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Future prospects of Nanomedicine: An Overview De

Abstract

Nanotechnology involves manipulation of matter on "nanoscale" from 0.1 nm to 100 nm and it is found to be very promising technology in today's era. Due to its extremely small size there are variety of ways to design materials at nanoscale range so as to take advantage of their enhanced properties such as higher strength, lighter weight and more accuracy. Nanoscience and nanotechnology involves the ability to see and control individual atoms and molecules which makes it more precise especially in the medical field where it can be used in Early detection, treatment, and most importantly for the targeted drug delivery which helps in prevention and treatment of many fatal diseases like Cancer, Alzheimer, Parkinson's anti-inflammatory diseases etc.

Keywords: Nanoparticles; Nanomedicines; Nanodevices; Global Networking

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INTRODUCTION

Nanotechnology and Nanomaterials

Nanotechnology involves the design of structures measuring 1 nm to 100 nm in diameter. Nanomaterials are being developed as drug-delivery vehicles, contrast agents, and diagnostic devices and some are now being studied in clinical trials [1]. Nanomedicines are now days gaining more popularity because of its targeted drug delivery which causes no harm to other neighboring cells which is commonly seen in the traditional method of chemotherapy and radiotherapy where it harms the non-targeted cells deteriorating the other cells of the body causing weak immune system and making the patient immunocompromised. Nanomedicines are designed in such a way that they cross the body barriers and specifically reach to the target tumor cell thereby releasing the loaded medicines on the site of the disease. Nanomedicine is in infancy stage of development but it has a lot of scope of improvement in near future because of its reliabity, accuracy and use of minimal amount of sample. Nanoparticles of several metals are used for making nanomedicine such as Gold nanoparticles, silver nanoparticles etc. NP properties (for example size, geometry, surface features, elasticity, stiffness, porosity, composition and targeting ligand) can influence these biological processes, thus determining the EPR effect and therapeutic outcomes [2]. The market of Nanomedicine is rapidly growing it is rather new but a lot of scientific research is to be invested in this field to make it more cost effective. Nanomedicines can be of great use but we have to make such Nano devices and nanomedicines that are very accurate and working. The main aspect to be considered in nanomedicines and nanodevices is their size and property of dispersion of nanoparticles. Global

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nanomedicine market is mainly driven by its applications in medical field, targeted disease and region/geography. Based on the findings, USA is leading in number of Patent applications in the field of nanobased drug delivery followed by Europe and Asia. North America dominated the industry in 2016, resulting in 42% of total revenue. Applications segment includes drug delivery (carrier), drugs, biomaterials, in-vitro diagnostic and in-vivo imaging. Global nanomedicine divided on the basis of targeted diseases or disorders in following segment: neurology, cardiovascular, oncology, anti-infective and others. Cell therapy is the fastest growing area of regenerative medicine and also the largest. Globally, the stem cell therapy market is expected to be worth U.S. \$40 billion by 2020 and U.S. \$180 billion by 2030. Major contributors in the Global Nanomedicine market are Merck and Co., Hoffman-a Roche Ltd., Abbott Laboratories, GlaxoSmithKline plc. Gilead Sciences Inc., Novartis AG, Sanofi, Johnson & Johnsons, etc. [3]. As per WHO fact sheet, Cancer is found to be one of the major causes of mortality and morbidity worldwide. Thus, demand of nanomedicine in order to prevent and treat the deadly disease boosts up the market. Oncology is the major segment of nanomedicine market which approximately comprises of 35% of total market share. According to nanobiotix (a nanomedicine company) in 2015, around 230 nanomedicine products were identified, which are either marked or are in the trial phase. Moreover, as per the company, there 49 nanomedicine products in the market, whereas 122 products are in the clinical pipeline either in phase 2 or phase 3 trials. European countries are also entering the market of Nanomedicine as there are 1700 Institutions and 15 platforms like European Technology

Platform for Nanomedicine (ETPN), ESNAM (European Society for Nanomedicine Part of the international Society of Nanomedicine (Europe, USA, Canada, Republic of Korea, South Africa, India, China, Japan, Australia), European Characterization Center for ETPN, European Foundation for Clinical Nanomedicine (CLINAM) Research, Dissemination, Global Networking, which are working in the development of nanomedicine. There are 620 Nano-drug projects in the European pipeline; among them some are still in the Research phase, some in the Preclinical trials 1, 2 and 3. And few of them are approved and are being marketed. The future of Nanomedicine lies in Asia-Pacific region (China, Japan and India) where the market is growing at very fast rate due to increase in the urgency of healthcare and because of the low economy the workforce is cheaper comparatively to other countries which attract the overseas companies to invest into it. Following the lead United States of America has the greatest number of startups worldwide followed by Europe. Australia and New Zealand are also joining the race and it is will get a bigger market in near future and other countries expect the above are depended on others market or rather showing slow rate of development.

Conclusion

It's costly at the moment because a lot of technological work is needed to be done so that the cost of production can be bought down. There is Safety issues associated with naonomedicine like Lack of standard protocols, Physicochemical characterization has not been standardized, New structure-activity relationships continue to emerge & require adaptation to disease process, Due to their extremely small size there is a risk of retention of nanoparticles in the body parts like lungs, kidneys. It is believed that there is lot of areas unexplored in this field because of its newness but researchers are investigating to get the best out of it. With the advancement in technology day by day it is believed that there is a lot of scope of Nanomedicine in near future.

References

- 1 Kim BY, Rutka JT, Chan WC (2010) Nanomedicine. N Engl J Med 16:363(25):2423-2443
- 2 Shi J, Kantoff PW, Wooster R, Farokhzad OC (2017) Cancer

Nanomedicine: progress, challenges and opportunities. Nat Rev Cancer 17(1):20 $\,$

3 Fymat AL (2019) Global Market Analysis on Nanomedicine and Drug Delivery System. Am J Adv Drug Del 7(3):1-2.