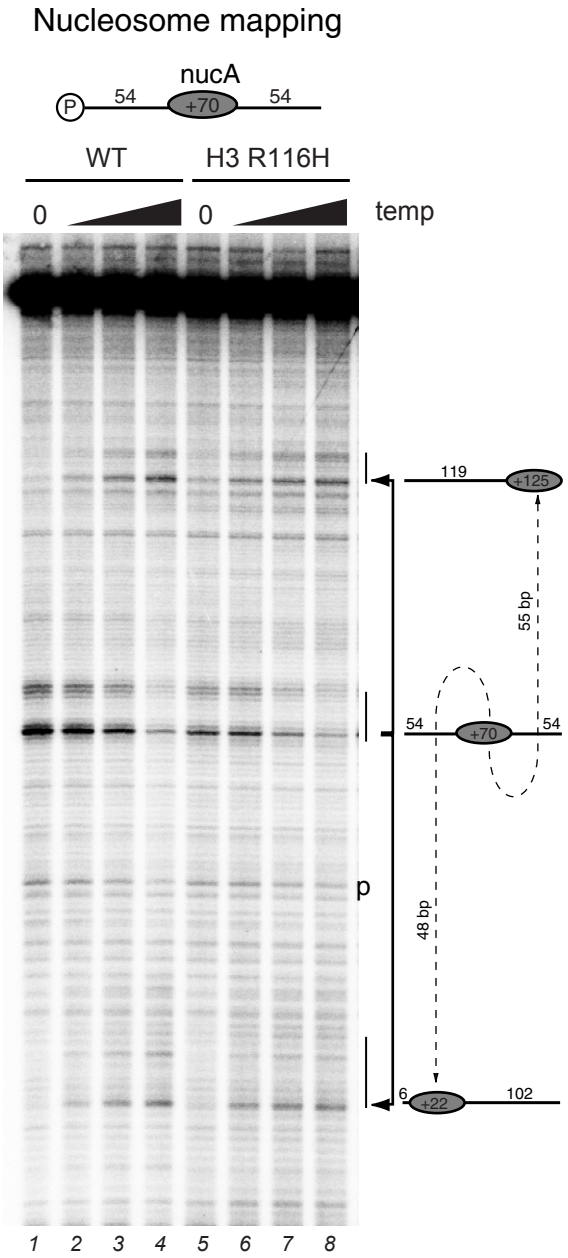
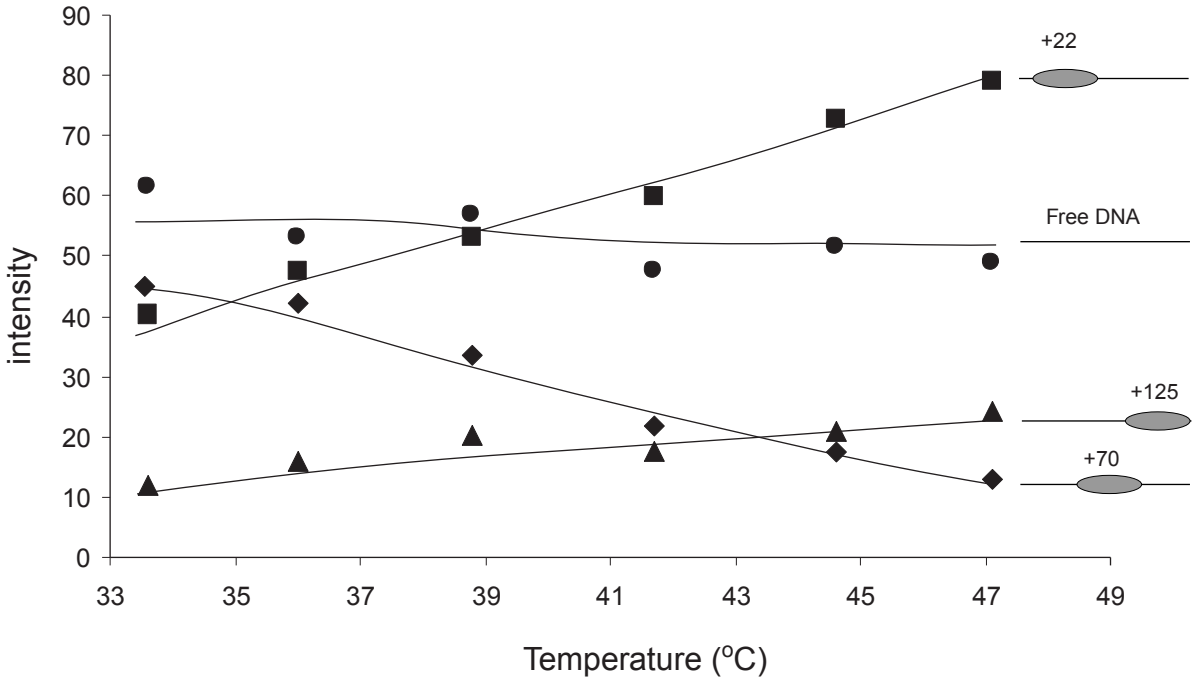
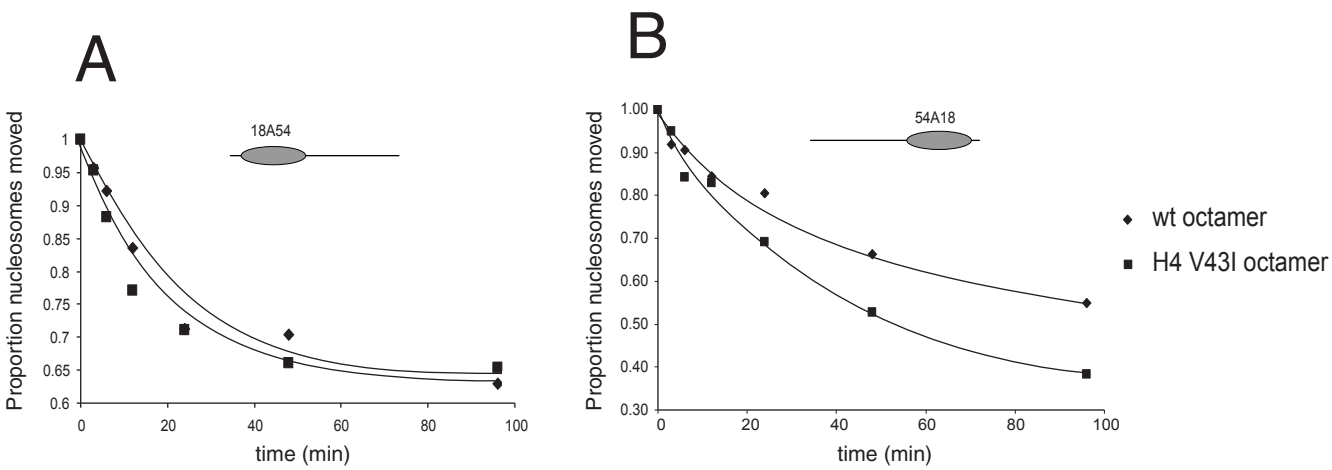


