

---

# EFFECT OF NANOTECHNOLOGY ON HERBAL DRUGS: A STATE OF THE ART REVIEW

**Abhishek Singh Rathore**

Department of Medical

Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

**ABSTRACT:** *Since ancient times, herbal medicines have been commonly used in the world and have been accepted by doctors and patients for their better medicinal value because they have less adverse effects compared to modern medicines. In order to improve patient compliance and prevent repeated administration, phytotherapeutics need a scientific method to deliver the components in a continuous manner. By developing novel drug delivery systems (NDDS) for herbal constituents, this can be done. In order to resolve non-compliance, NDDSs not only decrease repetitive administration, but also help increase the therapeutic value by reducing toxicity and increasing bioavailability. Nanotechnology is one such innovative approach. There is a possible future for nano-sized drug delivery systems of herbal drugs to boost operation and solve problems associated with plant medicines. In order to combat more chronic diseases such as asthma, diabetes, cancer, and others, the inclusion of nanocarriers as an NDDS in the traditional medicine system is therefore necessary.*

**KEYWORDS:** *Diseases, Herbal, Medicine, Nanotechnology, Remedies.*

## INTRODUCTION

Herbal remedies and natural products have been used since ancient times to treat diseases. The herbal treatments have thousands of constituents that all function simultaneously against the diseases, unlike the commonly used allopathic system. In order to improve patient compliance and prevent repeated administration, phytotherapeutics need a scientific method to deliver the components in a continuous manner[1]. By developing novel drug delivery systems (NDDSs) for herbal constituents, this can be done. In order to resolve non-compliance, NDDSs not only minimise repetitive administration, but also help improve the therapeutic benefit by minimising toxicity and increasing bioavailability, and so on[2].

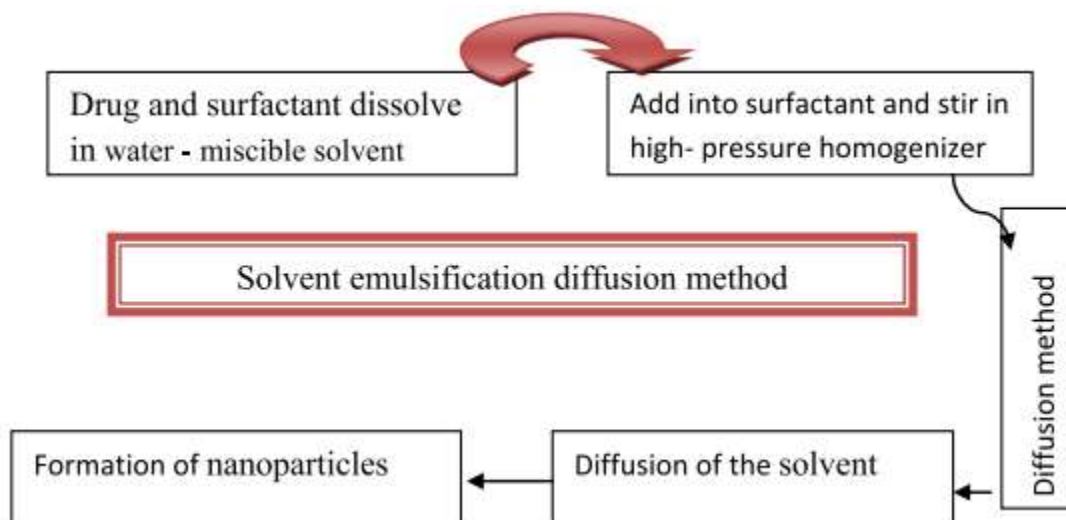


Figure 1: Illustrates the preparation of nanoparticle[3].

