

# The Equation of Drug Dynamization of Homoeopathic Medicine on the Theory of Nanotechnology

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## Abstract

“Homeopathic Drug Dynamisation” is a process by which the medicinal properties which are latent in natural substances while in their crude state, become awakened and developed into activity to an incredible degree.<sup>1</sup>

Nanotechnology employs substances comprising particles of one to 100 nanometres (nm) in size, in other words, finely powdered ‘dusts’. These are generally manufactured, and do not occur in nature, although natural materials of small particle size are included in the definition.

In this article, this is explained in a scientific way and indicated how the potencies, i.e., the powers of the homeopathic medicines have to be worked on basis of the scientific rules including nanotechnology principle. These unique properties of nanoparticles would help to resolve the question that was raised against the homoeopathy (regarding presences of particle in physical form). Surprisingly, advances in conventional drug targeting and safety, herbal product delivery into the body and the nature of homeopathic remedies all converge in the fields of nanotechnology and nano-medicine.<sup>2</sup>

**Keywords** -.Homoeopathy, Nanoparticle, Potentization, High dilution. , Nano medicine, Homeopathic medicine, , Nano pharmacology, Exclusion zone, Homoeopathic drug ,Drug dinamization, Homoeopathic Pharmacology, Homoeopathic scientific research.

## Introduction-

Dr. Hahnemann first introduced the theory of dynamisation in 5th edition of Organon. In his book “Materia Medica Pura” (Aphorism § 269- The homoeopathic system of medicine develops for its use, to a hitherto unheard-of degree, the spirit-like medicinal powers of the crude substances by means of a process peculiar to it and which has hitherto never been tried, whereby only they all become penetratingly efficacious and remedial, even those that in the crude state give no evidence of the slightest medicinal power on the human body) , he explained the power of dynamisation in the year 1826 as well as in 1827. Since the year 1796, Dr. Hahnemann prescribed homoeopathic medicines in crude form which lead to unwanted sufferings to patient called aggravation. This unwanted phenomenon led him to think upon the concept of dilutions. Dr.Hahnemann was experimenting on the curative effect of homoeopathic medicines in smallest doses. He prescribed the drug Arnica in 18th&Nux vomica in 9th dilutions itself in the year 1812. With this discovery, Dr. Hahnemann identified that some inert substances eg. common salt, charcoal, lycopodium, silicea etc, when triturated with sugar of milk, became efficient medicines. Because of such miraculous experiences, he started calling his medicine as dynamisations & not dilutions. Because of dilution, toxic effects of that crude substance is removed, but

Dr. Hahnemann observed that they lost their healing benefits also. So the theory of Drug Dynamisation is very essential in homeopathic practice .

According to Dr. Stuart Close, “Homeopathic potentisation” is a mathematico-mechanical process for the reduction, according to scale, of crude, inert or poisonous medicinal substances to a state of physical solubility, physiological assimilability and therapeutic activity and harmless, for use as homeopathic healing remedies.

Drugs are potentised by two methods:

