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# Supporting Information

## Design and Evaluation of Nanoscale Materials with Programmed Responsivity towards Epigenetic Enzymes

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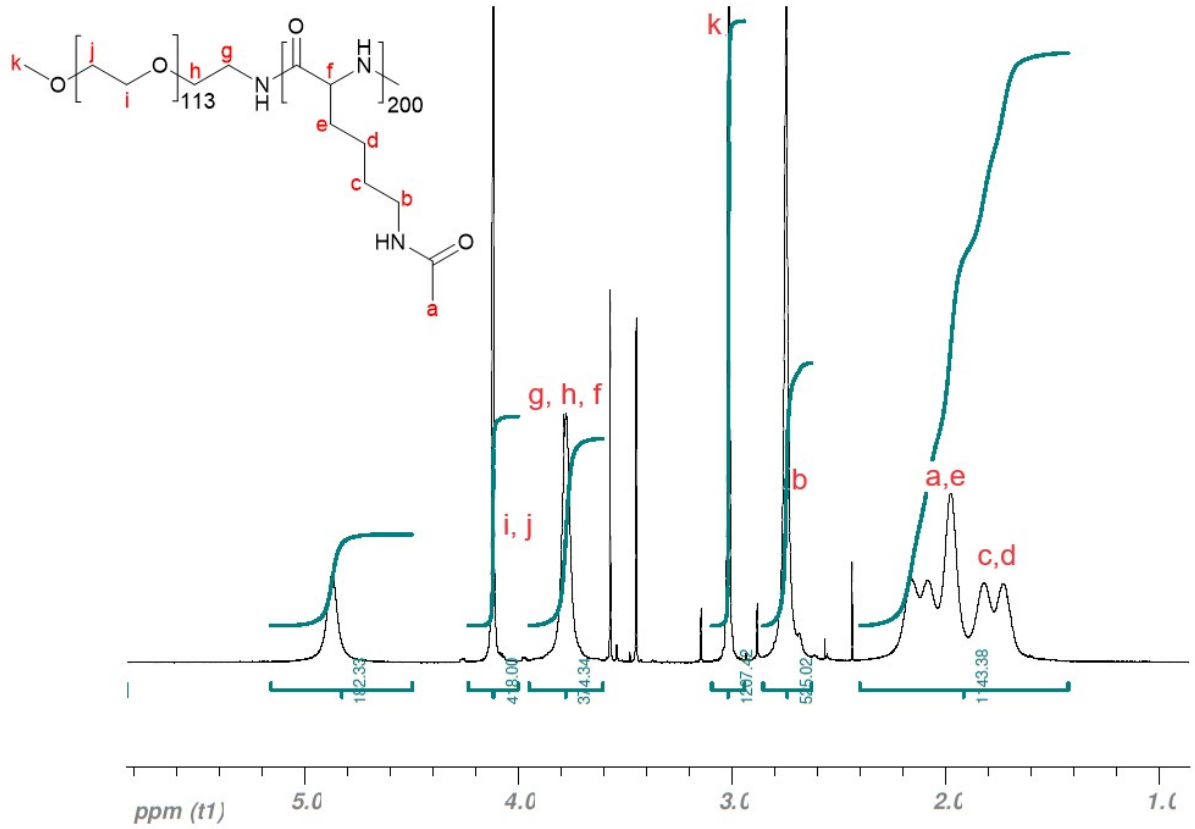


