

## WHETHER THE MEDICINES ARE TRULY NONMOLECULAR?

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### ABSTRACT

Benveniste's theory of "memory of water" is actually an elaborated version of "tuned solvent hypothesis". The author has forwarded some evidences so that the hypothesis seems to be unconvincing. Ritualized succussion and centesimal dilution actually creates some sorts of non-homogeneity in the medicinal solution and molecular packing of the drug molecules ultimately makes the drug action possible. Competitive binding of the drug molecules with metabolically important subcellular enzymes produce 'artificial disease' in provers. Minute application of the same brings 'gentle cure' to the patients due to stimulation of vital reactions.

**Key words :** Non-homogeneity, Micelle, subcellular enzymes,

### Introduction:

It can mathematically be proved that if we start diluting a substance from one mole original tincture, after 12th centesimal dilution there would be no trace of even single original molecule. Spectrophotometric analysis cannot detect any molecule even after 7th or 8th dilution. There should be no controversy that molar concentration of a solution falls steadily with increase of dilution unless there are ritualized succussions present between each steps of dilution. Whether the process of succussion helps in "tuning" of the solvent molecules or it prevents the attainment of non-molecularity is our topic of discussion.

### Materials and Methods:

The case history of eight patients living in the same house infected with flue was studied at the beginning of winter season. All of them were found suffering from the symptoms of Bryonia. Symptoms of all the patients were almost identical because the

'contagious principle' (here subtype of influenza virus) was the same. The patients were divided into two equal halves, group A and B, without making them informed about such discrepancy.

Now, a small vial of Bryonia 30, succussed ten times was kept upon a table. First drop of the liquid was taken out of the vial with a dropper, mixed with 99 drops of fresh alcohol (RS) in a new vial and again succussed ten times as well and thus 31st potency was prepared. The vial was then marked with a label "sample 1". Now the 2nd to 99th drops of the original medicine was lifted one after another by repeated attempts with a dropper and discarded. Another 31st potency Bryonia sample was prepared from 100th drop and it was labeled as "sample 2".

Group-A patients were treated with sample 1 and Group-B patients with sample 2, twice a day.

**Result :**

After 24 hours the progress of recovery of both the groups were recorded. For Group-A all the symptoms of influenza were almost disappeared, but three of the Group-B patients were found suffering from fever with violent coughing and one was suffering from malaise. Then the affected group was treated with sample 1 and all the symptoms were ameliorated within 24 hours.

**Discussion :**

Several workers have hypothesized different theories to explain the activities of homeopathic drugs. They have a basic point of similarity because most of them advocate in favor of "tuned solvent hypothesis", which was developed much earlier, to describe the special properties of a solvent gained by pre-existing solutes. It postulates that the process of vibration of solute molecules makes the water crystal structure modified or "tuned" in such a manner that even in the absence of solute infinitesimally diluted solution shows some special activities on living beings. According to some of them vibratory motion of a molecule increases when it absorbs energy, and can re-radiate it at a later date, usually in the infrared part of the spectrum, where heat is also found. It is proposed that during the collision process, vibratory energy is exchanged between the source drug and the water, so that the water is left with a vibratory imprint of the drug. Further succussion makes the imprint deeper, which explains why the medicines are regarded as acting more strongly as the dilution increases<sup>1</sup>. The prestigious British research journal "Nature"

published experimental results<sup>2</sup> of a research group guided by Dr Jacques Benveniste in 1988, was based on "memory" of such "tuned" water, which is very close to the basic principles of homeopathy. Where they confirmed the biological activities, i.e., basophil degranulation by "nonmolecular" dilution of crystallizable fragment of an antibody (anti IgE). The article has later been challenged, criticized and rejected by several scientists including the Deputy Editor of "Nature" itself. Supporters of Benveniste still believe that when water molecules are succussed with a solute imprint of the same remain stored electronically upon water molecules like compact discs. Biological system acts as CD-players when such "tuned" water molecules are entered into the same. A number of workers have<sup>3-5</sup> shown that infinitesimally diluted solutes bring structural changes in the water crystals by the slight rearrangements of hydrogen bonds between water molecules. Thus a number of water crystals could be formed. Since water molecules are in continuous motion in the liquid state these hydrogen bonds are constantly and rapidly being broken and reformed. Liquid water therefore is an equilibrated mixture of two such types of icosahedral clusters - expanded network and collapsed network. The outer structure two-state mixture model has been successfully used to explain many of the anomalous properties of water<sup>6-10</sup> including "tuned" solvent hypothesis; where water can act as a carrier of nonmolecular signal. Some authors have discussed how such "tuned" water molecule can bring visible biological response by influencing on mechanistic pathway of living systems. According to them water molecules becomes disorganized in diseased cells<sup>11</sup> of patients, so that ions cannot properly pass inside through the membrane pore after shedding their own hydration sheath outside. Hence the properly organized 'healthy' water 'tuned' with medicinal property that comes from homeopathic medicine reorganizes the hydration sheath ensuring the proper passage of ions like sodium, potassium, chloride etc into the cell and helps in recovery of patients.

