



**Figure 6. The Transition from a Euchromatic State to a Heterochromatic State Requires a Series of Changes in Histone Modification**

(a) Active genes are marked by H3K4me<sub>2</sub> and me<sub>3</sub>; if present, this mark must presumably be removed by LSD1 (not yet characterized in *Drosophila*). H3K9 is normally acetylated in euchromatin; this mark must be removed by a histone deacetylase, HDAC1. Phosphorylation of H3S10 can interfere with methylation of H3K9; dephosphorylation appears to involve a phosphatase targeted by interaction with the carboxyl terminus of the JIL1 kinase. These transitions set the stage for acquisition of the modifications associated with silencing, shown in b, including methylation of H3K9 by SU(VAR)3-9, binding of HP1, and subsequent methylation of H4K20 by SUV4-20, an enzyme recruited by HP1. Methylation of H3K27 by E(Z) may also occur.