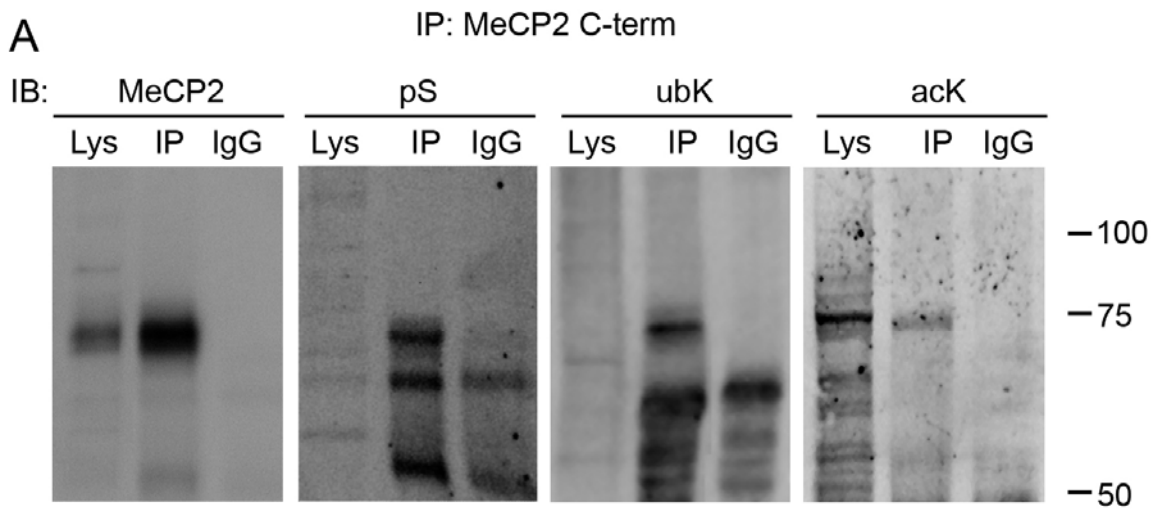
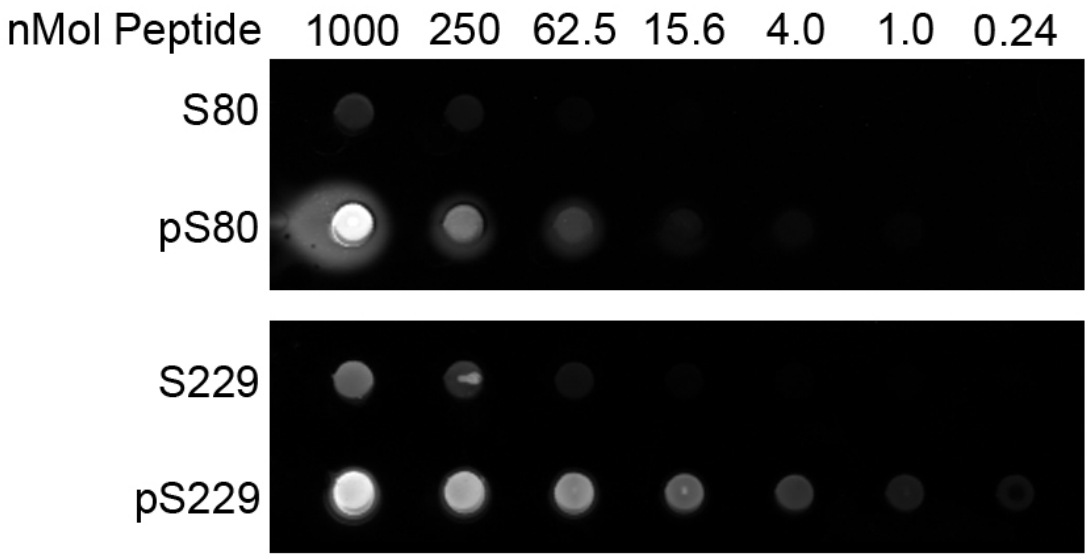
Supplemental Table 1: Primers used in qPCR