Trituration

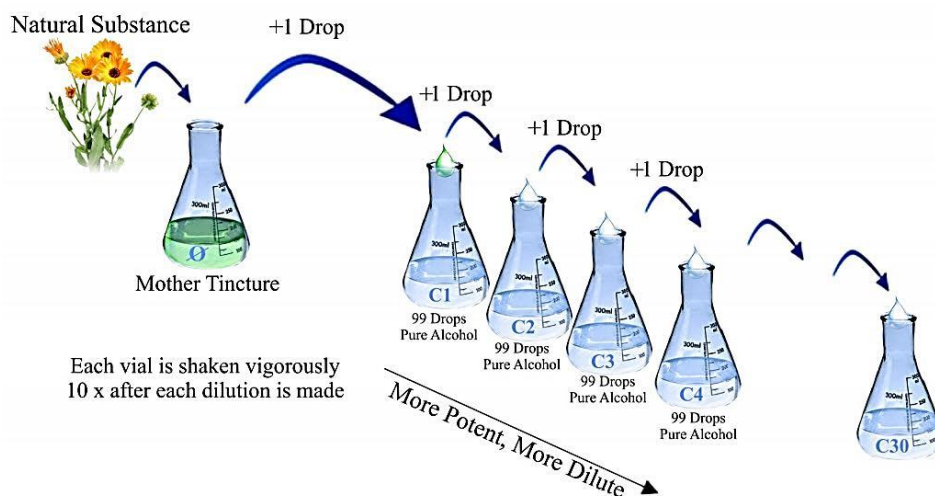


Succussion



1. Trituration - in case of insoluble substances.
2. Succussion - in case of soluble substances.

The termed this pharmaceutical process of dilution and succussion (or trituration) as “potentization” the greater number of potentization sled to longer and deeper effects of the drugs and the need for reduced repetition of them. But once a medicinal agent is diluted in the ratio of 1:99 12 times (i.e., in its 12C potency) or in the ratio of 1:9 24 times (i.e., in its 24X potency), according to Avogadro’s number, there would be in high probability no remaining molecules of the original medicinal agent (i.e., source-drug) in the solution. (Avogadro’s number -The laws of chemistry state that there is a limit to the dilution that can be made without losing the original substance altogether. This limit, which is related to Avogadro's number ( $6.023 \times 10^{23}$ ), corresponds to homeopathic potencies of 12C or 24X (1 part in 1024).



Homeopathy is a form of nano pharmacology. Potentization was the most significant, although controversial amongst Hahnemann's discoveries. Homeopathy is debatable because high-potency medications have large dilution factors that are several orders of magnitude more than Avogadro's

number, implying that no measurable residues of the initial components should exist. Nature and bioactivity of serially diluted and succussed solutions used in homeopathy.

## **Research on Homeopathy Drug dynamization & Nano technology**

### **1) Nanoparticle-Exclusion Zone Shell model-**

“The Nanoparticle - EZ Shell Model” is developed. The goal is to understand the retention of memory of a source drug through serial succussed dilutions, where it physically no longer remains. This model suggests that during a few initial dilutions, nanoparticles adsorb the source drug which modifies their structure. Such nanoparticles, along with the adsorbed source drug as nucleator build up modified EZ shells around them, the structurally modified nanoparticles and their modified shells have information about the source drug in “crude and condensed” form. In successive dilutions, during violent strokes at each dilution, the modified EZ shells strip off to spread as further modified EZ templates to nanoparticles present in that dilution, modifying their structures accordingly. Thus the source drug information passes, “developing” from one dilution to the next, beyond even Avogadro.

Pure water is neither affected by magnetic field nor keeps memory of its past experience. But amazingly, this property of water alters if it is exposed to air (oxygen), as liquid crystalline exclusion zones (EZ) build up, especially around nanoparticles present as impurities.

The EZ could contain surface-specific information. Based on these facts and on certain pharmaceutical and clinical observations in homeopathy,

The Nanoparticle-Exclusion Zone Shell Model may be an important step toward explaining the nature and bioactivity of serially diluted succussed solutions used as homeopathic medicines. This model may also provide insight into the workings of hormesis (an adaptive response of cells and organisms to a moderate-usually intermittent stress). Hormesis is the primary phenomenon through which homeopathic phenomenon may have evolved exhibiting the principle of similars.<sup>34 5</sup>

### **2) Molecular mechanism of action of potentized homeopathic drug-**

The objective of this experimental study was to examine validity of the “gene regulatory hypothesis” to explain mechanism of action of ultra-highly diluted remedies in living systems. The research conducted in Animal models in vivo like mice, rats, human subjects and bacteria, bacteriophage and yeast were used as materials; normal and cancer cells were used for in vitro experiments. Suitable controls were maintained. Various modern cytogenetic (CA- a simple method for measuring DNA strand breaks in eukaryotic cells, MN- micronucleus, SHA- Sinusoidal Harmonic Acceleration, MI- Molecular Intelligence, Comet assay etc) and molecular biology techniques (RT-PCR, microarray analysis, signal pathways, DNA methylation and histone acetylation) were used apart from compound and electron microscopies (scanning, transmission, atomic force and confocal) and immunochemical assay. Simple innovative techniques for nano encapsulation of and nano precipitation by homeopathic mother tinctures and their biologically active components were also used to reveal some unexplored aspects.

The study Results showed Ultra-highly diluted homeopathic remedies could trigger ameliorative effects in various model test organisms while succussed alcohol (placebo) could not. Potentized remedies could repair / protect radiation induced DNA and tissue damages and antagonize/ameliorate several types of experimentally induced tumors/cancers in mice; certain remedies demonstrated apoptotic effect on cancer cells in vivo and in vitro while succussed alcohol failed to show such effects. Expression of

some key signal proteins and mRNA expressions in experimental models could be modulated by potentized homeopathic drugs. Under arsenic stress, *Escherichia coli* and *Saccharomyces cerevisiae* responded favorably to potentize homeopathic remedies. Certain potentized drugs (30°C) demonstrated favorable changes in gene expression profiles of cancer cells in microarray analysis.

