

Muscle reprogramming for regenerative medicine

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Muscle loss and atrophy caused by traumatic injury, surgery, and aging cause functional impairment and disability. Transplantation of myogenic cells and stem cells has been proposed as a therapeutic approach for functional muscle regeneration but securing reliable cell sources is still challenging. Direct reprogramming can provide reliable cell sources for muscle tissue engineering. However, functional maturation of reprogrammed cells needs to be improved. In a series of our study, we have developed biomedical platforms to enhance direct reprogramming to myogenic cells and improve maturity and functionality of reprogrammed muscle. Our engineering elements including biomimetic scaffolds, cell patterning, decellularized matrix, and electrical cues potentiate muscle reprogramming for regenerative medicine. Acknowledgment: This work was supported by the Institute for Basic Science (IBS-R026-D1).