**Mini-symposium on Cancer Bioengineering**  
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**Title:** Epigenetic Reprogramming of Aging and Disease

**Abstract:**
Epigenetics has recently emerged as one of the most important mechanisms for the regulation of gene expression and cellular function. In addition, epigenetic changes induced by our lifestyle and the environment play crucial roles in human diseases as well as aging. For these reasons, therapeutic strategies aiming at the manipulation of the epigenome are been developed for the treatment of multiple diseases including cancer. I have recently demonstrated that epigenetic reprogramming by short-term expression of Oct4, Sox2, Klf4, and c-Myc (OSKM) also known as the Yamanaka factors can ameliorate hallmarks of aging in mouse and human cells. Interestingly, OSKM in vivo cyclic expression in a mouse model of premature ageing improves age-associated phenotypes in multiple organs and prolongs lifespan. Lastly, in vivo cellular reprogramming enhances the recovery of physiologically aged mice from metabolic disease and muscle injury. These observations highlight the importance of epigenetic regulation during mammalian aging and disease, and reinforce the potential of epigenetic reprogramming as a novel strategy for improving health and longevity.