This experiment Concluded as Overall results provide convincing evidences of potentized remedy's ability to trigger favorable regulatory changes in gene expressions, possibly through epigenetic modifications.<sup>6</sup>

### 3) Presence of Silicon Rich Crystal nanoparticles in Homoeopathic medicine -

This research was done to investigate a possible nanoscience mechanism of action of homoeopathic medicines (conducted on pulsatilla, colchicum, Belladonna).

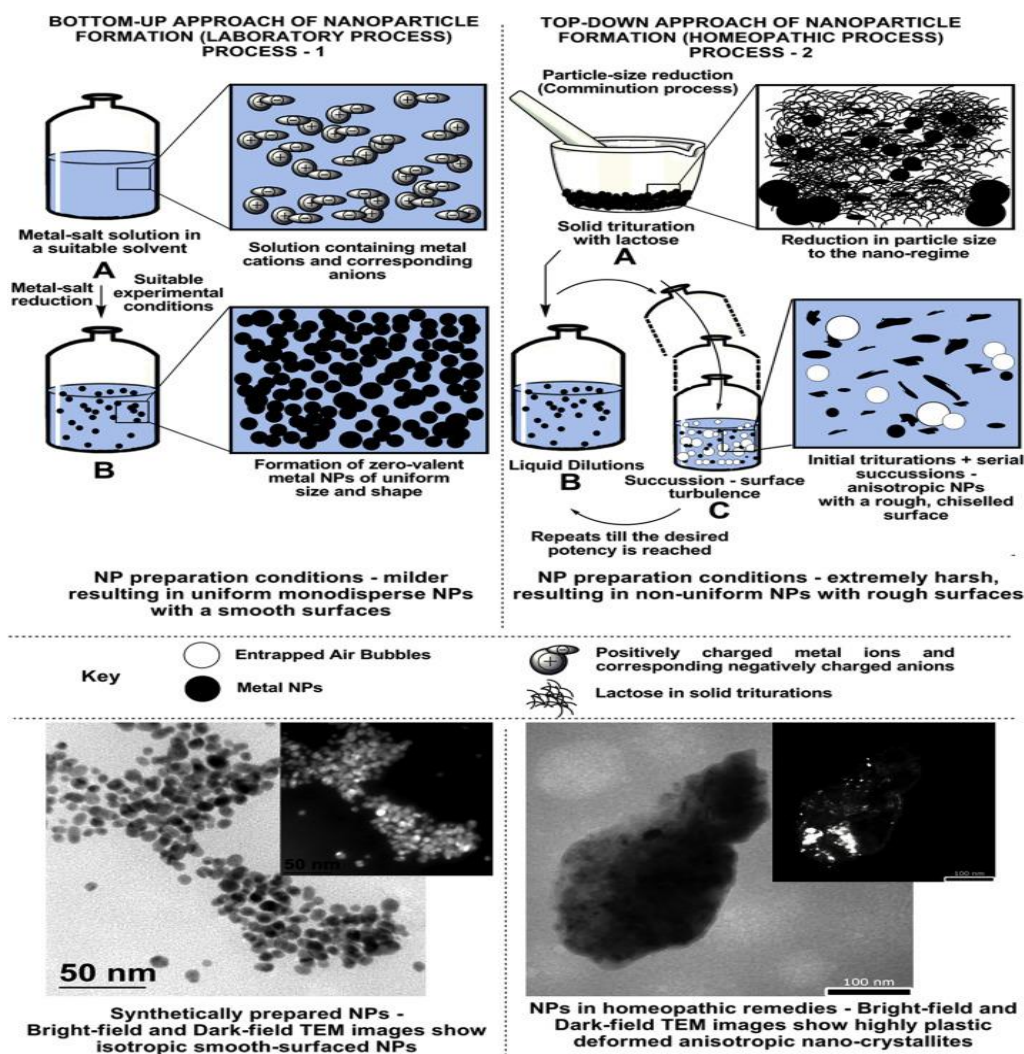
For this, ultra-pure samples were prepared and examined under scanning and transmission electron microscope (SEM and TEM), Selected Area nano Diffraction (SAD), Energy Dispersive X-ray analysis (EDX) and Trace Element analysis (TEA) was performed.

