**PRMT6-mediated H3R2me2a guides Aurora B to chromosome arms for proper chromosome segregation**

Chang-Young Jang

Sookmyung Women’s University

**Abstract**

The kinase Aurora B forms the chromosomal passenger complex (CPC) together with Borealin, INCENP, and Survivin to mediate chromosome condensation, the correction of erroneous spindle-kinetochore attachments, and cytokinesis. Phosphorylation of histone H3 Thr3 (H3T3ph) by Haspin kinase and of histone H2A Thr120 (H2AT120ph) by Bub1 concentrates the CPC at the centromere. However, how the CPC is recruited to chromosome arms upon mitotic entry is unknown. Here, we showed that asymmetric dimethylation at Arg2 on histone H3 (H3R2me2a) by protein arginine methyltransferase 6 (PRMT6) recruits the CPC to chromosome arms and facilitates histone H3S10 phosphorylation (H3S10ph) by Aurora B for chromosome condensation. Furthermore, *in vitro* assays showed that Aurora B preferentially binds to the H3 peptide containing H3R2me2a and phosphorylates H3S10. Our findings indicate that the long-awaited key histone mark for CPC recruitment onto mitotic chromosomes is H3R2me2a, which is indispensable for maintaining appropriate CPC levels in dynamic translocation throughout mitosis.