**Figure S1A:** [1]H NMR spectrum of acetylated PEG-b-poly(L-lysine) in TFA-*d*

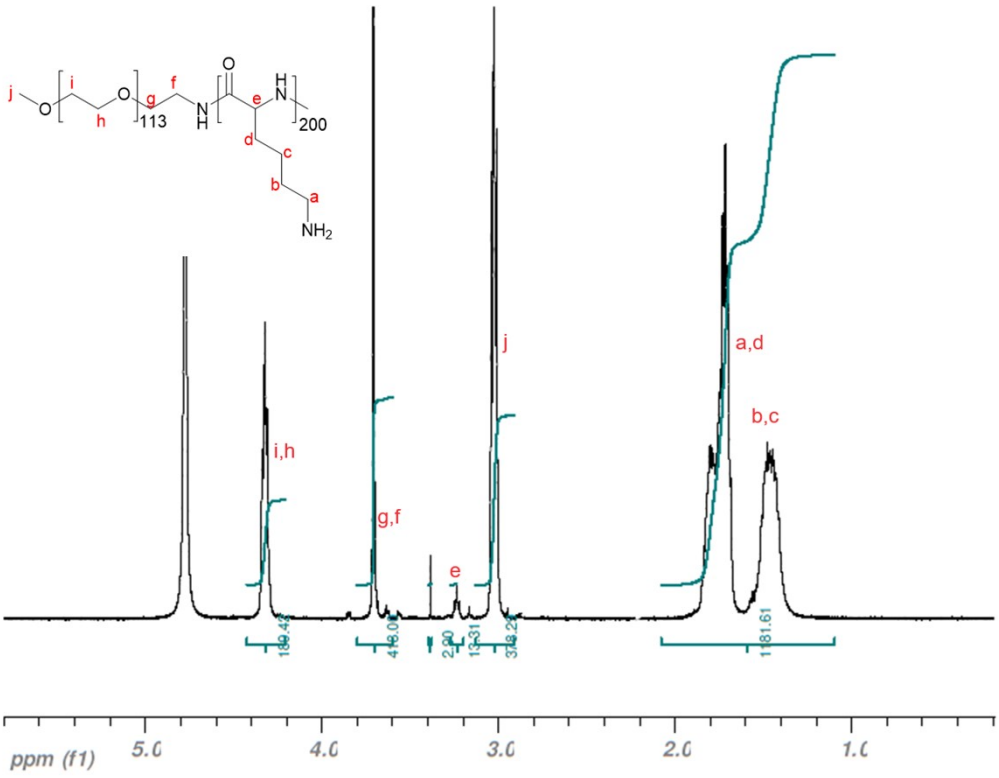


**Figure S1B:** [1]H NMR spectrum of the starting material, PEG-b-poly(L-lysine).

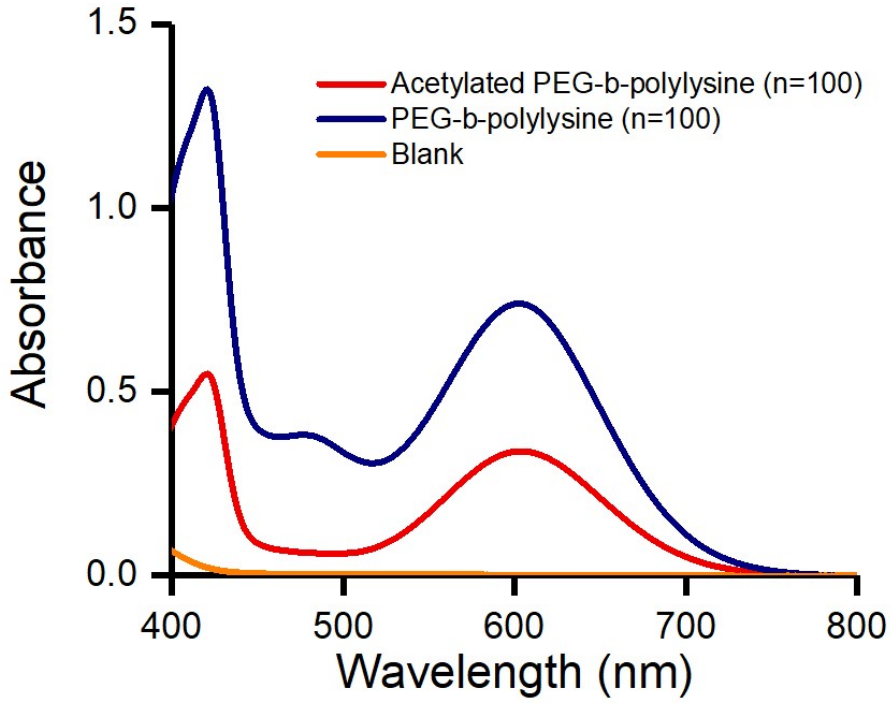


**Figure S2.** Absorbance spectra of block copolymers pre- and post-deacetylation using the ninhydrin test. The Ninhydrin test clearly shows the reduction of absorbance intensity originated from primary amines of PEG-block-poly(L-lysine) block copolymers due to acetylation. The Ninhydrin test using the wavelength of 570 nm was used to quantify and the percentage functionalization was calculated using the following equation:

$$mg\ of\ \alpha - amino\ acid = \frac{Abs_{\text{test}} - Abs_{\text{blank}}}{Abs_{\text{standard}} - Abs_{\text{blank}}}$$