In this research image of Water 14cH (pure water used as starting-material), Colchicum 15cH , Pulsatilla 15cH. (homeopathic medicine)showing nanomaterials. under the Scanning ElectronMicroscopic (SEM) &Transmission electron microscope (TEM), also this research evaluate under Scanning electron microscope (SEM) image of Colchicum 15cH control prepared in plastic vials showing nanomaterial appearance differs from samples prepared in glass vials.

The Trace analyses results showed Samples prepared in glass vials where agitation (strong strokes) was performed (namely, homeopathic medicines and potency of water) had high and nearly the same silicon content. Dilutions without agitation, which are not homeopathic medicines, had one-third silicon content compared to samples prepared in glass vials where agitation was performed. Dilutions with agitation (i.e. potencies) in plastic exhibited the lowest silicon content. Therefore, TEA for silicon confirms the high presence of silicon in homeopathic medicines (potencies) compared to controls(without agitation). It is obvious that silicon leaches from the glass wall of vials, especially during the strokes of potentization irrespective of the starting-substance.<sup>7</sup>

Conclusion of this experiment calculate that During the strong strokes of potentization, the nanoparticles might acquire the information of the diluted away starting-source encrypted on them by means of epitaxy(crystal growth or material deposition in which new crystalline layers are formed with). As various forms of silica are known to interact with proteins and cells of the immune system, these nanoparticles (along with the interfacial water on their surface) might also act as carriers of this information to the target. The 'size' of information might be related with the dilution degree of medicines. Under such possible conditions, homeopathy qualifies as a nanomedicine system not requiring high technology.<sup>7</sup>





#### 4) Nanoparticle-allostaticcross-adaptation-sensitization (NPCAS) Experiment model-

There are four principles of the nanoparticle-allostatic (“achieving stability through change”) cross-adaptation-sensitization(stimulate) (NPCAS) model that explain homeopathic remedy action:

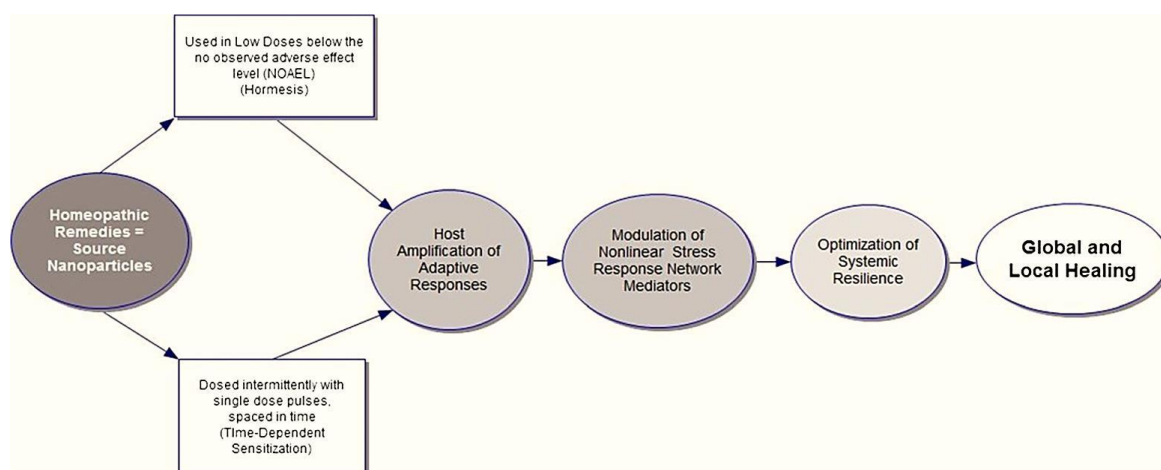
(A) Homeopathic remedies are highly reactive source and/or remedy-modified silica (or polymer) nanoparticles, not bulk-form drugs.

(B) Remedy nanoparticles stimulate a complex adaptive response in the organism that begins in the all static stress response network, with flowing indirect consequences over time across the entire self-organizing organism. The homeopathic simillimum (clinically optimal) remedy nanoparticles serve as low level, but highly salient novel stressors, i.e., specific biological signals for the overall organism.

