Supplementary Figure Legends

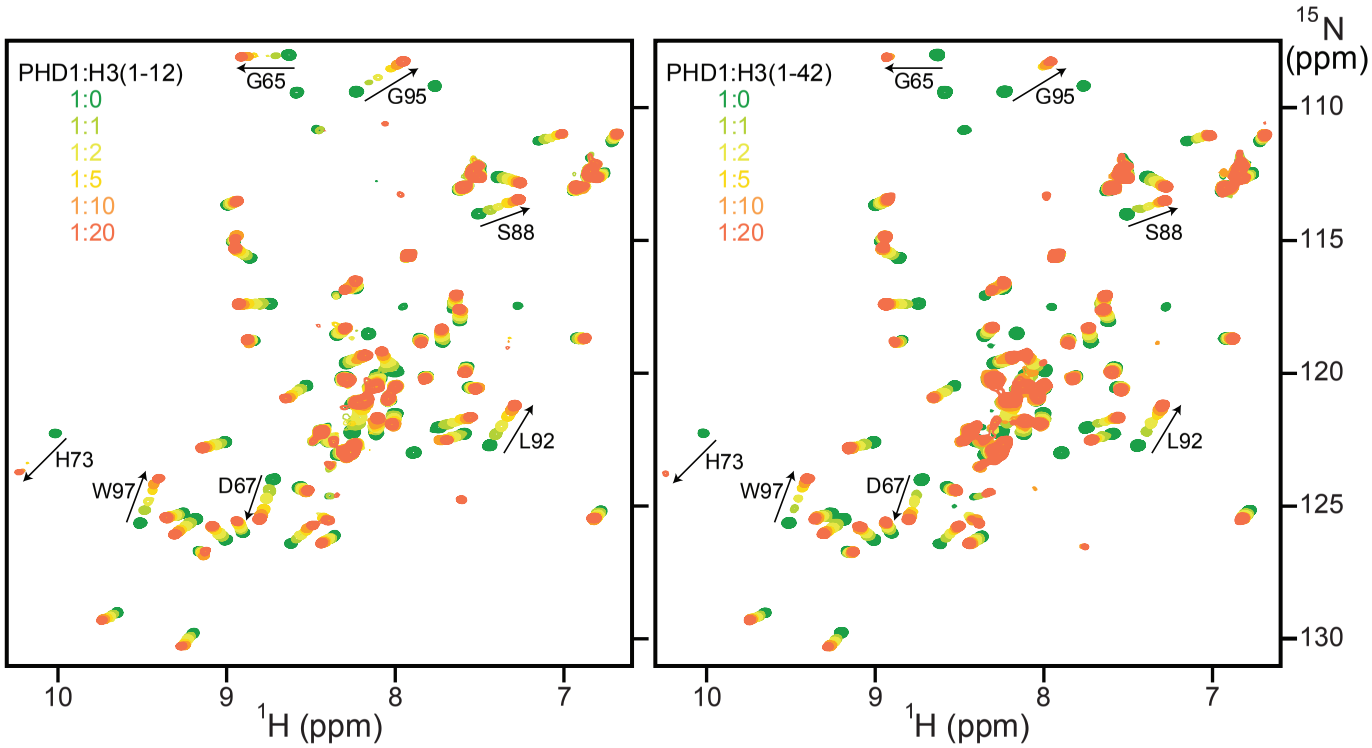
Figure S1: Unmodified H3 peptides of varying lengths, but harboring an intact N-terminus, induce similar perturbations in the Pf1 PHD1 NMR spectrum. ^{1}H-^{15}N correlated spectra of ^{15}N-labeled Pf1 PHD1 resulting from titrations with increasing amounts of H3 (1-12) (*left*) and H3 (1-42) (*right*). Titrations were conducted at a concentration of 100 μM Pf1 PHD1 in NMR buffer comprising 20 mM Tris-d_{11} (pH 7.0), 50 mM NaCl, 10 μM $ZnSO_4$, 15 mM DTT, and 0.2% NaN_3 at 25 °C.

Figure S2: Backbone amide chemical shift deviations in Pf1 PHD1 induced by histone H3 (1-12) and H3 (1-42) peptides graphed as a function of residue number. The chemical shift changes in the PHD domain induced by the peptides at 20-fold excess (i.e. the final titration point in Fig. 2) are shown in black and gray, respectively. Strongly perturbed residues are labeled. Amide proton resonances in fast exchange with solvent are denoted by 'x's; prolines are denoted by 'P's; the star denotes a resonance that is severely exchange broadened.