Supplementary Figure 1: *Site directed mapping of sin mutant nucleosomes.* In order to determine whether sin mutant nucleosomes are redistributed to the same positions as wt nucleosomes, octamers were made that contained the H3 R116H sin mutation and the nucleosome mapping reagent attached to H4 S47C. The pattern of cleavage observed with the sin mutant and wt nucleosomes are similar apart from slightly reduced cleavage at the +125 location following incubation at 0, 32, 36, and 41oC (lanes 1-4 and 5-8 respectively). This is consistent with the H3 R116H mutation causing nucleosomes to be repositioned to the same locations, but with a reduction in the proportion of nucleosomes observed at +125 relative to +22. This was also observed in gel shift assays as indicated by the 3.3-fold enrichment for the upstream position in Table 1.



Supplementary Figure 2: *Quantitative analysis of all species during thermal redistribution of H3 R116H nucleosomes.* Following thermal incubation at the temperatures indicated, the proportion of nucleosomes at each location was determined by quantitation of the bands present in each location using a fluorescent imager. Although an increase in the proportion of free DNA is observed when nucleosomes are subject to thermal incubation, even at temperatures lower than 30oC where little thermal redistribution is observed, little additional dissociation was observed between 33 and 47oC. However, during incubation over this range of temperatures a significant reduction in the nucleosomes present at the original (+70) location is observed that coincides with an increase in the signal detected at the new locations (+22 and +125). This is consistent with the asymmetric redistribution giving rise to the preferential accumulation of nucleosomes at +22 rather than selective dissociation of one of the products.



Supplementary Figure 3: *Unidirectional redistribution of H4 V43I mutant nucleosomes.* In order to compare the redistribution of nucleosomes in the upstream and downstream directions, DNA fragments were designed such that nucleosomes were positioned close to one end. **A** On the 54A18 fragment nucleosomes move in the downstream direction (data not shown) and little difference is observed in the time at 46ºC required to shift wt (diamonds) and H4 V43I nucleosomes (squares).**B** On the 18A54 fragment, nucleosomes move in the upstream direction (data not shown). In this case, H4 V43I octamers (squares) are relocated more rapidly than wt octamers (diamonds) at 54ºC. This is consistent with the preferential accumulation of the H4 V43I mutant octamers at the upstream end of symmetrical DNA fragments that was observed in Figure 3. It suggests that sin mutant octamers preferentially relocate on some DNA sequences.