Nucleosomes are the fundamental unit of chromatin. They control eukaryotic genome accessibility and can regulate expression, replication, and repair of the genome by organizing chromatin. Post-translational modification on nucleosomes affects chromatin dynamics and controls the unwrapping and assembly of nucleosomes. For example, methylation and acetylation of nucleosomes have been intensively studied as marks of chromatin status involving active or silenced transcription. To investigate how acetylation (H4K5/8/12/16) and methylation (H3K36me3) affect chromatin structure, we employ single molecule techniques, in particular AFM imaging and magnetic tweezer. AFM imaging can reveal the different conformational states of variant nucleosomes. By using magnetic tweezers force-spectroscopy [1], we can pull out the variant nucleosomes to complement the AFM imaging result. Those techniques help us understand the cellular mechanism of those different variants of chromatin.