**SUPPLEMENTARY FIGURE LEGENDS**

**Supplementary Figure S1.** Determination of the residues involved in zinc coordination using NMR. (A) $^{1}H$-$^{15}N$ correlated HMQC spectrum of SAP30 ZnF loaded with $Zn^{2+}$ (black) or $^{113}Cd^{2+}$ (red). The lines link correlations within each spin system. Resonance assignments are indicated. (B) Expanded contour plots of a constant-time $^{1}H$-$^{13}C$ HSQC of SAP30 ZnF highlighting $^{1}H^{\beta}$-$^{13}C^{\beta}$ correlations corresponding to the four cysteine residues. The lines connect correlations involving each pair of methylene protons.

**Supplementary Figure S2.** Structural effects of single-site alanine mutations in the SAP30 ZnF motif probed by 2D $^{1}H$-$^{15}N$ HSQC spectra. Overlays of HSQC spectra acquired in the absence (black) and the presence of one equivalent of zinc (red) for the (A) Cys67Ala, (B) Cys68Ala, (C) His108Ala and (D) Cys112Ala mutants. Note the increased spectral dispersion upon zinc addition in panels B and C.

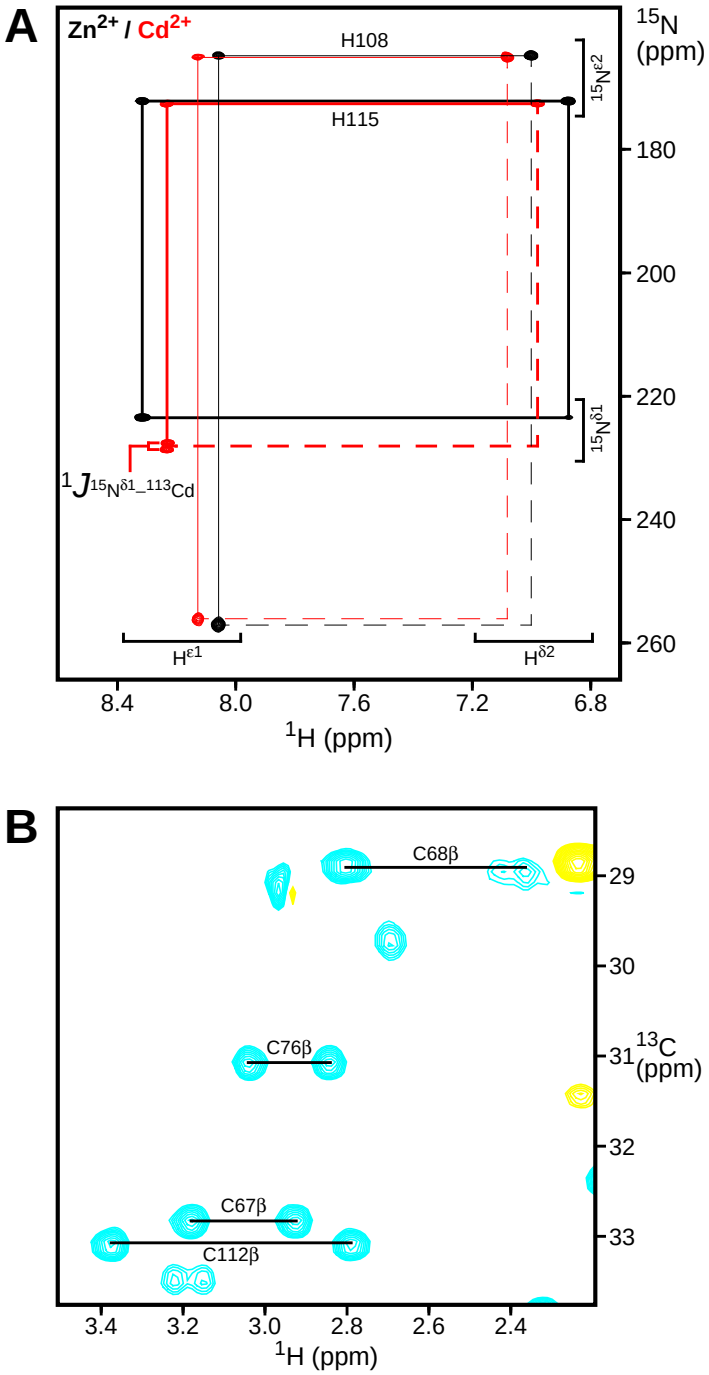
**Supplementary Figure S3.** The SAP30 ZnF is structurally independent from the SAP30 Sin3 interaction domain. $^{1}H$-$^{15}N$ HSQC spectra of (A) SAP30 ZnF (residues 64-131), (B) SAP30 ΔN (residues 64-220) complexed with mSin3A PAH3, and (C) an overlay of the two spectra recorded at 25 °C. Protein concentrations were 0.2 mM in both cases. Identical NMR data acquisition, processing, display, and contouring threshold parameters were used. Minor differences in peak positions for Asn82, Phe85, Ser86, and Val98 are attributed to differences in salt content in the two samples.