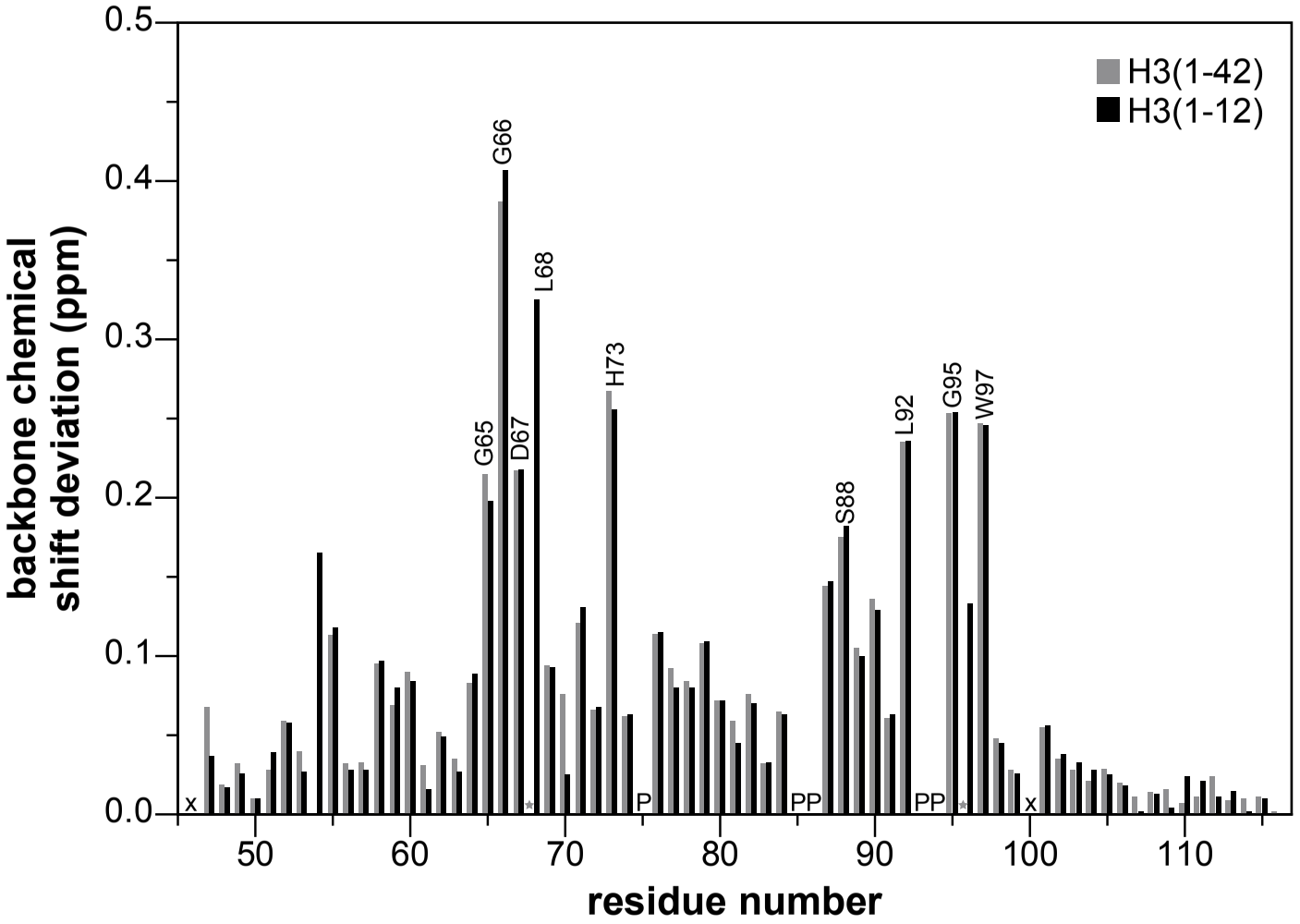
Figure S3: ^{1}H-^{15}N correlated spectra demonstrating the absence of a direct interaction between the MRG15 CD and Pf1 PHD1 domains. Overlays of the spectra recorded for the individual PHD1 (red) and CD (magenta) domains with that of an equimolar mixture of ^{15}N-MRG15 CD and ^{15}N-Pf1 PHD1; the sample of the 1:1 mixture was used for the H3 peptide titrations shown in Fig. 4. Spectra were recorded under identical solution conditions (in NMR buffer comprising 20 mM Tris (pH 7.5), 50 mM NaCl, 10 μM $ZnSO_4$, 15 mM DTT, and 0.2% NaN_3 at 25 °C) and were processed and displayed with the same parameters.

