://glytoucan.org/>).

File Name: Supplementary Data 2

Description: List of search results for glycopeptide mass spectra from the dataset of mouse tissues (brain, heart, kidney, liver and lung) using Glyco-Decipher.

File Name: Supplementary Data 3

Description: List of modified glycans and modification moieties discovered from the dataset of mouse tissues (brain, heart, kidney, liver and lung) using Glyco-Decipher.

File Name: Supplementary Data 4

Description: List of search results for glycopeptide mass spectra from the dataset of $^{13}\text{C}/^{15}\text{N}$ metabolically labeled yeast using Glyco-Decipher as well as other software tools (StrucGP, pGlyco 3.0, Byonic and MSFragger-Glyco) and analysis results of isotope-based false discovery rate.

File Name: Supplementary Data 5

Description: List of search results for glycopeptide mass spectra from the dataset of human serum using Glyco-Decipher.

File Name: Supplementary Data 6

Description: List of search results for glycopeptide mass spectra from the datasets of SARS-CoV-2 Spike and ACE2 using Glyco-Decipher.

File Name: Supplementary Data 7

Description: Quantification results of the abundance distribution of N-glycosylation on Prosaposin (UniProt: Q61207) in mouse tissues (brain, heart, kidney, liver and lung) using Glyco-Decipher.