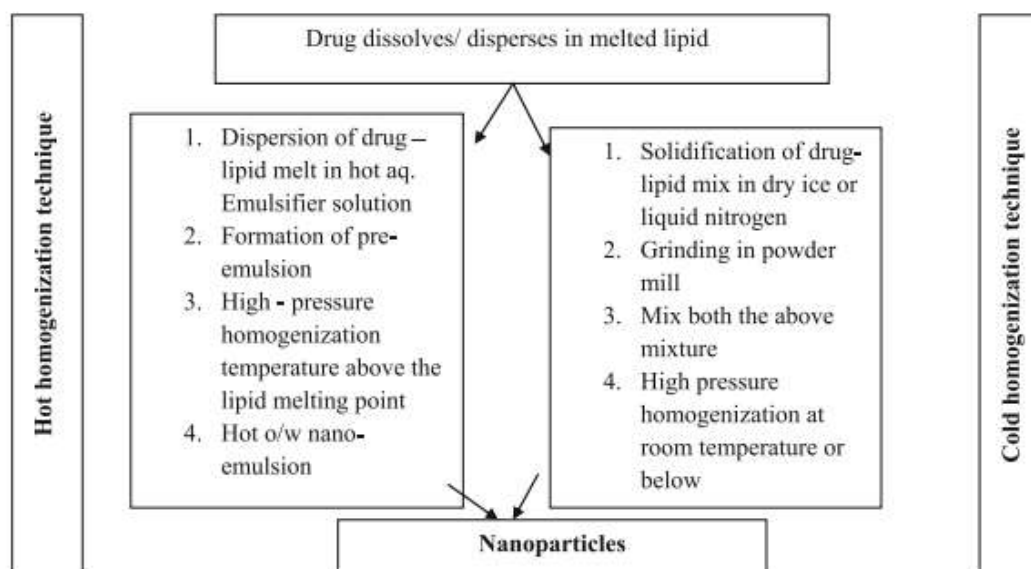


Figure 2: Illustrates the hot homogenization and cold homogenization loading techniques.

Due to their tuneable physicochemical and biological efficacy over their counterparts, nanoparticles or nano materials have gained major advances in nanotechnology. The key disadvantages of conventional nanoparticles are non-specific, lack of solubility and incapacity to penetrate the cells that give nanoparticles a great opportunity to play significant roles. Herbal medicines have been used extensively in the world since ancient times. For herbal remedies or traditional treatment methods such as Siddha and Ayurveda, herbal preparations are used in India. Today, since their

effects are known and side effects are very negligible, in the pharmaceutical industry, herbal medicines play a leading role.

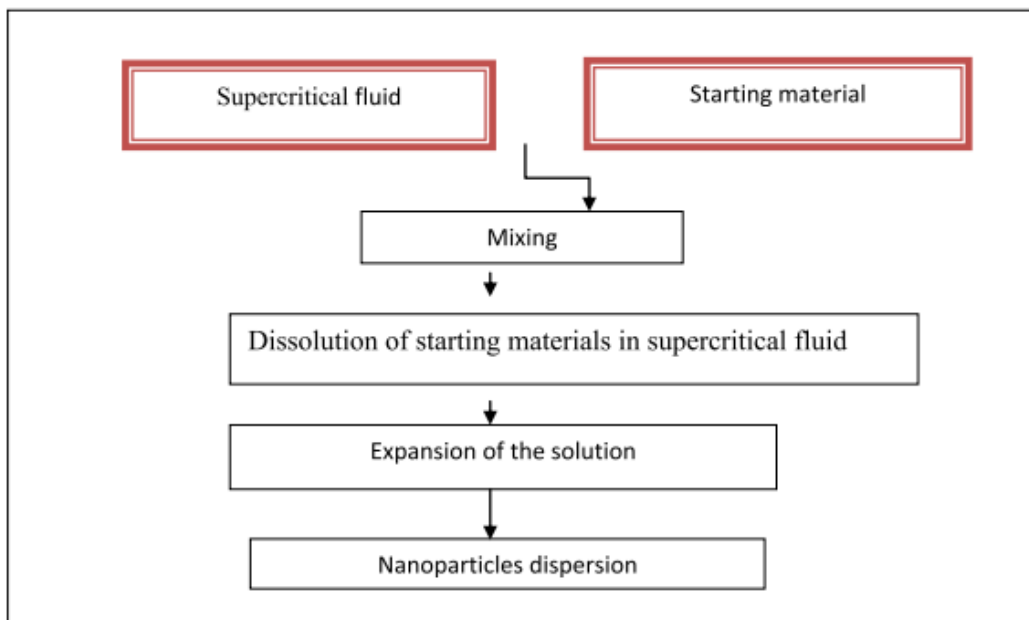


Figure 3: Illustrates the supercritical fluid extraction of emulsion[4].