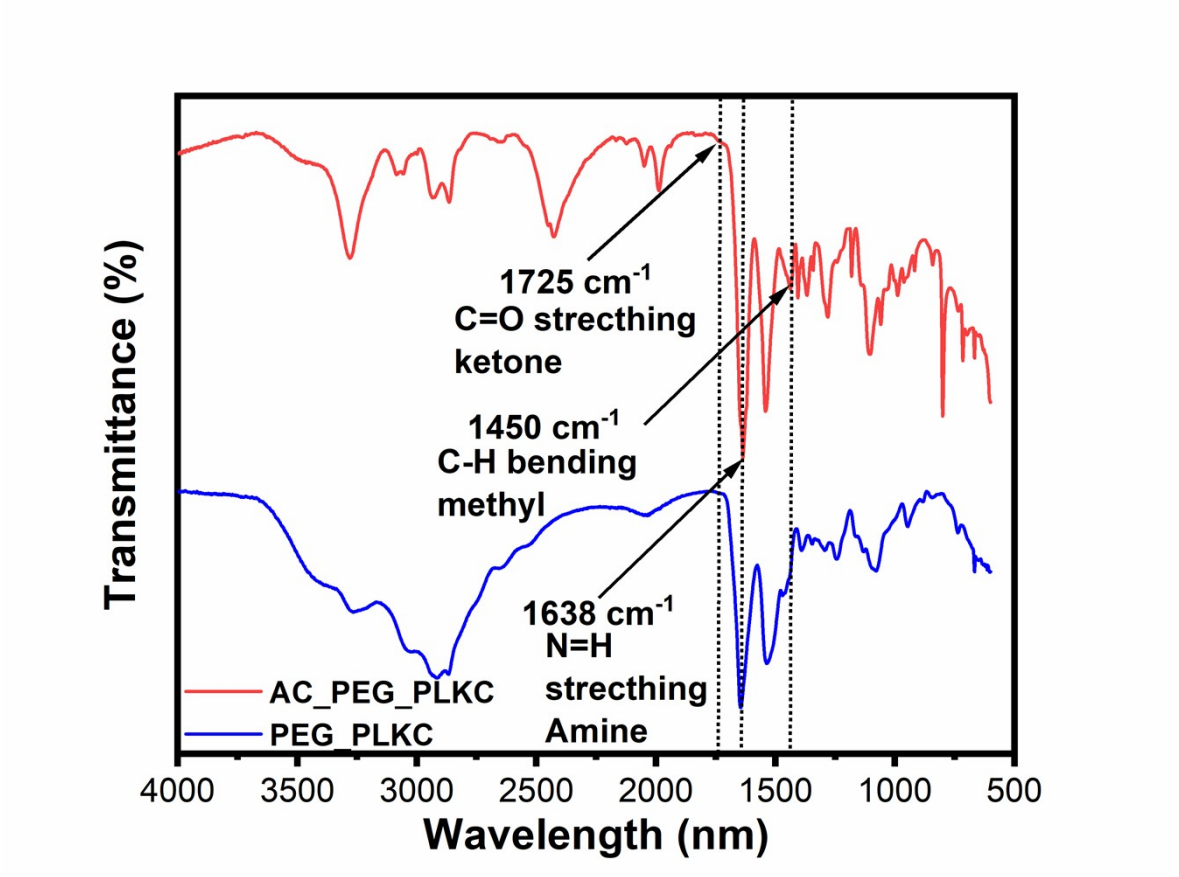


**Figure S3**: Comparative FTIR studies of the starting materials, PEG-block-poly(L-lysine) and the product, PEG-block-poly (acetylated L-lysine).

