

Philip Yung

Division of Life Science,

The Hong Kong University of Science and Technology, HK

Email: 5primer3@gmail.com

Selected Publication

Yung PYK, Stuetzer A, Fischle W, Martinez AM, Cavalli G. (2015). Histone H3 serine 28 is essential for efficient polycomb-mediated gene repression in *Drosophila*. *Cell Reports* 11, 1437- 45.

Research Aims and Interests

Trimethylation at histone H3K27 is central to the polycomb repression system. Juxtaposed to H3K27 is a widely conserved phosphorylatable serine residue (H3S28) whose function is unclear. To assess the importance of H3S28, we generated a *Drosophila* H3 histone mutant with a serine-to-alanine mutation at position 28. H3S28A mutant cells lack H3S28ph on mitotic chromosomes but support normal mitosis. Strikingly, all methylation states of H3K27 drop in H3S28A cells, leading to Hox gene derepression and to homeotic transformations in adult tissues. These defects are not caused by active H3K27 demethylation nor by the loss of H3S28ph. Biochemical assays show that H3S28A nucleosomes are a suboptimal substrate for PRC2, suggesting that the unphosphorylated state of serine 28 is important for assisting in the function of polycomb complexes. Collectively, our data indicate that the conserved H3S28 residue in metazoans has a role in supporting PRC2 catalysis.