Figure S4: Expanded plots of 1D ^{1}H NMR spectra of 1:1 mixtures of ^{15}N-MRG15 CD and ^{15}N-Pf1 PHD1 (red; *top*) and of ^{15}N-PHD1/MBD and full-length MRG15 (black; *bottom*). Well-resolved MRG15 CD and Pf1 PHD1 resonances are annotated in blue and green, respectively. It is apparent that unlike the Pf1 PHD1 resonances (also see Fig. 5a), those of MRG15 CD remain unperturbed. These spectra were recorded in NMR buffer comprising 20 mM Tris (pH 7.5), 50 mM NaCl, 10 μM $ZnSO_4$, 15 mM DTT, and 0.2% NaN_3 at 25 °C.

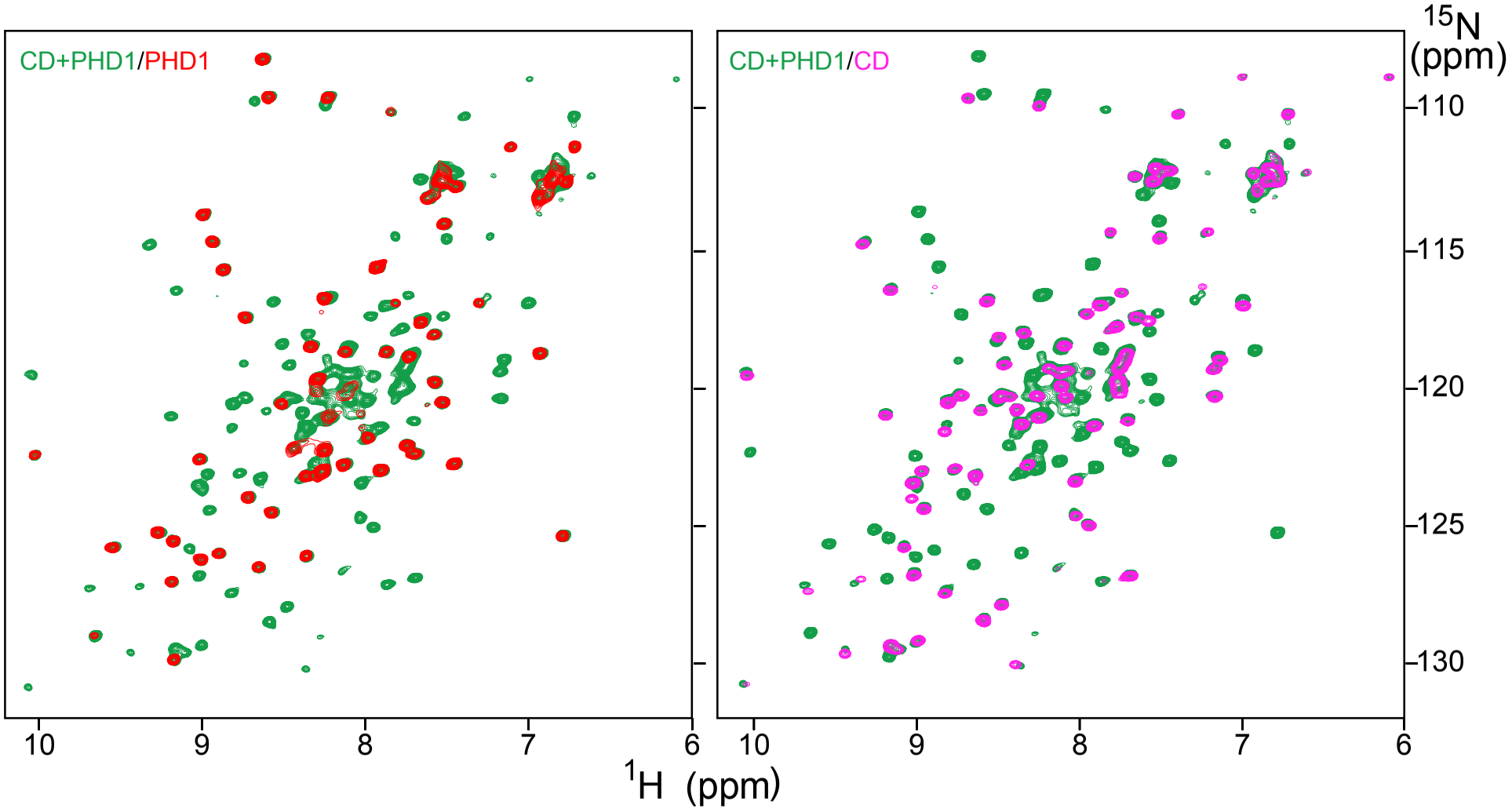
Figure S5: Pf1 PHD1 simultaneously engages the MRG15-Pf1 MBD complex and H3K36Cme3 (1-42). ^{1}H-^{15}N correlated spectra of ^{15}N-labeled Pf1 PHD1 prior to (*black*) and following addition of one equivalent of the H3K36Cme3 (1-42) peptide (*red*). Both spectra were recorded in the presence of an equivalent amount of full-length MRG15 and Pf1 MBD in NMR buffer comprising 20 mM Tris (pH 7.5), 50 mM NaCl, 10 μM $ZnSO_4$, 15 mM DTT, and 0.2% NaN_3 at 25 °C. The spectra were recorded under identical solution conditions and were processed and displayed with the same parameters.



