Figure S1. MS/MS spectra of peptides with PTMs.

Figure S2. Labeling effeciencies of four representative <sup>15</sup>N-histone H3 peptides. To evaluate the incorporation of <sup>15</sup>N, unpropionylated <sup>15</sup>N-labeled H3 was digested with trypsin and ratios of H/L were quantified using Mascot Distiller. Analysis of raw MS spectra showed at least 99% incorporation suggesting that the labeling process was highly efficient.

Figure S3. Mass analysis of WT and <sup>15</sup>N intact histone H3 illustrating similar profiles and complexity of PTMs.