### DISCUSSION

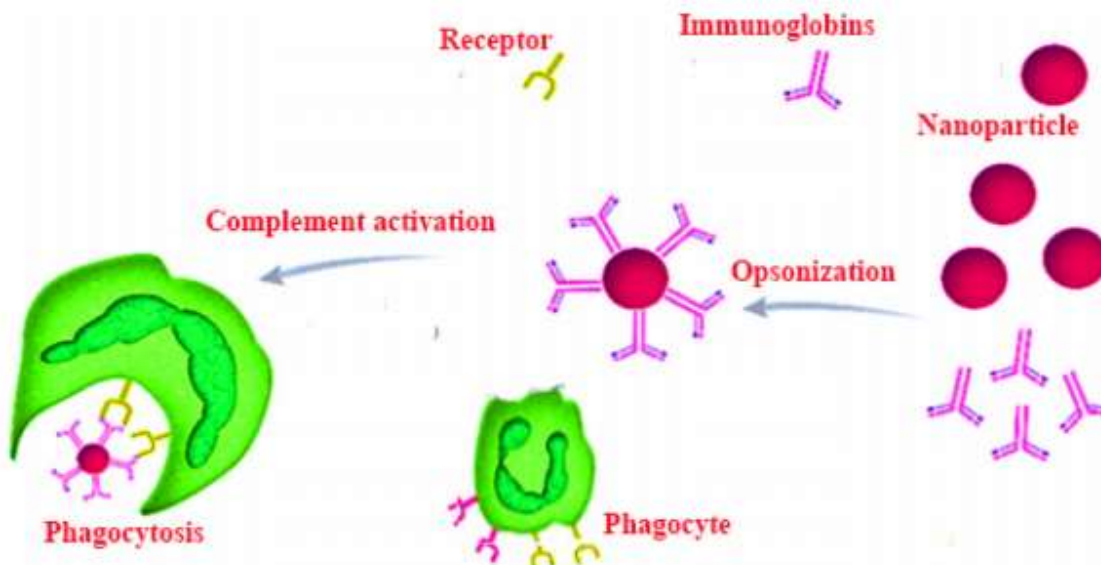
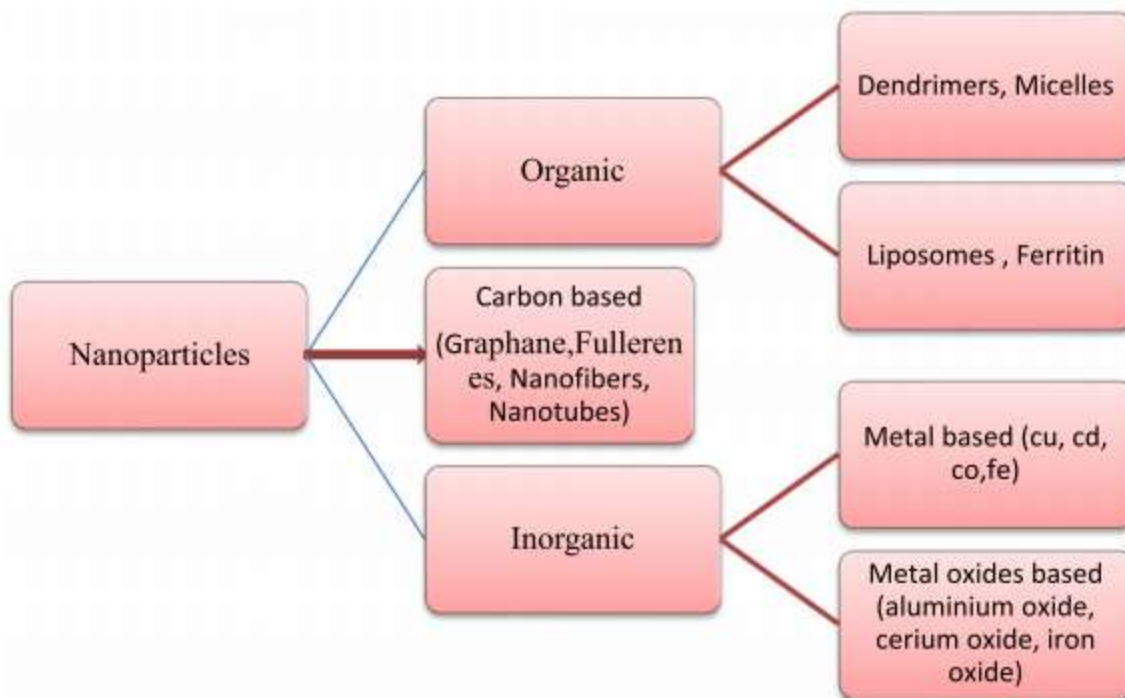


Figure 4: Depicts the Phagocytosis process of nanoparticles[5].