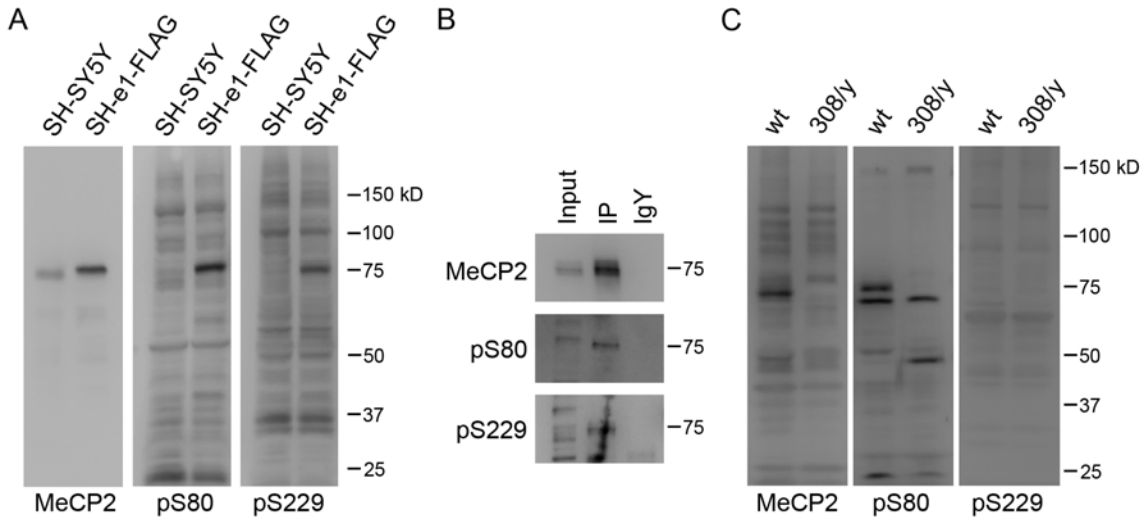
| | |
|---|---|
| RET exp fw | 5′ TGCATCCAGGAGGACACC 3′ |
| RET exp rv | 5′ TTGAGGTAGACGGTGAGCAG 3′ |
| EGR2 exp fw | 5′ CGGTGACCATCTTTCCCAAT 3′ |
| EGR2 exp rv | 5′ TGGGAGATCCAACGACCTCT 3′ |
| GAPDH exp fw | 5′ TGAACCATGAGAAGTATGACAAC 3′ |
| GAPDH exp rv | 5′ GTCCTTCCACGATACCAAAG 3′ |
| Egr2 pro fw | 5′ ctccttttgcttgcggtttt 3′ |
| Egr2 pro rv | 5′ ggagccattccggaaaatta 3′ |
| Egr2 int fw | 5′ atggtgccaaaccgagag 3′ |
| Egr2 int rv | 5′ gggactccttcctctacatcc 3′ |
| RET enh fw | 5′ GTGGCAGACAGATGGGAAAC 3′ |
| RET enh rv | 5′ AGTGTGACATGGTGGTTGGA 3′ |
| RET pro fw | 5′ ACCCCAGGATGCTGAAAAAG 3′ |
| RET pro rv | 5′ GCCATTTCTCAGAGGCGAGA 3′ |
| Line-1 fw | 5′ GCCATCATCCTCAGCAAACT 3′ |
| Line-1 rv | 5′ TTCCCCTCCCTGTGTCTATG 3′ |
| 15qBP fw | 5′ ACAGCCCTAGAGTTCCAGCA 3′ |
| 15qBP rv | 5′ CTGGTCAGCCAAGACTCACA 3′ |
| Alu fw | 5′ AGCATGTGATGATTTGGGTTT 3′ |
| Alu rv | 5′ GGGATTACAGGCAAGATCCA 3′ |



