International Research Journal of Biotechnology Vol. 14(2) pp. 1-3, April, 2023
Available online http://www.interesjournals.org/IRJOB

Mini Review

Ancient Origins of Precision Medicine and Future Medical Approaches

Anamika Mishra*

Department of Biotechnology, University of India, India

*Corresponding Author's E-mail: mishra45@gmail.com

Received: 25-Mar-2023, Manuscript No. IRJPS-23-92895; **Editor assigned:** 27-Mar-2023, PreQC No. IRJPS-23-92895(PQ); **Reviewed:** 10-Apr-2023, QC No. IRJPS-23-92895; **Revised:** 14-Apr-2023, Manuscript No. IRJPS-23-92895(R); **Published:** 21-Apr-2023, DOI: 10.14303/2141-5153.2023.41

Abstract

Based on the principles of stem cell technology and tissue engineering, precision medicine is a distinct and significant advancement in medical treatment that aims to replace or regenerate human tissues and organs and restore their functions. This strategy is beginning to become a useful treatment option for acute injuries, chronic diseases, and congenital anomalies after years of basic research. Despite this, it is a relatively obscure area of study. The objective of this review is to provide an overview of the current state of precision medicine in terms of current practices, prevailing approaches, and pressing issues to be addressed in the future. For personal research projects and more in-depth studies, this review is a good place to start.

Keywords: Stem cell technology, Precision medicine, Human tissue, Chronic diseases, Congenital anomalies

INTRODUCTION

Precision medication suggests the substitution or recovery of human cells, tissue or organs, to re-establish or lay out typical capability **(Dalakouras A, et al., 2015).**

Most people think that William Heseltine came up with the term "precision medicine" at a conference on Lake Como in 1999 to describe an emerging field that combines knowledge from a variety of fields: biomechanics, prosthetics, nanotechnology, tissue engineering, cell transplantation, stem cell biology, and biochemistry. In a 1992 paper by Leland Kaiser, who listed the technologies that would have an effect on the future of hospitals, this term was first discovered **(Meister G, et al., 2004).**

RM is regarded as a novel area of medical research, whereas the concept of fabricating artificial organs is not particularly novel. Alexis Carrell, who won the Nobel Prize for his work on vascular anastomosis, and Charles Lindbergh, who became the first person to fly solo across the Atlantic, wrote the book "The culture of new organs" in 1938. He was wondering why his sister-in-law's fatal heart condition couldn't be fixed surgically. The artificial heart was developed as a result of their work **(Joga MR, et al., 2016).**

In nature, parts of the body can regenerate quite frequently; a salamander can quickly regenerate an amputated limb. This ability is also present in humans, but over time they lose it: Until the age of 11, a severed fingertip can regenerate **(Baum JA et al., 2014).** The human recovery potential was notable additionally in antiquated times, as shown by the legend of Prometheus: his liver was eaten by a falcon during the day and it totally recovered itself short-term.

Medicine has achieved many successes over the centuries: sterilization, anesthesia, antibiotic treatment, etc. However, there are still a lot of diseases that can't be fixed by keeping the organs that are affected, so they need to be removed, fixed with autologous tissues, or even replaced with allografts **(Haiyong H 2019).** In conventional surgery, this is referred to as the three R's paradigm, which consists of three solutions, each of which addresses distinct issues. Long-term total parenteral nutrition is imposed on a patient when a surgeon resects an extensive portion of the small bowel, resulting in a malabsorption syndrome known as short bowel syndrome. This puts the patient's life in danger.

Using a portion of the small bowel, augmentation cystoplasty may be necessary for individuals with high-pressure or poorly compliant bladders. Since gastrointestinal tissues adsorb solutes instead of discharge pee, the fixed bladder

is many times confounded by expanded mucous creation, diseases, metabolic unsettling influences, urolithiasis, hole and even malignant growth **(Heigwer F et al., 2018).**

In terms of organ transplants, the kidney was the first organ to be transplanted into a human in 1954, but it was done between identical twins to avoid rejection. Later, cell transplantation was also made possible: The bone marrow of an immunodeficient patient was given to him. Due to the adverse immunological responses, transplants were initially relegated to research. However, the introduction of cyclosporine in the 1980s made transplants life-saving treatments because the risk of rejection could be significantly reduced. One of the two major issues with transplants today is lifelong immunosuppression, which has a lot of side effects **(Ansari A et al., 2017).** The absence of donors to meet the ever-increasing demand for organs is the second issue. End-stage diseased organs that have been damaged by age-related diseases will require more transplants as the population ages.