**Figure 5: Depicts the Nanoparticles' classification[6].**

There are some additional benefits to the introduction of herbal extracts into novel formulating systems, such as their bulk dosing and less absorption can be solved, which is the key problem faced, attracting the attention of major pharmaceutical firms[7]. The area of applied science and technology is nanotechnology, which aims to create devices and dosage forms in the range of 1 to 100 nm. The applications of nanotechnology have recently been referred to as nanomedicine for the treatment, diagnosis, monitoring and control of biological systems. Safe materials, including synthetic biodegradable polymers, lipids, and polysaccharides, have been made from nanocarriers. Figure 1 illustrates the preparation of nanoparticle. Figure 2 illustrates the hot homogenization and cold homogenization loading technique. Figure 3 illustrates the supercritical fluid extraction of emulsion. Figure 4 depicts the Phagocytosis process of nanoparticles. Figure 5 depicts the Nanoparticles' classification[8].

## CONCLUSION

Studies on herbal remedies and natural products have been carried out all over the world. The development of herbal remedies in the drug delivery system is being performed at basic and clinical trial levels in a number of institutes. The only requirement is the development of improved mechanisms for the proper delivery of these drugs in doses at the sites and across the body that do not interfere with the current care. It is very beneficial to do something that can not only mitigate side effects such as toxicity and hypersensitive reactions, but also improve the intensity of the

patient from inside. In the future, several possible research groups may also be intrigued by the idea of herbal nanoparticles for cancer drug delivery and may potentially create attention-grabbing results.

## REFERENCES

- [1] S. H. Ansari, F. Islam, and M. Sameem, "Influence of nanotechnology on herbal drugs: A Review," 2012, doi: 10.4103/2231-4040.101006.
- [2] R. Sridhar, R. Lakshminarayanan, K. Madhaiyan, V. A. Barathi, K. H. C. Limh, and S. Ramakrishna, "Electrosprayed nanoparticles and electrospun nanofibers based on natural materials: Applications in tissue regeneration, drug delivery and pharmaceuticals," *Chemical Society Reviews*. 2015, doi: 10.1039/c4cs00226a.
- [3] R. Arun, R. B. Sravya, and C. Roja, "A Review on Standardization of Herbal Formulation," *Int. J. Phyther.*, 2012.
- [4] 6(1). <http://doi.org/10.1186/s13613-015-0104-6> Deye, N., Vincent, F., Michel, P., Ehrmann, S., Da Silva, D., Piagnerelli, M., ... Laterre, P.-F. (2016). Changes in cardiac arrest patients' temperature management after the 2013 trial: Results from an international survey. *Annals of Intensive et al.*, "Immunomodulation of CD4 count by phela, an herbal extract," *Clin. Pharmacol. Drug Dev.*, 2013.
- [5] 6(1). <http://doi.org/10.1186/s13613-015-0104-6> Deye, N., Vincent, F., Michel, P., Ehrmann, S., Da Silva, D., Piagnerelli, M., ... Laterre, P.-F. (2016). Changes in cardiac arrest patients' temperature management after the 2013 trial: Results from an international survey. *Annals of Intensive et al.*, "Exploring medicine information needs of hypertensive patients using short message service (SMS) of mobile phone," *Pharmacoepidemiol. Drug Saf.*, 2012.
- [6] 6(1). <http://doi.org/10.1186/s13613-015-0104-6> Deye, N., Vincent, F., Michel, P., Ehrmann, S., Da Silva, D., Piagnerelli, M., ... Laterre, P.-F. (2016). Changes in cardiac arrest patients' temperature management after the 2013 trial: Results from an international survey. *Annals of Intensive et al.*, "Bloodstream infections related to central venous catheters in children with cancer-experience in a single south african centre," *Pediatr. Blood Cancer*, 2013.
- [7] S. Kumar, A. Gupta, and A. Arya, *Triple Frequency S-Shaped Circularly Polarized Microstrip Antenna with Small Frequency-Ratio*. 2016.
- [8] E. N. Kumar and E. S. Kumar, "A Simple and Robust EVH Algorithm for Modern Mobile Heterogeneous Networks- A MATLAB Approach," 2013.