**Supplementary Figure S4.** A graph of the $\{^{1}H\}$-$^{15}N$ heteronuclear NOEs to assess the flexibility of the polypeptide backbone. The error bars represent the standard deviations from three independent measurements. A cartoon depicting the locations of the secondary structural elements is provided for reference.

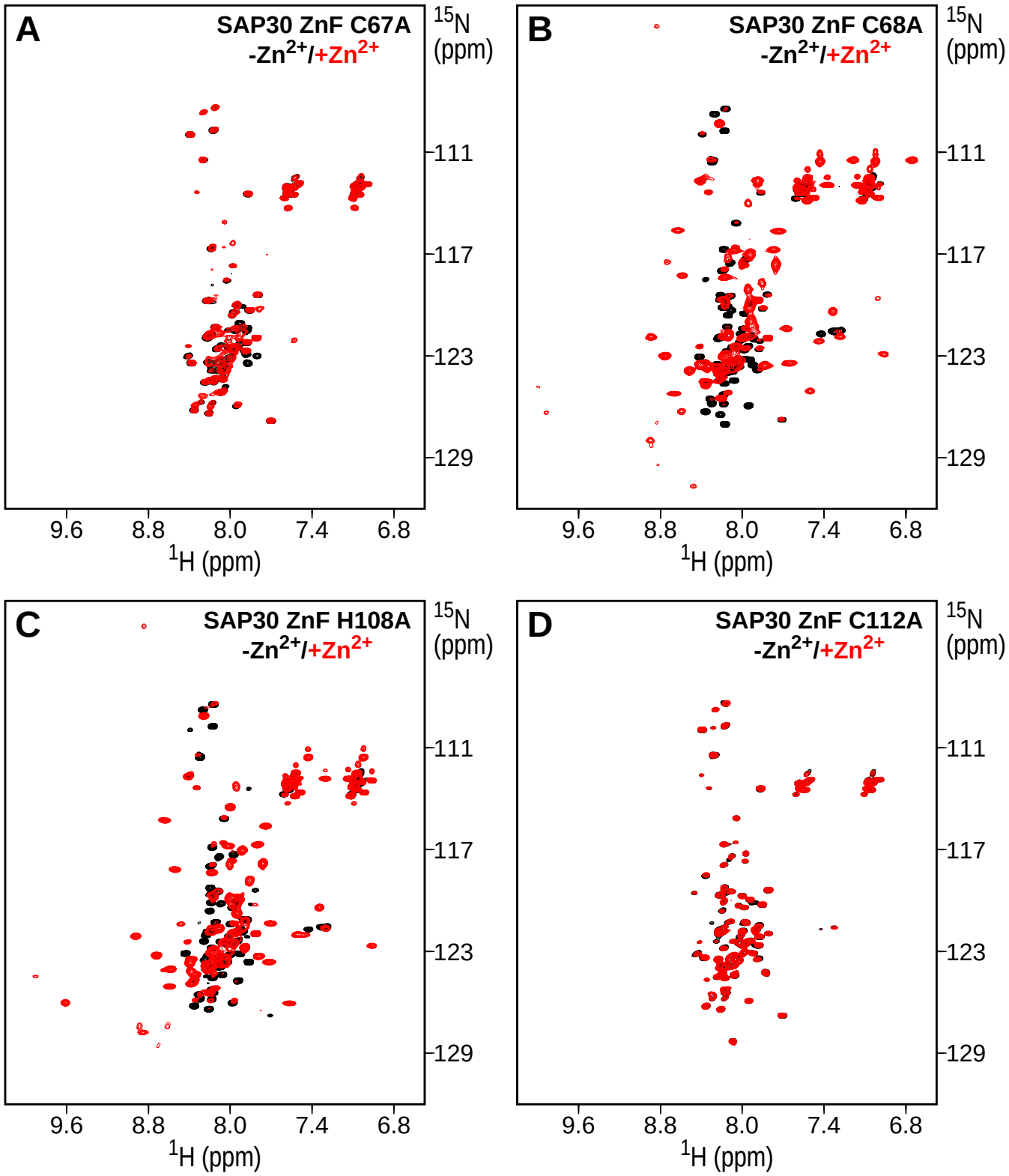
**Supplementary Figure S5.** Analysis of phospholipid-binding by SAP30 ZnF. Purified $His_6$-tagged SAP30 ZnF was incubated with a panel of phospholipids that were immobilized on to a surface. The identities of the phospholipids are given in the schematic (*left*) while SAP30 ZnF

binding was assessed using a combination of an antibody directed against the $His_6$-tag and a chemiluminescent-based detection scheme (*right*).