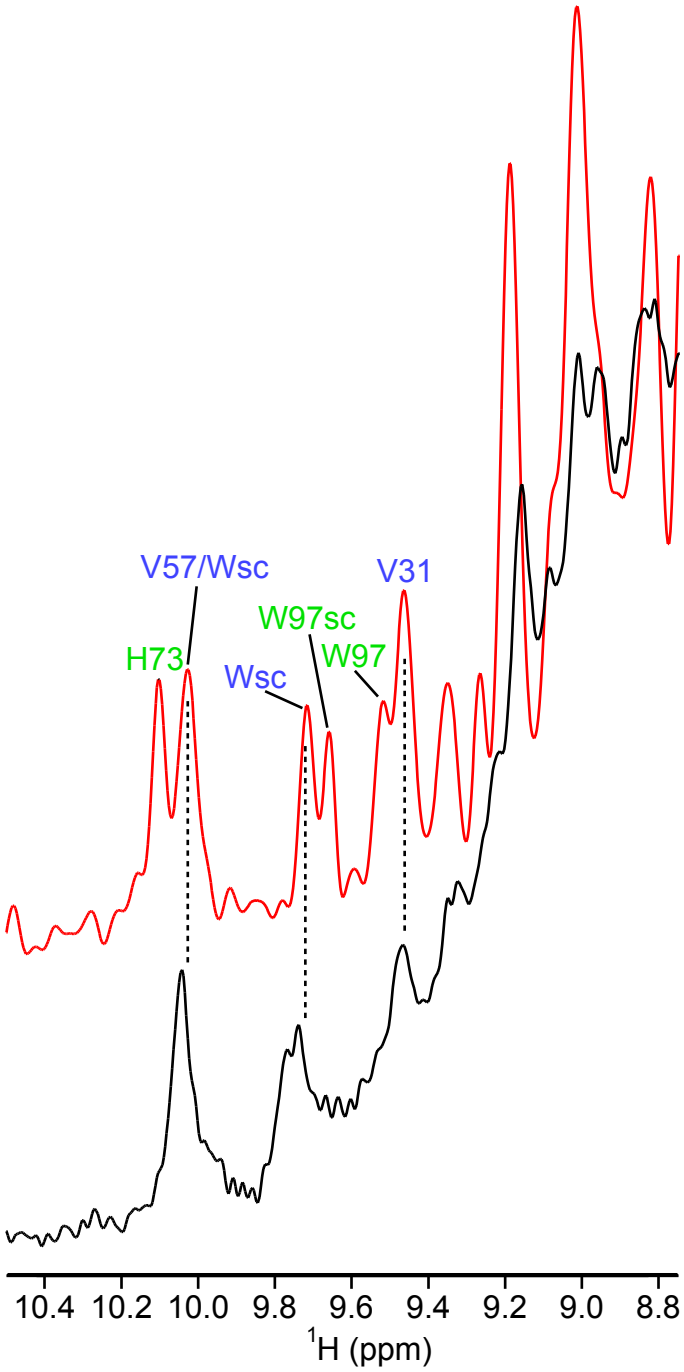
Supplementary Figure S1



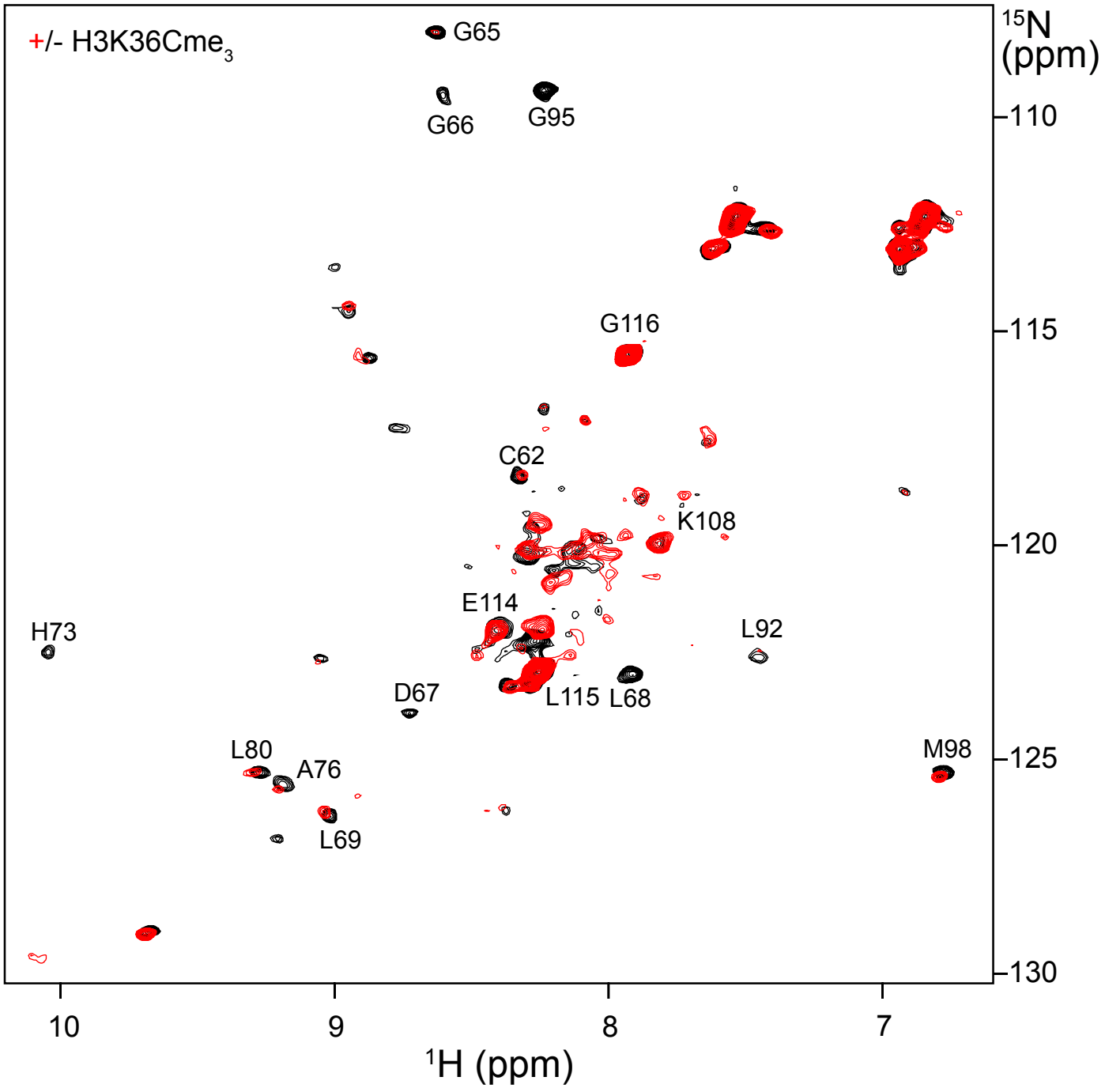
Supplementary Figure S2



Supplementary Figure S3



Supplementary Figure S4



Supplementary Figure S5