Current Trend and Future Perspectives of Regenerative Medicine

James J. Yoo
Wake Forest Institute for Regenerative Medicine
Winston-Salem, North Carolina, U.S.A.

Engineering three-dimensional (3D) implantable tissue constructs is a promising strategy for replacing damaged or diseased tissues and organs with functional replacements. However, the efficient vascularization of new 3D organs is a major scientific and technical challenge since large tissue constructs or organs require a constant blood supply to survive in vivo. Current approaches to solving this problem generally fall into the following three major categories: (a) cell-based, (b) angiogenic factor-based, and (c) scaffold-based. In this presentation, we summarize state-of-the-art technologies that are used to develop complex, stable, and functional vasculature for engineered 3D tissue constructs and organs; additionally, we have suggested directions for future research.