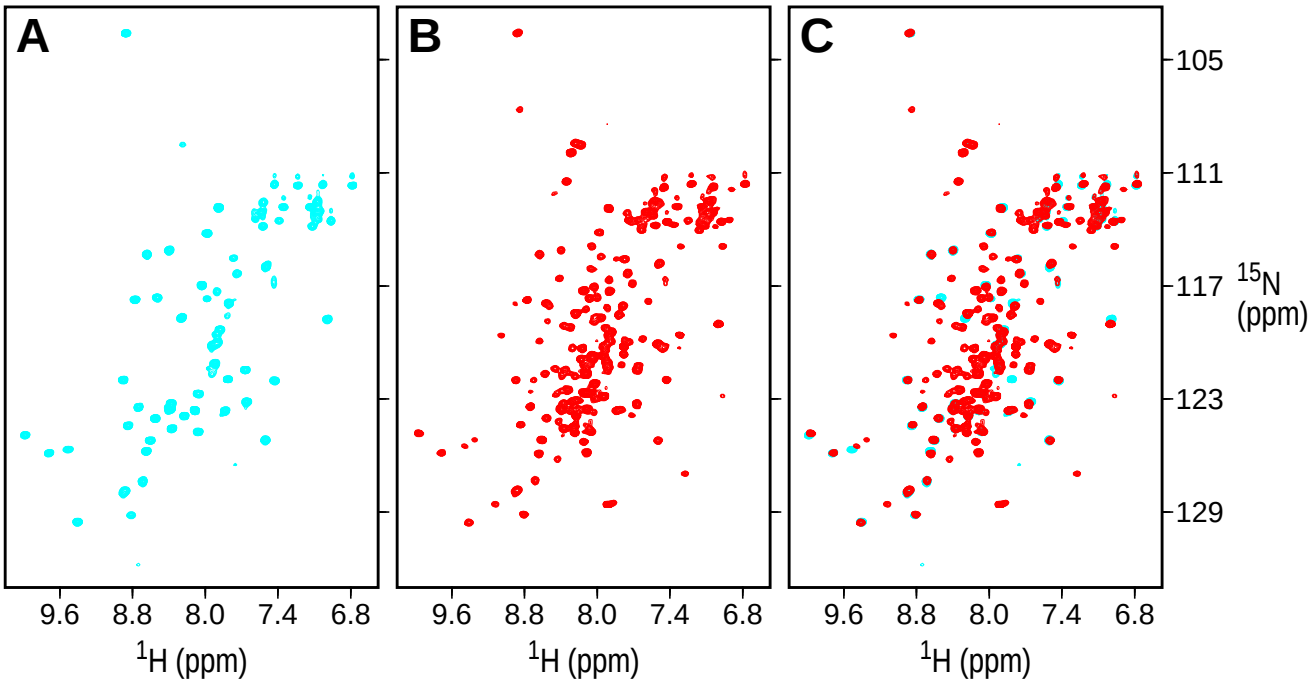
# Supplementary Figure S1



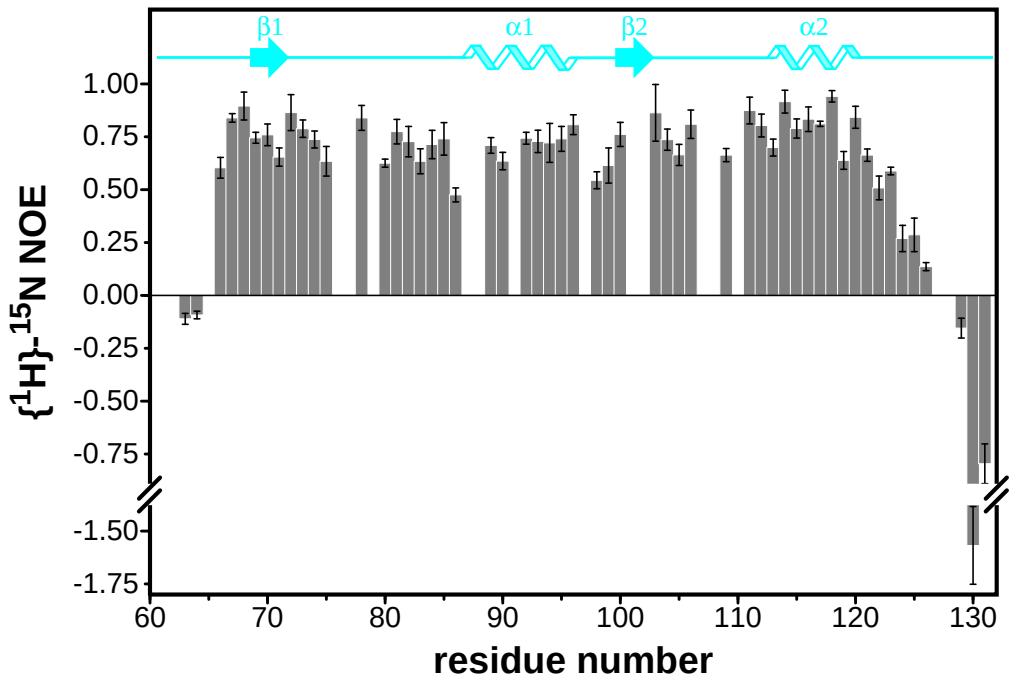
# Supplementary Figure S2



# Supplementary Figure S3



Supplementary Figure S4



# Supplementary Figure S5