

Targeting twist to promote stem cell based cartilage repair

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Abstract

Rapid induction of Mesenchymal stem cells (MSCs) chondrogenic differentiation during therapeutic transplantation remains extremely challenging. Here the author undertook a study to determine if twist1 inhibition by shRNA could be utilized to accelerate human Placenta-derived MSC-mediated cartilage repair in a mouse cartilage defect model. Our data clearly indicated that silencing twist1 significantly enhanced chondrogenesis by showing increased alcian blue staining enhanced Col-II expression when compared to control wild type PMSCs. Importantly, the *in vivo* transplantation of twist1 deficient PMSCs into knee joint cartilage defects had a significantly enhanced cartilage formation by showing stronger alcian blue and Col-II staining in cartilage defect area. Finally, the PCR data further confirmed an increased expression of chondrogenic markers Sox9, Col-II and aggrecan in knee joint tissue with transplantation of twist1 deficient PMSCs. Collectively; these findings demonstrate that PMSCs are a favourable cell source for cartilage repair and silencing transcript factor twist1 could accelerate PMSC differentiation into chondrocyte under the cartilage micro-environment *in vivo*.

Biography

Yufeng Dong, MD and PhD, a tenured associate professor, is the Director of Translational Research in the Department of Orthopaedic Surgery. He is also the Co-Director of Centre for tissue engineering and regenerative medicine funded by LSU Health Shreveport and Louisiana Tech University. He has more than 30 publications and received a significant funding from the NIH, Orthopaedic Research and Education foundation, Airlift Research Foundation and Lonza Research Foundation to study the critical effects of stem cells on cartilage and bone regeneration.



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