**Supplemental Figure 1**: Number of distinct Kac and Non-Kac peptides enriched with either individual anti-Kac antibody clones or a mix of all clones (CST).
Supplemental Figure 2: Titration curve data for K-ac and non-K-ac peptides identified after enrichment of indicated peptide input using 50 ug of anti-Kac antibody (CST). Each data point is the average of 3 IP process replicates and error bars represent standard deviation.
Supplemental Figure 3: Titration curve data for K-ac and non-K-ac peptides identified after enrichment of 1 mg of peptide input using indicated amounts of anti-Kac antibody (IMC). Each data point is the average of 2 IP process replicates and error bars represent range.
Supplemental Figure 4: (A) Number of distinct Kac and non-Kac peptides identified in with either the anti-Kac antibody from CST or IMC. Error bars represent the standard deviation for 3 replicates. (B) Overlap of distinct Kac peptides identified for three IP process replicates using the CST anti-Kac antibody. (C) Overlap of distinct Kac peptides identified for three IP process replicates using the IMC anti-Kac antibody. (D) Overlap of distinct Kac peptides identified across 3 IP process replicates using the anti-KAC antibody from CST and IMC.
Supplemental Figure 5: (A) Overlap of sites identified in 3 replicates of our SILAC–labeled SAHA Jurkat dataset with the Choudhary et al. SAHA Jurkat dataset (10). (B) Overlap of sites identified in 1 replicate of our SILAC–labeled SAHA Jurkat dataset with the Choudhary et al. SAHA Jurkat dataset (10). (C) Overlap of Kac proteins identified in our dataset and the dataset of Lundby et al. (12).
Supplemental Figure 6: Frequency plot of the number of acetylation sites identified per protein for 2μM SAHA cells vs. DMSO treated Jurkat cells.
Supplemental Figure 7: Bar graphs illustrate the total number of distinct lysine-acetylated sites (A), peptides (B), and proteins (C) quantified in iTRAQ4-, TMT6-, and TMT10-labeled experiments from luminal and basal breast tumor mouse xenograft samples with 4 mg peptide input per plex. Numbers for individual fractions ("_1" to ",_4") and the complete experiment ("_all") are shown.
Supplemental Table 1:

CST anti-Kac antibody development

Tab 1: “ELISA analysis summary”- Absorbance values for ELISA analysis of seven clones in the CST anti-Kac lysine reagent.

Tab 2-Tab 8: “Unique Kac Peptides Clone 1-7”-Distinct Kac peptides identified for each of the seven clones comprising CST anti-Kac antibody.

Tab 9: “Unique Kac Peptides Combined Ab”-Distinct Kac peptides identified in the combined CST anti-Kac antibody.

Supplemental Table 2:

Titration Curves Analysis and CST vs IMC comparison

Tab 1: “Summary CST Ab Input Titration”- Summary of distinct Kac and Non-Kac peptides identified for variable amounts of CST anti-Kac antibody with 2 mg of Jurkat peptide input.

Tab 2: “CST Ab Titration Curve”-MaxQuant MS/MS “evidence” table of distinct peptides for all replicates of CST anti-Kac antibody titration curve data.

Tab 3: “Summary Protein Input Titration”- Summary of distinct Kac and Non-Kac peptides identified across all titration experiments where protein input amount was varied and CST anti-Kac antibody amount was kept constant.

Tab 4: “Protein Input Titration”-MaxQuant MS/MS “evidence” table of distinct peptides for all replicates of protein titration curve data.

Tab 5: “Summary IMC Titration”- Summary of distinct Kac and Non-Kac peptides identified for variable amounts of IMC anti-Kac antibody with 1 mg of Jurkat peptide input.

Tab 6: “IMC Titration Curve”- MaxQuant MS/MS “evidence” table of distinct peptides for all replicates of IMC anti-Kac antibody titration curve data.

Tab 7: “Summary CST Ab vs IMC Ab”-Summary of distinct Kac and non-Kac peptides identified in the comparison study between CST anti-Kac antibody and IMC anti-Kac antibody.

Tab 8: “CST Ab vs IMC Ab”- MaxQuant MS/MS “evidence” table of distinct peptides for all replicates of CST anti-Kac antibody and IMC anti-Kac antibody comparison study.
Supplemental Table 3:

SAHA Treated Jurkat Experiments

Tab 1: “Summary_Jurkat_SAHA”-Table summarizes the number of distinct Kac and Non-Kac peptides found in bRP fractionated and non-fractionated SAHA treated Jurkat samples.

Tab 2: “All_Jurkat_SAHA_KacPeptides”-MaxQuant MS/MS “Evidence” table for all replicates of bRP fractionated and non-fractionated SAHA treated Jurkat samples.

Tab 3: “bRPFxn_Jurkat_SAHA_Kac_Sites”-Kac site data for all replicates of bRP fractionated SAHA treated Jurkat samples.

Tab 4: “NonFxnx_Jurkat_SAHA_Kac_Sites”-Kac site data for all replicated of non-fractionated SAHA treated Jurkat samples.

Supplemental Table 4:

iTRAQ and TMT data

Tab 1: “Summary_iTRAQ_TMT”-Summary of Kac proteins and quantified and localized Kac peptides and sites identified in the iTRAQ and TMT experimental dataset.

Tab 2: “Kac_iTRAQ”-Kac sites for the luminal and basal breast cancer samples labeled with iTRAQ4.

Tab 3: “Kac-TMT6”-Kac sites for the luminal and basal breast cancer samples labeled with TMT6.

Tab 4: “Kac_TMT10”- Kac sites for the luminal and basal breast cancer samples labeled with TMT10.