IOSR Journal Of Pharmacy And Biological Sciences (IOSR-JPBS)
e-ISSN:2278-3008, p-ISSN:2319-7676. Volume 17, Issue 6 Ser. IV (Nov. – Dec. 2022), PP 43-44
www.Iosrjournals.Org

Quality Life with Nanomedicine

Dr Meeta Rani[1]
[1](Department of Physics, Mahila Vidyalaya Degree College, University of Lucknow, India)

Abstract: *This review paper presents a view of the past, present and future of nanomedicine which affects the quality of life as the novel properties of nanomaterials would play an important role in determining human health in future. Further the size reduction to nanometer range would play an important role in all aspects as everyday life will get affected and would require changes in routine medical practices.*
Key Words*: Nanotechnology, Nanomedicine.*

Date of Submission: 12-12-2022 Date of Acceptance: 28-12-2022

I. Introduction

In this review paper a broad array of present and research developments are generally lumped together as “nanotechnology”. A common feature is only that they are concerned with large and small things where at least some relevant measures are in the nanometer range and thus in the size-range of DNA-molecules or viruses. The demand of the day is that nanotechnological research should be restricted to the scientific investigation and a further technical exploitation of novel properties needs to be done. A ton of gold has the same chemical properties as a milligram, but a gold nanoparticle shows interesting and surprisingly new behaviours. Nanomedicine is a well-defined application of nanotechnology in the areas of healthcare and disease diagnosis and treatment. Artificial bone implants get improved by using nanotechnologically improved materials. Nanostructured surfaces can serve as suitable support structures for controlled tissue-growth. Of course, all kinds of medical devices profit from miniaturisation of electronic components as they move beyond micro to nano. This affects diagnostic tools, pace-makers, “camera in a pill” etc. Nanoparticulate pharmaceutical agents can penetrate cells more effectively as well as are able to cross the barriers in human body. On injecting nanoparticles into tumours, these are activated electromagnetically from outside the body which stimulates their action and particles then destroy the tumour cells. Antibacterial surfaces incorporating nanophotocatalytic or nanobiocidal particles greatly reduce the risk of infection in doctors’ offices and public buildings. Portable testing kits allow and ease self-monitoring and speedy diagnosis. New nanosized agents and visualisation tools provide a closer look at cellular processes. Nanosized steroids can be introduced into the body’s own red blood cells; as the cells die their natural deaths, the steroids are released to the body in very small doses, thus minimising the side-effects of many steroid treatments. The above examples and many more of ongoing developments have been found in various reports on the prospects and promises of nanomedicine. But through these examples are nothing to frown at, nanomedicine has been conceived as a far more ambitious enterprise: “Nanomedicine comes into being where a molecular understanding of cellular processes is strategically combined with capabilities to produce nanoscale medicinal materials in a suitably controlled manner.” With these ambitions comes the formidable challenge to assess more visionary programmes for their feasibility and also for the proper balancing of public investment and societal need, and their likely futuristic benefits.

II. A Brief History of Nanomedicine

Nanomedicine is an important offshoot of nanotechnology from the very beginning. Ever since nanotechnology has begun as a visionary enterprise, nanomedicine started by applying mainly nanomechanical concepts to the body. In his 1999 book on Nanomedicine, Robert Freitas [1] assembled an impressive array of ingenious ideas that derive from ongoing developments and inevitably lead to extravagant speculations. Freitas’s goals about nanomedicine of the short-term with the long-term and even with technical impossibilities remains characteristic even of the far more restrained technical papers of today. The cancer nanotechnology initiative in the United States revolves around the goal of “eliminating suffering and death from cancer”. The European Technology platform on Nanomedicine speaks of a “revolution in molecular imaging in the foreseeable future, leading to the detection of a single molecule or a single cell in a complex biological environment”. This statement expresses the fact that the problems of detecting molecules and cells are magnitudes apart: Cells are at least thousand times larger than molecules and it is certainly much easier to imagine a contrast agent or marker attached to or inside a cell. In the same report, the speculative spirit of Eric Drexler and Robert Freitas [3] informs a vision of cell-monitoring and repair: the detection of disease will happen as early as possible and "ultimately this will occur at the level of single cell, combined with monitoring the effectiveness of therapy". Nanomedicine is based on molecular level knowledge of the human body and it involves molecular tools for the diagnosis of disease and further for its treatment. Medical nanotechnology encompasses all the ways in which nanotechnology affects health care, from the miniaturisation of devices and the integration of information and communication technologies in diagnostic tools and health monitoring-including a radical transformation of the present day hospital with its traditional doctor-patient relationships.

III. Findings and Conclusion

Nanomedicine, in other words, is disease-centered, trying to do better and on a molecular level what physiology, pathology, and the various specialised medical sciences have been doing so far. Because it is disease-centered, nanomedicine leaves to medical nanotechnologies the more general and perhaps more profound transformations of health care: these concern public health monitoring, the integration of medical practices into routine of work and leisure, the redefinition of the data of the physiological body, and the reorganisation of its therapeutic context with its medical experts, insurance companies, state interests, and health care institutions. Another potential limitation of the narrowly defined nanomedical focus is brought to light by the European Technology platform which explicitly addresses an increasingly sedentary ageing population and its medical problems. Through the lens of disease-centered nanomedicine, this translates to the treatment of painfully arthritic joints. In a wider perspective the health of joints involves questions of mobility, nutrition and an integrated approach to the constantly increasing problem of obesity. The strictly nanomedical alleviation of chronic pain in the joints should be a small part, indeed, of a "treatment package" that includes medical nanotechnologies for monitoring and feedback, along with physical therapy, geriatric and socio-psychological approaches, together with even economic or political incentives for increased exercise, nanotechnologically improved footwear and surfaces.

References

[1]. Freitas Jr, Robert A. "What is nanomedicine?." Nanomedicine: Nanotechnology, Biology and Medicine 1.1 (2005): 2-9.
[2]. Shi, Jinjun, et al. "Cancer nanomedicine: progress, challenges and opportunities." Nature reviews cancer 17.1 (2017): 20-37.
[3]. Drexler, K. Eric. "Nanotechnology: from Feynman to funding." Bulletin of Science, Technology & Society 24.1 (2004): 21-27.
[4]. Riehemann, Kristina, et al. "Nanomedicine—challenge and perspectives." Angewandte Chemie International Edition 48.5 (2009): 872-897.
[5]. Pelaz, Beatriz, et al. "Diverse applications of nanomedicine." ACS nano 11.3 (2017): 2313-2381.
[6]. van der Meel, Roy, et al. "Smart cancer nanomedicine." Nature nanotechnology 14.11 (2019): 1007-1017.
[7]. Zhang, Chenyang, et al. "Progress, challenges, and future of nanomedicine." Nano Today 35 (2020): 101008.
[8]. Germain, Matthieu, et al. "Delivering the power of nanomedicine to patients today." Journal of Controlled Release 326 (2020): 164-171.
[9]. Lammers, Twan, and Mauro Ferrari. "The success of nanomedicine." Nano Today 31 (2020): 100853.
[10]. Bhatia, Sangeeta N., et al. "Cancer nanomedicine." Nature Reviews Cancer 22.10 (2022): 550-556.

Dr Meeta Rani. "Quality Life with Nanomedicine." *IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS),* 17(6), (2022): pp. 43-44.