

**Additional file 4**

Mutations of Brd2 BD2	Amide resonances disturbed from mutations
V329A	residues including W323 to M347 in the ZA loop, L349 and T351 in the amino terminus of helix $\alpha$ A, M374 to Y381 in the carboxy terminus of helix $\alpha$ B, N382 and D387 in the BC loop.
L334A	residues including D330 to D341
L336A	residues including K327 to M347 in the ZA loop, L349 and T351 in the amino terminus of helix $\alpha$ A, S376 and C378 to N382 in the carboxy terminus of helix $\alpha$ B and in the BC loop.
N382A	residues including W323 to M347 in the ZA loop, L349 and T351 in the amino terminus of helix $\alpha$ A, R372 to F399 comprised the carboxy terminus of helix $\alpha$ B, the BC loop and the amino half of helix $\alpha$ C.