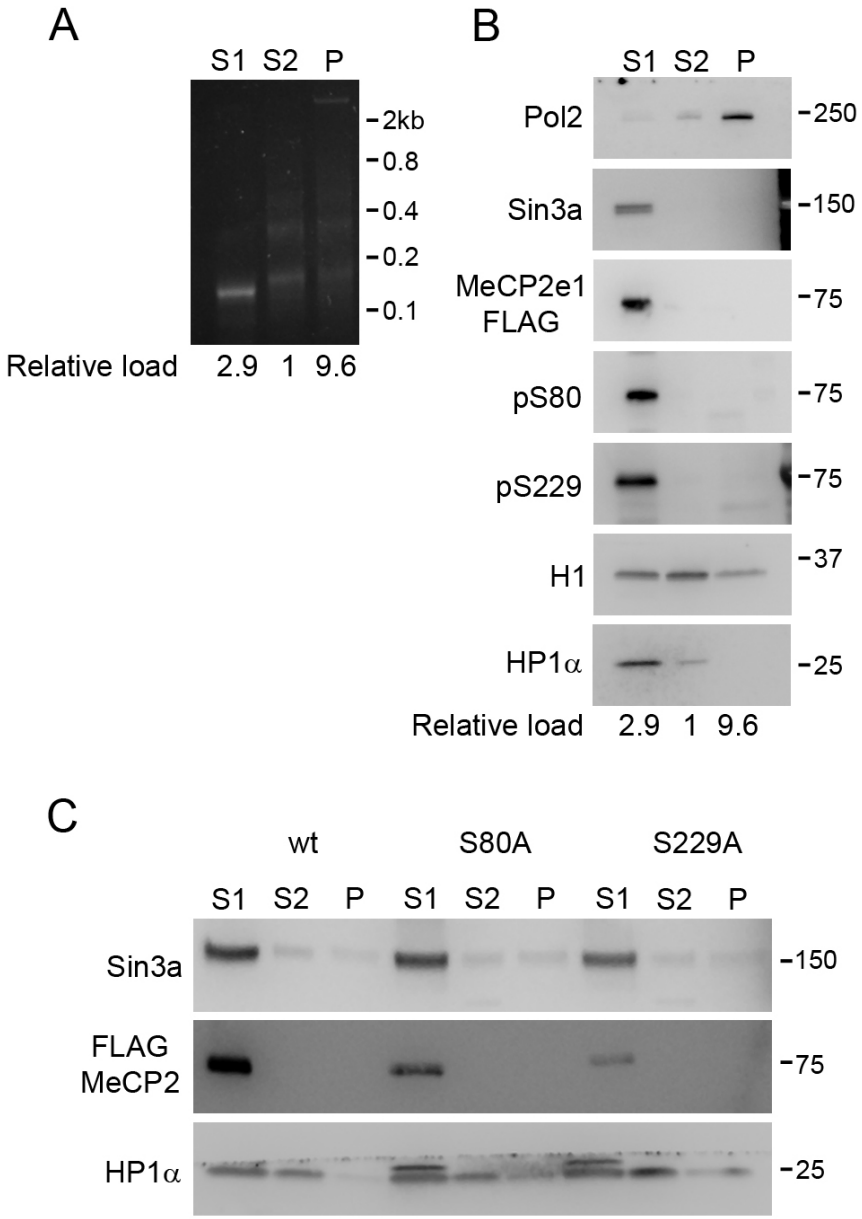

**Supplemental Figure 1** Western blot analysis of MeCP2 immunoprecipitates from SH-SY5Y nuclear extracts with antibodies against MeCP2, phosphorylated serine (pS), ubiquitylated lysine (ubK), or acetylated lysine (acK).



