

Applies the principles of engineering and life sciences to develop a fully functional human organ in vitro to cope up with the problem of organ scarcity

Atsala Upadhyay

Meerut Institute of Engineering and Technology, India

Abstract

Tissue Engineering (TE) is an interdisciplinary field that applies the principles of engineering and life sciences to develop a fully functional human organ in vitro to cope up with the problem of organ scarcity. TE uses living cells (stem cells) and their extracellular components with polymer based biomaterial scaffolds to develop biological tissues for human body repair, such as organ transplants. Stem cells, such as human induced pluripotent stem cells, have driven a paradigm shift in tissue regeneration and the modelling of human disease, and represent an unlimited cell source for tissue regeneration and the study of human disease. The ability to reprogram patient-specific cells holds the promise of an enhanced understanding of disease mechanisms and phenotypic variability. Scaffold serves numerous functions critical for the success of tissue regeneration. It allows cells to attach, grow, proliferate, migrate and differentiate. Extensive research is going on in the areas of Cornea TE, Bone TE, Dental TC, Skin TE, Cardiovascular TE, Cartilage TE, Liver TE and Urinary bladder TE. Cell sheet engineering, organ printing technology and use of bioreactors provide new insights for TE. On the whole, TE appears to be the new frontier of medicine for its impact on regenerative and reconstructive procedures in humans. Each phase in TE must be understood in an integrated manner from the polymer material properties, to the micro- and macro-architecture of scaffold, to the cell, to the tissue-engineered transplant and finally to the host tissue.

Received: March 07, 2022 ; **Accepted:** March 14, 2022 ; **Published:** March 25, 2022

Biography

Atsala Upadhyay perusing 2nd year B.Tech. in biotechnology from Meerut institute of engineering and

technology, Meerut, U.P. affiliated to Dr. A. P. J. Abdul Kalam Technical University, Lucknow.