**Supplemental file 3:** **The schematic of the mechanism in the study**

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In the nucleus, histone and DNA form a DNA-histone complex, the change of the conformation of the complex regulates the transcription of the DNA. In normal condition, two kinds of protease, histone acetylases (HATs) and histone deacetylases (HDACs), keep the DNA-histone complex in equilibrium. The histone acetylation catalyzed by HATs can promote the dissociation of DNA and histone, so transcription factors can bind to DNA binding sites specifically, thus facilitating gene transcription. In general, the addition of acetyl groups to histones by HATs is correlated with an increase in gene expression, whereas removal of acetyl groups by HDACs is associated with transcriptional repression. Therefore, as a HDACs inhibitor, VPA can increase the level of histone acetylation, inhibit the activation of NFκB caused by ICH, decrease the expression of MMP9, up regulate the expression of tight junction protein, and protect the integrity of BBB.