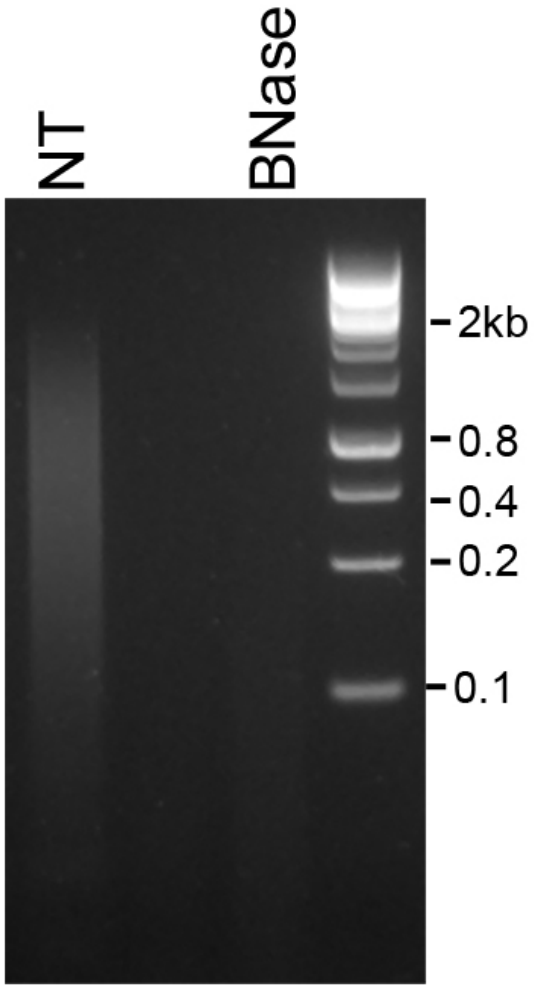

**Supplemental Figure 2** Dot blot analysis showing Indicated amounts of unmodified (S80, S229) and phosphorylated peptides (pS80, pS229) were spotted on nitrocellulose and probed with the corresponding phospho-MeCP2 antibody (see materials and methods for peptide sequences). Blots were visualized and quantified using an Odyssey infrared imaging system (Li-cor Biosciences).



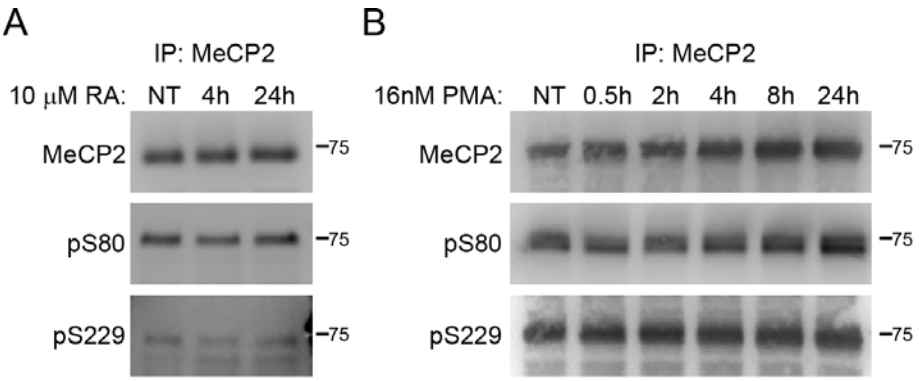

**Supplemental Figure 3** A) Western blot analysis of total protein extracts from SHSY5Y cells and SH-SY5Y cells expressing FLAG epitope tagged MeCP2e1 (SH-e1-FLAG). B) Western blot analysis of endogenous MeCP2 immunoprecipitated with an antibody against total MeCP2 from SH-SY5Y nuclear extracts with the indicated antibodies. C) Western blot analysis of total protein extracts from 5 week old wild type and MeCP2 308/y mutant mouse brain.