However, explanation of homeopathy on the basis of water crystals<sup>12-13</sup> and "tuned solvent hypothesis" seems to be unconvincing because-

1. Even the purest water in world is to some extent contaminated by minute particles. If not, when it enters into living cell it becomes contaminated at the moment.
2. It is well known that several chemical substances (e.g. camphor, spicy food, odorous water, perfumes etc) can disturb the effectiveness of homeopathic drugs on the patients. Hahnemann has also admitted the same ("Organon", 5th ed §125, 259). It is not supportive to non-molecular nature of medicine.

3. It cannot satisfactorily answer the cause of appearance of proving symptoms ('artificial disease') in healthy persons by the application of 'healthy water'.
4. It also cannot provide a self-explanatory answer about what happens to such 'healthy water' molecules in higher potencies, conversely it had to depend on some controversial theories, which have not even been scientifically accepted.
5. If we consider "tuned" solvent the sources of all information it would be very much transitory and unstable in nature. Moreover, a solvent cannot gather the total information of a complete molecule. If it does so, how would it be able to transmit information to living individual is not clear.
6. How could such a wide variety of energetically permissible crystals of water would be formed to preserve all the information of homeopathic drugs is not clear. At least it would not persist in a two-year old homeopathic medicine in the dispensaries.
7. Water crystals appear to be artifacts. When the 'non-molecular' medicine is applied to human body, the effect of body fluid ions may immediately nullify them. If we presume that water does store and transmit information, concerning solutes, by means of its hydrogen-bonded network; then also solutes of the body fluid may re-equilibrate them and form new clustered network with altered information.
8. As we all know that TV broadcasting stations can transform image of an object into ether waves, which later may be converted into the original image by TV monitors, a floppy can transfer information from one computer to another, but how hydrogen bonded network of water crystal can retain highly specific information of thousands of homeopathic medicines and how does it converted again into original information in human body is difficult to explain.
9. Temperature, pressure, magnetism etc can change the equilibrium condition and that may last for weeks even in the absence of these factors. This has been explained as the probable cause of memory of water. Pulsed NMR study reported that succussion itself might also have an effect on structuring and destructuring of the hydrogen-bonded network<sup>14</sup>. Such mechanically induced hydrogen bond breakage has been reported to last for weeks<sup>15</sup>. So that the role of succussion on pharmacodynamic property of water remains unclear.
10. Dilution is never considered to be perfect, particularly at low concentrations, where surface absorption may well be a major factor, so that dilution beyond the levels that can be analytically determined remains unproven. Remaining material may be

responsible for perceived differences between preparations and activity. Of course the water used for dilution is not pure relative to the putative concentration of the 'active' ingredient; even the purest water in earth should be considered grossly contaminated. This contamination may well have a major influence, and itself be influenced by the structuring in the water it encounters. In a clinical trial, however, it does seem unlikely that this water should be significantly different from a proper aqueous control.

From even Hahnemann's time several doctors believed that at least a molecule of the initial substance remains in highly diluted solution<sup>16</sup>, but none were able to predict the probability that how "one molecule remains" in solution above 12th centesimal dilution. Spectrophotometry, as we have mentioned, could not detect any molecule, though non-detectable range of such a device cannot ascertain absence of molecule. However we have got the following evidences of presence of a molecule in homeopathic drugs

1. In 1952 Gay reported a continuation of his work with Jean Boiron<sup>17</sup>. They made a series of exhaustive investigations: they made into the DSI of serially agitated dilutions. From the writings of Harris L. Coulter<sup>18</sup> we come to know that Gay and Boiron staged a double blind demonstration in which they would select a flask containing a serially agitated dilution of sodium chloride diluted beyond Avogadro limit from six other flasks containing distilled water. They scored perfectly, finding the correct flask without any trouble in 100 out of 100 attempts in a double blind by using Gay's mercury armature galvanometer. American team later replicates the dielectric test. The discovery by Gay and Boiron was repeated again in 1966 by Albert Brucato of Norfolk and James Stephenson<sup>19</sup> of New York. Although Gay and Boiron used a modified galvanometer, Brucato and Stephenson used a Dielectric Tester of 50 Kilo Volt alternating current. They have reported the dielectric stress indices of infinitely diluted mercuric chloride, often used as homeopathic remedy. Later the work has been proved to be true by the findings of several workers<sup>20-23</sup>. Here they measured capacitance, resistance dielectric dispersion, H-ion concentrations, electrode potentials using an LCR bridge, time domain reflectance spectroscopy, digital pH meter, and non-polarising electrodes.
2. The model of "memory" as experimented by Benveniste was a biological one. Simultaneously there were experiments to establish a physical model. It was a pretty old claim that infinitesimally diluted homeopathic drugs could be detected by using sophisticated instruments. Young reported that high dilutes can be identified

using nuclear magnetic resonance spectroscopy (NMR)<sup>24</sup>. Mr. Yves Lasne a pioneer in this field, was a doctor of medicine in the Edouard Herriot Hospital of Lyons, doctor of science, who provided the detection technology and research methodology, based on measurement of NMR and beta radiation. As early as 1985 Lasne had repeated earlier work showing evidence of changes in the infrared spectrum of homeopathic solutions. Low resolution NMR of fixed magnetic flux can trace the presence of a minutest quantity known compound in a diluting sample, better than other spectroscopic methods. Lasne used the latter and that could differentiate the succussed dilution of distilled water and succussed dilution of nitric acid up to 60th centesimal dilution.