All of these issues have an impact on the economy and society: In the United States, there were 41 workers for every retiree in 1941; today, there are only three workers for every retiree. As a result, the prevalent chronic diseases that render people disabled only affect a small portion of citizens who are working age. As a result, the medical field is confronted with pressing issues that necessitate the development of new medical treatments **(Gupta K et al., 2014).** The regeneration of damaged tissues, also known as "the fourth R," has the potential to revolutionize modern medicine by providing a means of treating diseases rather than just their symptoms.

DISCUSSION

Humans have a complex multicellular framework that includes a variety of cell types that are specialized in specific functions. In any case, all phones dive from one remarkable cell, called zygote. During development, cells gradually become more and more specific in their tasks and lose the ability to differentiate into other cells. "Cell potency" refers to a cell's capacity to differentiate into other cell types. In cell therapy, new, healthy cells are injected into diseased tissues. It can rely on cells that have already differentiated or undifferentiated stem cells, which can differentiate in response to specific conditions.

The goal of adult stem cells, which have been isolated from nearly every adult human body tissue, is to restore the original function of damaged tissue. Due to their extensive research, the bone marrow-derived mesenchymal stem cells play a significant role among these cells. They have been demonstrated to be able to differentiate into a variety of cell types through a variety of culture protocols, making them useful for the treatment of bone, cartilage, nervous, muscle, cardiovascular, blood, and gastrointestinal diseases **(Younis A et al., 2014).**

RM opened up new avenues for treating patients with physically impaired tissues and diseases that are difficult to treat. Many scientists and clinicians are still unfamiliar with RM, despite its numerous successes. Tissue engineering and precision medicine have the potential to solve the unsolvable issues with current medical treatments, posing a significant limitation. It is necessary to obtain significant financial investments from a variety of sources, including governments and industries that are focused on research and medical innovation, in order to regularly use RM in the clinical setting **(Guo Q et al., 2016).** To promote the stability of collaborations worldwide and to accelerate the development of novel therapies, there is a significant need for long-term vision and support for RM.

CONCLUSION

Notwithstanding the monetary and specialized concerns, process improvement is a critical obstacle to make do with and it incorporates protected innovation, fabricating, and strategic worries. Tissue engineering and cell therapy have the potential to transform patient care. However, in order for this idea to become a reality, it must be developed through process development into widely available commercial products.

Since RM is a cross-sectional area of examination, a multidisciplinary group, including specialists, scholars, bioengineers, physicists, and specialists, is expected to start and dominate the key advances engaged with cell treatment and tissue designing. Training in cell culture, stem cell technology, tissue engineering, and experimental surgery is required as a result of this. The most important aspect of this revolution is converting the numerous recent scientific discoveries into novel and effective treatments: from the bench to the bed.

ACKNOWLEDGEMENT

None

CONFLICT OF INTEREST

None

REFERENCES

1. Dalakouras A, Dadami E, Wassenegger M (2015). Engineering viroid resistance. Viruses. 7: 634-646.
2. Meister G, Tuschl T (2004). Mechanisms of gene silencing by double-stranded RNA. Nature. 431: 343–349.
3. Joga MR, Zotti MJ, Smagghe G, Christiaens O (2016). RNAi Efficiency Systemic Properties, and Novel Delivery Methods for Pest Insect Control: What We Know So Far. Front Physiol. 1–14.
4. Baum JA, Roberts JK (2014). Progress towards RNAi-mediated insect pest management. Advances in insect physiology. 47: 249–295.
5. Haiyong H (2019). RNA Interference to Knock Down Gene Expression. HHS Public Access. 1–9.

6. Heigwer F, Port F, Boutros M (2018). RNA Interference (RNAi) Screening in Drosophila. Genetics. 208: 853-874.

7. Ansari A, Wang C, Wang J, Wang F, Liu P, et al. (2017). Engineered Dwarf Male-Sterile Rice: A Promising Genetic Tool for Facilitating Recurrent Selection in Rice. Front Plant Sci. 8: 2132.

8. Gupta K, Sengupta A, Saha J, Gupta B (2014). Gene Technology the Attributes of RNA Interference in Relation to Plant Abiotic Stress Tolerance 3: 1–4.

9. Younis A, Siddique MI, Kim C, Lim K (2014). RNA Interference (RNAi) Induced Gene Silencing: A Promising Approach of Hi-Tech Plant Breeding. Int J Biol Sci. 10: 1150–1158.

10. Guo Q, Liu Q, Smith NA, Liang G, Wang MB (2016). RNA Silencing in Plants: Mechanisms, Technologies and Applications in Horticultural Crops, Current Genomics. Curr Genomics. 17: 476-489.