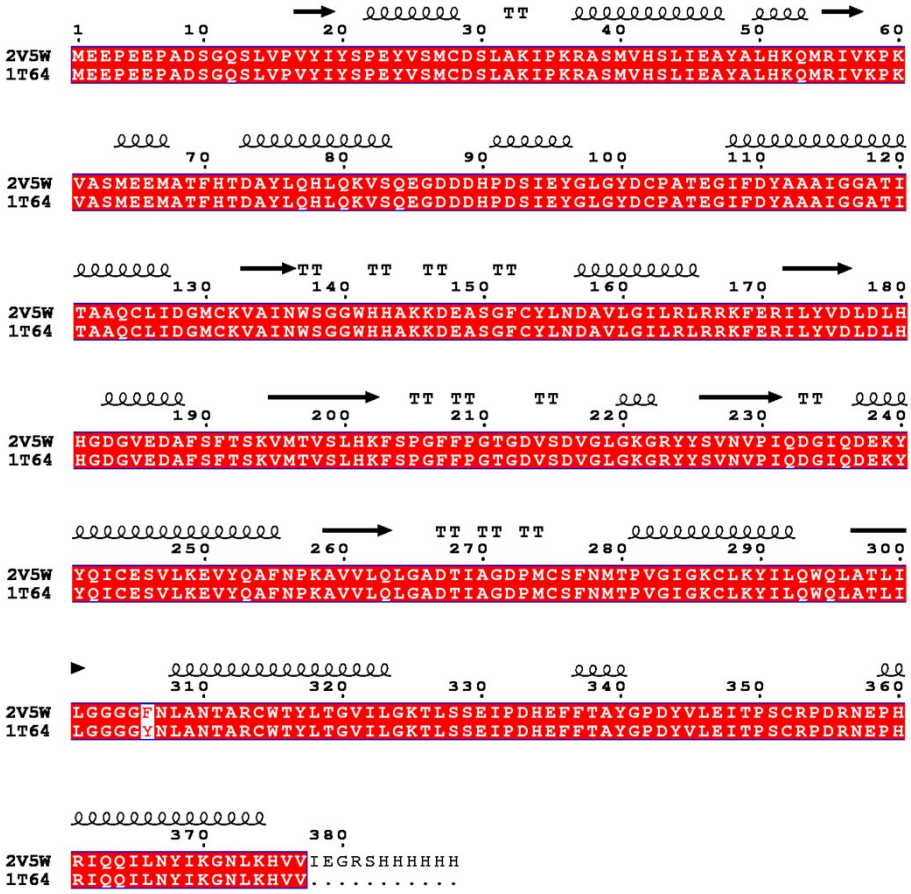


**Figure S4.** Sequence alignment between Tyr306Phe mutated (2V5W) and non-mutated (1T64) HDAC8.

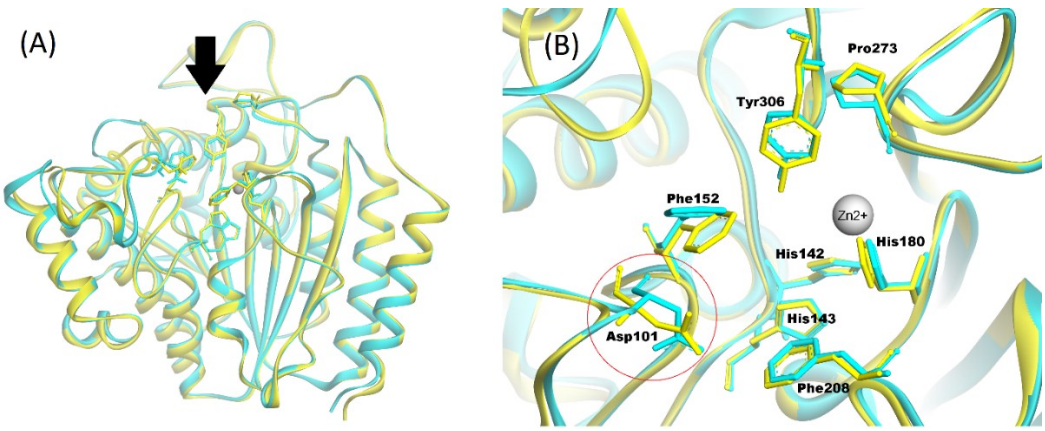


**Figure S5.** (A) Structural alignment of optimized Tyr$^{306}$-2V5W and non-mutated HDAC8 (1T64). (B) Visualization from the upper side (black arrow) revealed the movement of residues in the active site of two protein structures.