Drug Designing: Open Access

OPEN ACCESS Freely available online

Editorial

Role of Biomaterial in Tissue Engineering

Singher Juliano*

Department of Bioengineering, Harvard Medical School, Harvard, USA

INTRODUCTION

Biomaterials have great importance and a vital role in the engineering of damaged tissues that have lost their functionality as a part of their system. They provide a temporary frame work of the tissue structure lining to help in new tissue growth and organization and also give bioactive signals for example cell-adhesion peptides and growth factors) needed for the recovery of tissue linked gene expression. A wide variety of biomaterials can be differentiated into 3 type's naturally derived materials that may include collagen and alginate, a cellular tissue matrices that may include bladder sub mucosa and small-intestinal sub mucosa, and synthetic polymers that may include polyglycolic acid, polylactic acid, and poly lactic-co-glycolic [1].

Tissue engineering has combined the advantages and applications of biological life sciences with the bioengineering of the cells and tissue. For this we need to illuminate the comprehension of the structural and functional relationship normal living as well as dead cells in the tissues [2].

In the advancement of tissue engineering we have come to know about various combined techniques with the tissue engineering, for example Stem cell and tissue engineering that help in regeneration of the damage tissues with the transplantation of stem cells. But the limitation of this high developed technique is these cells after being transplanted lose their viability and ability to regenerates in the damaged tissue the main reason behind this drawback is lack of proper biological environment for the stem cells to differentiate to normal living cells that help in recovering the damaged tissue [3].

As we know that cells are separated from each other by matrix called Extra Cellular Matrix (ECM) which help in cell viability and interactions among cells. It also helps in cell division, and cell differentiation. This ECM also regulates the tissue structure. So in order to create an artificial environment of the ECM we can use Biomaterials in tissue engineering [4].

Biomaterials help in the localization and transport of cells to targeted sites in the body, that provides 3-D space for the generation of new tissues with proper structure, and confide for the growth of new tissues with suitable function. In some cases there involves only injection of the stem cell suspensions without the usage of matrices of biomaterials, however the technique was found to be not successful because it lacks the control cell localisation the transplanted or injected stem cell suspensions. Moreover, most of the mammalian cell types are depend on the cell viability and will lose their properties to survive if there are not provided with the proper and appropriate adhesion substrates. Biomaterials in this case help in supplying the adherence substrate thereby reaching the targeted damaged tissues in the body [5].

CONCLUSION

The development of new methods and materials by mixing the techniques, advantages and applications of the synthetic materials and naturally derived materials (hybrid biomaterials) has become the emerging idea in the field of tissue engineering. These hybrid biomaterials have the properties of naturally derived material as well as favourable advantages of synthetic materials. But till now the role of biomaterials in inducing the cell and tissue responses is still unclear.

REFERENCES

1. Langer R, Vacanti JP. Tissue engineering. Science. 1993;260(5110):920-926.
2. Peppas NA, Langer R. New challenges in biomaterials. Science. 1994;263(5154):1715-1720.
3. Buck CA, Horwitz AF. Cell surface receptors for extracellular matrix molecules. Ann rev cell biol. 1987;3(1):179-205.
4. Tabata Y. Biomaterial technology for tissue engineering applications. J Roy Soci inte. 2009;6:S311-24.
5. Chen FM, Liu X. Advancing biomaterials of human origin for tissue engineering. Progr poly sci. 2016;53:86-168.

Correspondence to: Singher Juliano. Department of Bioengineering, Harvard Medical School, Harvard, USA, Email: singhjuliano@1220.edu

Received: December 04, 2020**; Accepted:** December 18, 2020**; Published:** December 28, 2020

Citation: Juliano S (2020) Role of Biomaterial in Tissue Engineering. Drug Des. S5.e003.