During mammalian spermatogenesis, chromatin undergoes stage-specific structural reorganization. Th2a and Th2b are major testis-specific histone variants, and our recent studies suggest that they are involved in reprogramming. Here, the crystal structure of nucleosome core particles (NCPs) with mouse Th2a and Th2b variants will be presented. Intriguingly, NCPs consisting of either Th2a, Th2b or both variants have two significant changes. The L1-L1’ loop interaction between Th2a-Th2a’ is weakened and histone dimer-DNA contacts are reduced around ± 32 base pairs from the entry/exit sites of the nucleosome. Although Th2a/Th2b is a stable dimer, it alleviates the stability of NCPs compared to canonical H2a-H2b. However, NCP complexes containing these variants are sensitive to salt dissociation, which supports the reduction of histone dimer-DNA contacts in the structure. *In vivo* studies using domain swapping and point mutants of histone variants supported the above structural modifications, which are indeed important for induced pluripotent stem cell generation.

At the end, in contrast to the eukaryotic chromatin structure, archaeal chromatin structure and its unique DNA-packing mode will be discussed.