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Decellularized stem cell matrix: A novel cell expansion system for cartilage tissue engineering

Cell-based therapy is a promising biological approach for the treatment of cartilage defects. Due to the small size of autologous cartilage samples available for cell transplantation in patients, chondrocytes need to be expanded to yield sufficient cell number for cartilage repair. However, either chondrocytes or adult stem cells tend to become replicatively senescent once they are expanded on conventional plastic flasks. Many studies demonstrate that the loss of cell properties is concomitant with the decreased cell proliferation capacity. This is a significant challenge for cartilage tissue engineering and regeneration. Despite much progress having been made in cell expansion, there are still concerns over expanded cell size and quality for cell transplantation application. Recently, *in vivo* investigations in stem cell niches have suggested the importance of developing an *in vitro* stem cell microenvironment for cell expansion and tissue-specific differentiation. Our and other investigators' work indicates that a decellularized stem cell matrix may provide such an expansion system to yield large-quantity and high-quality cells for cartilage tissue engineering and regeneration. Further investigations of the underlying mechanism and *in vivo* regeneration capacity will allow this approach to be used in clinics in the near future.

Biography

Dr. Ming Pei completed his Ph.D. from Beijing University and conducted postdoctoral studies at Harvard-MIT Division of Health Sciences and Technology (HST). Currently he is an Associate Professor and the Director of Stem Cell and Tissue Engineering Laboratory at the Department of Orthopedics at West Virginia University. He also serves as Adjunct Faculty in Exercise Physiology and Mechanical and Aerospace Engineering at WVU. He has published more than 45 papers in reputed journals and is serving as an Editorial Board Member for seven journals.

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