(C) The adaptive plasticity processes that underlie the direction and magnitude of remedy effects on living systems involve nonlinear physiological phenomena such as hormesis (an adaptive response of cells and organisms to a moderate -usually intermittent stress), cross-adaptation, time-dependent sensitization and cross-sensitization/oscillation. As a low intensity stressor (causes a state of strain or tension.), remedy nanoparticles stimulate changes in the opposite direction to those of the higher intensity stressors that fostered the original development of disease. The disease-related maladaptations prime the system. Then the correct remedy in low dose elicits reversal of direction of the maladapted responses.

(D) The adaptive changes that the remedy evokes ultimately strengthen systemic resilience. The successfully treated individual can resist and rebound from subsequent challenges from higher intensity homeostatic(The state of steady internal, physical, chemical, and social conditions maintained by living systems.) disruptors of the organism as a complex network, at global and local levels of organizational scale.

The proposed model suggests that homeopathy is not only scientifically “plausible,” but also grounded in an extensive empirical research literature. Homeopathic remedies come into existence and exert their biological effects mainly as nanostructures. Physiology, not pharmacology, is the most relevant discipline for studying remedy nanoparticle actions (cf., [184,187]). This literature insists on logic and rationality, as well as openminded thoughtfulness, in evaluating the scientific implications of a large body of interdisciplinary evidence that health researchers might not otherwise assemble to understand homeopathic remedies.<sup>12</sup>



**Figure 1 Nanoparticle model for homeopathic remedy action: hormesis, allostatic cross-adaptation, and time-dependent sensitization of the nonlinear stress response mediator network. Global and local healing occur across the person as a self-organized complex adaptive system in response to the individualized remedy serving as personalized hormetic stressor, i.e., holistic nanomedicine: an exogenous nanoparticle stimulating self-amplified, bidirectional adaptive change<sup>12</sup>**

There also many in vivo and in vitro studies has been conducted those based on Molecular mechanism of action of potentized homeopathic drug.

Ultra-highly diluted homeopathic remedies could trigger ameliorative effects in various model test organisms while succussed alcohol (placebo) could not. Potentized remedies could repair / protect radiation induced DNA and tissue damages and antagonize/ ameliorate several types of experimentally induced tumors/cancers in mice; certain remedies demonstrated apoptotic effect on cancer cells in vivo and in vitro while succussed alcohol failed to show such effects. Expression of some key signal proteins and mRNA expressions in experimental models could be modulated by potentized homeopathic drugs. Under arsenic stress, Escherichia coli and Saccharomyces cerevisiae (yeast) responded favorably to potentize homeopathic remedies. Certain potentized drugs (30°C) demonstrated favorable changes in gene expression profiles of cancer cells in microarray analysis. The Overall results provide convincing evidences of potentized remedy’s ability to trigger favorable regulatory changes in gene expressions, possibly through epigenetic modifications.<sup>13</sup>

**Conclusion:**

“We are in a position to conclusively prove the presence of nanoparticles in all the high dilutions of homeopathic drugs,”

A research conducted at the Mahatma Gandhi University, Kottayam, has proved that homeopathic medicines contain nanoparticles that are vital for medical treatment.

The study conducted by Dr E S Rajendran at the Nano-Science Lab of the university, using ‘Aurum Metallicum (6C to CM potency)’, has conclusively proved that homeopathic dilutions contain nanoparticles. The dilutions were studied under high-resolution transmission electronic microscope (HRTEM) and energy dispersive spectrometer (EDS).

Homeopathy is full of seemingly strange paradoxical observations. These observations should be exploited scientifically for the clues they provide. The proposed many research modals are rational base for doing so. Exploring homeopathy in this way is likely to open new research activities in nanoscience and water, which may lead to scientific development of homeopathy at par with modern medicine. Further, the observed memory retention phenomenon does not seem exclusive to medicine and could have wider applications in our life.

Clinical trials, as used in modern medicine, should be modified in a way they could be able to test the efficacy of the hormetic or homeopathic medicines. These trials are not only essential to adequately and accurately assess these medical interventions but also are important to convince the general public and policymakers of how much homeopathy and hormesis have a place in medicine and science. While synthetic nanomedicine carries drug material to the target inside the organism under reductionist approach, homeopathic nanomedicines seem to carry drug-specificin formation in an amplified form to the organism under the holistic approach.

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1. Organon of Medicine:Sixth edition – Dr.Samual Hahnemann
2. Principles and practice of homoeopathy – Richard Hughes
3. Genius of homoeopathy – Stuart Close
4. The principles and the art of cure by homoeopathy – H. A. Roberts