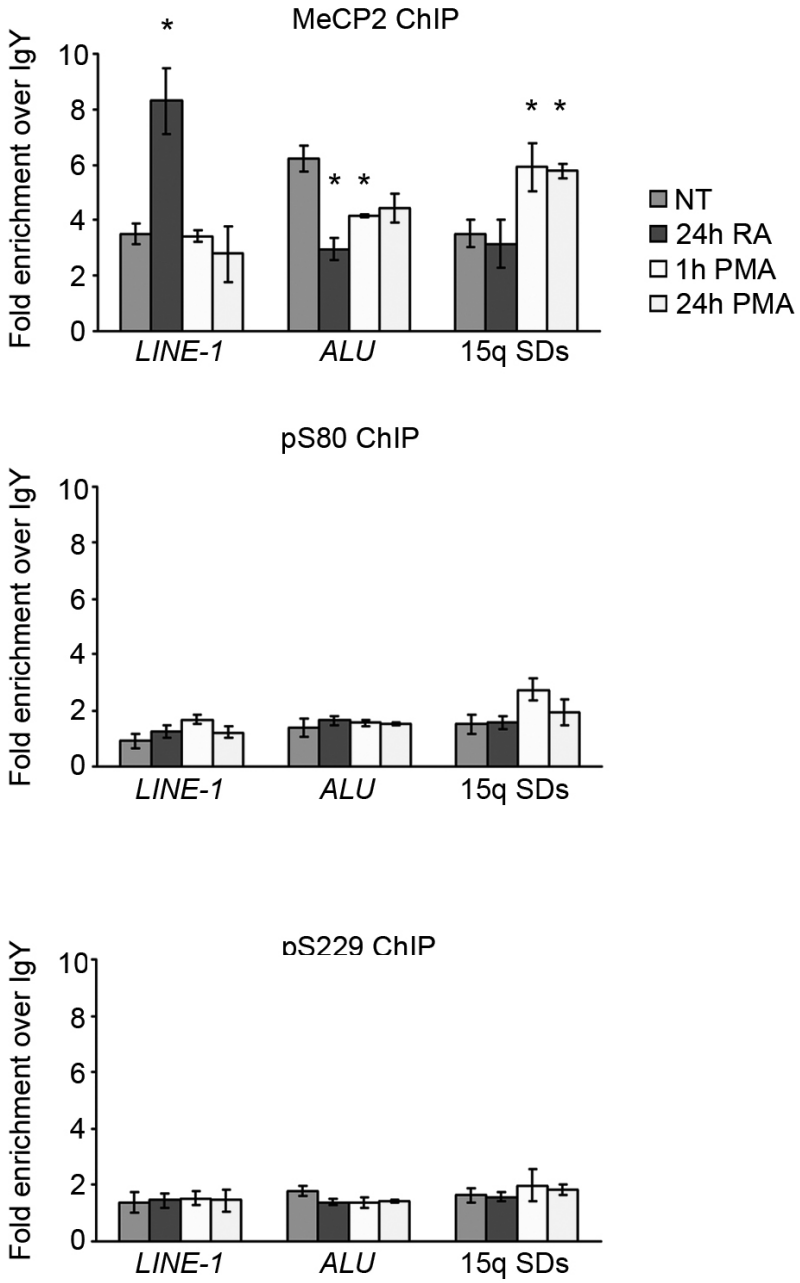

**Supplemental Figure 4** Gel electorphoresis of 25 ng DNA (A) and western blot analysis (B) of protein loaded to correspond to equal amounts of DNA input of MNase nuclear fractions from SH-SY5Y MeCP2e1-FLAG stably expressing cells. Numbers below panels indicate relative amount of each fraction loaded. C)Western blot analysis of MNase nuclear fractions from SHSY5Y cell lines stably expressing wild type or mutant (S80A, S229A) MeCP2e1-FLAGwith the indicated antibodies.




**Supplemental Figure 5** Benzonase digestion of genomic DNA from SH-SY5Y nuclear lysates. Lysates were treated with Benzonase (see materials and methods) and DNA was isolated by Phenol:Chloroform extraction and ethanol precipitation. Equal volumes of DNA were loaded for analysis by agarose gel electrophoresis.




**Supplemental Figure 6** Western blot analysis of endogenous MeCP2 innunoprecipitated with an antibody against total MeCP2 from SH-SY5Y nuclear extracts after treatment of the cells with A) 10 μM RA or B) 16nM PMA for the indicated times




**Supplemental Figure 7** ChIP with total MeCP2, pS80 MeCP2, and pS229 MeCP2 antibodies analyzed by quantitative PCR at the indicated sites, expressed as fold enrichment over non-specific IgY untreated SH-SY5Y cells (NT) or cells treated as indicated. Error bars represent SEM. (* $P<0.05$ vs no treatment)