

Novel Herbal Drug Delivery System: “An Review on Herbal Nanotechnology”

S. U. Kamble, Sanjay Bais, Pratiksha Bondar

Fabtech College of Pharmacy, Sangola, Solapur, Maharashtra, India
pratikshabond2000@gmail.com

Abstract: *This review research examines “Nanotechnology” as it stands today. It gives a brief introduction to nanotechnology and some of the industries where it has found use. Future potential for nanotechnology are also covered. Cancer is a major cause of death on a global scale. Of decrepitude in life and death. In the development of cancer medications, nanomaterials including carbon nanotubes, polymeric micelles, and liposomes have shown significant pharmacokinetic and pharmacodynamic advantages in the detection and treatment of cancer. In this article, we talk about the most popular Nanomaterials in the detection and treatment of cancer. numerous synthesis of nanomaterials Methods from both the top-down and bottom-up are considered. During the review, It is emphasised that nanoparticles have unique properties. Nanomaterials such as carbon nanotubes, polymeric micelles, and liposomes have demonstrated significant pharmacokinetic and pharmacodynamic benefits in the development of cancer treatments. Cancer screening and therapy. This article discusses the most well-liked Cancer detection and therapy using nanomaterials. Numerous nanomaterial synthesis Both top-down and bottom-up approaches are taken into consideration. Throughout the review, The distinct qualities of nanoparticles are emphasised. Biological sensors, modern medications, medical imaging, and many other things. There are currently a rising number of nanoparticles, nanowires, and other types of nanomaterials that could be used in biotechnological applications. Nanomachines, nanofibers, and nanostructures. The risk of poisoning from The development of nanoparticles has demonstrated that some materials have features that would need to be modified to some extent to prevent negative consequences and a risk of exposure. Although there are obstacles, the commercialization of The future of nanobiotechnological products seems promising, and within 10 years, many This kind of new products are likely to be accepted and used in international markets..*

Keywords: Nanofibers, Nanometers, Nanowires, Pharmacokinetic, Pharmacodynamic Nanoparticles, nanotechnology, and nanobiotechnology

REFERENCES

- [1]. Drexler, K. E., “Engines of Creation -The Coming Era of Nanotechnology,” Anchor, Reprint edition, New York, 1987:40-60.
- [2]. Nanotechnology Research Directions: IWGN Workshop Report – Vision for Nanotechnology R&D in the Next Decade,” WTEC, Loyola College in Maryland, M. C. Roco, S. Williams, and P. Alivisatos, Eds., September 1999; “National Nanotechnology Initiative: Leading to the Next Industrial Revolution,” A Report by the Interagency Working Group on Nanoscience, Engineering and Technology Committee on Technology, National Science and Technology Council, Washington, DC, February 2000:64-120.
- [3]. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018;68:394–424.
- [4]. Hu J, Huang W, Huang S, ZhuGe Q, Jin K, Zhao Y. Magnetically active Fe₃O₄ nanorods loaded with tissue plasminogen activator for enhanced thrombolysis. *Nano Research.* 2016;9:2652–61.
- [5]. Huang L, Hu J, Huang S, Wang B, Siaw-Debrah F, Nyanzu M, Nanomaterial Applications for Neurological Diseases and Central Nervous System Injury. *Prog Neurobiol.* 2017:21-40.

- [6]. Allmeroth, M., Moderegger, D., Gündel, D., Buchholz, H.-G., Mohr, N., Koynov, K., et al. (2013). PEGylation of HPMA-based block copolymers enhances tumor accumulation in vivo: a quantitative study using radiolabeling and positron emission tomography. *J. Control. Release* 1016 :77-85
- [7]. Fenske DB, Cullis PR. Liposomal nanomedicines. Expert opinion on drug delivery. 2008;5:25–44
- [8]. Malam Y, Loizidou M, Seifalian AM. Liposomes and nanoparticles: nanosized vehicles for drug delivery in cancer. *Trends in pharmacological sciences*. 2009;30:592–9.
- [9]. Bozzuto G, Molinari A. Liposomes as nanomedical devices. *International journal of nanomedicine*. 2015;10:975–99.
- [10]. Alturkistani, H. A., Tashkandi, F. M., and Mohammedsaleh, Z. M. (2016). Histological stains: a literature review and case study. *Glob. J. Health Sci.* 8.2016: 72–79.
- [11]. Liu Z, Chen K, Davis C, Sherlock S, Cao Q, Chen X, Dai H. Drug delivery with carbon nanotubes for in vivo cancer treatment. *Cancer Res.* 2008; 68:6652–6660.
- [12]. Robinson JT, Hong G, Liang Y, Zhang B, Yaghi OK, Dai H. In vivo fluorescence imaging in the second near-infrared window with long circulating carbon nanotubes capable of ultrahigh tumor uptake. *J. Am. Chem. Soc.* 2012; 134:10664–10669.
- [13]. Maruyama K. Intracellular targeting delivery of liposomal drugs to solid tumors
- [14]. Wen AM, Shukla S, Saxena P, Aljabali AA, Yildiz I, Dey S, Mealy JE, Yang AC, Evans DJ, Lomonosoff GP, Steinmetz NF. Interior engineering of a viral nanoparticle and its tumor homing properties. *Biomacromolecules*. 2012; 13:3990–4001.
- [15]. Malam Y, Loizidou M, Seifalian AM. Liposomes and nanoparticles: nanosized vehicles for drug delivery in cancer. *Trends in pharmacological sciences*. 2009;30:592–9.
- [16]. G, Molinari A. Liposomes as nanomedical devices. *International journal of nanomedicine*. 2015;10:975–99.
- [17]. Fenske DB, Cullis PR. Liposomal nanomedicines. Expert opinion on drug delivery. 2008;5:25–44.
- [18]. Malam Y, Loizidou M, Seifalian AM. Liposomes and nanoparticles: nanosized vehicles for drug delivery in cancer. *Trends in pharmacological sciences*. 2009;30:592–9.
- [19]. Bozzuto G, Molinari A. Liposomes as nanomedical devices. *International journal of nanomedicine*. 2015;10:975–99.
- [20]. Fenske DB, Cullis PR. Liposomal nanomedicines. Expert opinion on drug delivery. 2008;5:25–44.
- [21]. Muñoz JE, Cervantes J, Esparza R, Rosas G. Iron nanoparticles produced by high-energy ball milling. *J Nanopart Res* 2007;9:945-50.
- [22]. CC. Synthesis of nanostructured materials by mechanical milling: problems and opportunities. *Nanostructured Materials* 1997;9:13-22.
- [23]. Rastogi A. A mini-review practice of formulations of nanoparticles. *Int J Chem Synthesis Chem Reactions* 2017;3:1-7.
- [24]. Hans-Eckhardt S. *Nanoscience book* 2010;1
- [25]. Hari Singh Nalwa and Thomas W. *Cancer Nanotechnology book* 2006;1
- [26]. Alain N. *An Introduction to Nanoscience and Nanotechnology book* 2008;107-139.