EDITORIAL

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Principals and applications of regenerative medicine with reference to experimental studies in Egypt

Manal H.Moussa[1] ,Sahar M.Mahdy[1] Eslam M.Sofy[2] ,Assem M.Mohamed [2] , Abdelrahman M.Hassan[2] ,Ahmed M.Elsonbaty [2], Abdelrahman A.Ahmed[2]

1 Histology Department, Armed Forces College of Medicine , Cairo, Egypt.
2Undergraduate student, Armed Forces College of Medicine, Cairo, Egypt

Abstract: According to the health resources and services administration (HRSA), about 20 persons die every day due to waiting for the transplant. About 113,000 persons were reported to be waiting for the transplant in July 2019.
Aim: in a trial to solve this health problem, we will talk about the new fabrication technology in tissue engineering and the concomitant addition of cells and growth factors that is currently used in regenerative medicine. We will also talk about the successful applications done to treat critical defects.

The 3 pillars for regenerative medicine are the use of biomaterial, cells (stem cells) and biomolecules (growth factors). The biomaterial could be natural or synthetic. The rational is to try to mimic the extracellular matrix. In addition, they must be biocompatible, biodegradable and of mechanical strength. The type of stem cells to be used is critical. We need to control the characters of the stem cells to reduce the probability of adverse effects. The growth factors to be added will play a critical role in directing the stem cell differentiation. The three-dimensional (3D) printing technology is a new technology to regenerate an artificial organ. In this review, we will focus on the results of the experiments done to treat critical bone defects, skin defects and urinary bladder defects in Egypt.
Regenerative Medicine Applications in Organ Transplantation illustrates exactly how these two fields are coming together and can benefit one another. It discusses technologies being developed, methods being implemented, and which of these are the most promising. The text encompasses tissue engineering, biomaterial sciences, stem cell biology, and developmental biology, all from a transplant perspective. Organ systems considered include liver, renal, intestinal, pancreatic, and more. Leaders from both fields have contributed chapters, clearly illustrating that regenerative medicine and solid organ transplantation speak the same language and that both aim for similar medical outcomes. The overall theme of the book is to provide insight into the synergy between organ transplantation and regenerative medicine.

Recent groundbreaking achievements in regenerative medicine have received unprecedented coverage by the media, fueling interest and enthusiasm in transplant clinicians and researchers. Regenerative medicine is changing the premise of solid organ transplantation, requiring transplantation investigators to become familiar with regenerative medicine investigations that can be extremely relevant to their work. Similarly, regenerative medicine investigators need to be aware of the needs of the transplant field to bring these two fields together for greater results. Exploring innovative solutions to improve the healthcare of the aging and diseased population continues to be a global challenge. Among a number of strategies toward this goal, tissue engineering and regenerative medicine has gradually evolved into a promising approach to meet future needs of patients. TERM has recently received increasing attention in Asia, as evidenced by the markedly increased number of researchers, publications, clinical trials, and translational products. This review aims to give a brief overview of TERM development in Asia over the last decade by highlighting some of the important advances in this field and featuring major achievements of representative research groups. The development of novel biomaterials and enabling technologies, identification of new cell sources, and applications of TERM in various tissues are briefly introduced. Finally, the achievement of TERM in Asia, including important publications, representative discoveries, clinical trials, and examples of commercial products will be introduced. Discussion on current limitations and future directions in this hot topic will also be provided. Fully repairing or regenerating damaged tissues or organs and restoring their functions have been a dream of human beings. The advent of tissue engineering and regenerative medicine appears to make it possible. Tissue engineering combines cells, scaffolds, and growth factors to regenerate tissues or replace damaged or diseased tissues, while regenerative medicine combines tissue engineering with other strategies, including cell-based therapy, gene therapy, and immunomodulation, to induce in vivo tissue/organ regeneration is a multidisciplinary science and combines basic sciences such as materials science, biomechanics, cell biology, and medical sciences to realize functional tissue/organ repair or reconstruction. With the aging of world population trend intensifying, there is an increasing demand of organ replacements. Regenerative medicine holds the potential to meet the future needs of patient.