

Recent advances in cell reprogramming showed that OSKM induction is able to improve cell physiology in vitro and in vivo. Here, we show that a single short reprogramming induction is sufficient to prevent musculoskeletal functions deterioration of mice, when applied in early life. In addition, in old age, treated mice have improved tissue structures in kidney, spleen, skin, and lung, with an increased lifespan of 15% associated with organ-specific differential age-related DNA methylation signatures rejuvenated by the treatment. Altogether, our results indicate that a single short reprogramming early in life might initiate and propagate an epigenetically related mechanism to promote a healthy lifespan.