3. Different workers<sup>25-26</sup> have used classical immunopharmacological ex vivo models to evaluate the effect of highly diluted endogenous immunomodulators. Healthy mice treated with thymulin (a thymic hormone) 4,7,9 or 11th centesimal dilutions showed a significantly depressed specific humoral and cellular immune response with the highest dilutions, but the immunocompromised mice showed the opposite effect i.e., stimulation of humoral and cellular immune response. Some workers also have tested the effect of bursin on the humoral immune response of immunocompromised chickens<sup>27</sup>. Some chicken embryos were surgically deprived of the Bursa of Fabricius at 80 hours of incubation and then some of them were treated in ovo with 15th to 20th centesimal dilution of dilution bursin (a tripeptide isolated from the bursa of Fabricius of chicks: Lys-His-Gly-NH<sub>2</sub>), on 6th and 9th days of embryonic life and other set was kept non-treated. It was found that the bursin treated groups can form almost normal quantity of antibody against porcine thyroglobulin, but non-treated bursectomized groups cannot. In other experiments, a randomized control tripeptide (Trp-Leu-Leu-NH<sub>2</sub>) in high dilution was used. The latter tripeptide yielded no noticeable effect, therefore warranting the specificity of highly diluted bursin.
4. Radioprotection in BALB/c mice<sup>28</sup> by taking succussed water dilution (15C-20C) of a mixture of three endogenous molecules: thymulin, bursin, and interleukin-3 (a cytokine) before and after irradiation. Here immunodepression is caused by irradiation. Immune system regeneration was also observed noticeably in succussed water group than non-succussed water group by the follow up treatment of concanavalline A (a stimulating agent of T lymphocytes) or lipopolysaccharide (a stimulating agent of mouse B lymphocytes). Some other related findings provoked

the scientists to propose new models in favor of Benveniste affair as well as homeopathy, not fully supported by existing knowledge of science<sup>29</sup>.

Hence one thing has been proved that homeopathic drugs are not truly non-molecular, but cannot produce reproducible result that an allopathic medicine can. To solve the problem Chattopadhyay<sup>30</sup> has proposed fluvial concentration hypothesis in a British mainstream journal, which fits more accurately with almost all the available results of homeopathic dilutions including the present one. Presence of at least few molecules in infinitesimal dilution, if is proved, may give rise to a self-explanatory and workable hypothesis. In the next year Chattopadhyay<sup>31</sup> hypothesized that when hydrated drug molecules are acquainted with still more water molecules during infinite dilutions and ritualized succussion, their surface becomes supersaturated with water molecules, their solubility decreases due to fall in dielectric constant, homogeneity of the solution is lost, so that perfect dilution cannot be made and traces of drug molecule remains far above 12th centesimal dilution. Here, hydrogen bonding and van der Waals force of attraction between water molecules around the drug molecule play the key role in decreasing homogeneity of the respective solutions. Addition of ethanol in the aqueous solution makes the process easier, because ethanol has much lower dielectric constant value (=24) than water (=80) and there is a tendency of precipitation. Precipitating ability of alcohol is not a new concept. The method for precipitation of proteins from their aqueous solution by the gradual addition of cold ethanol<sup>32</sup>, as derived by Cohn in 1941, is a good example of secondary attainment of non-homogeneity. It is well known that higher alcohols form visible inverted micelle around water molecule. Ethanol being a smaller molecule also forms inverted micelle around hydrated drug molecules by the process of potentization the ethanol molecules become reoriented in a special capsule-like conformation (Fig. 1). Chattopadhyay compared the process of succussion to sonication that helps such a specialized orientation of ethanol molecules around the hydrated drug molecule. Increase of potency adds new ethanol molecule to the capsules. The number of ethanol molecules in protective covering increases in 2nd, 3rd, 6th, 12th and 30th potency proportionally, but after reaching 30th potency the protective capsule becomes so much tightly oversaturated with ethanol that addition of any further ethanol molecule would require several steps of potentization, i.e., 200th or 1000th potency. Hydrophilic interaction, hydrophobic interaction, van der Waals force and hydrogen bonding make the capsule stronger with increasing potencies and thus its penetration power through lipid bilayers of cell membrane increases. The capsule is not affected by any physical or chemical reactions in the body due to their capsulation and high speed. Practically nothing can prevent their free entry through the cell membrane. Homeopathic drugs contain several stressor molecules<sup>33-34</sup>.

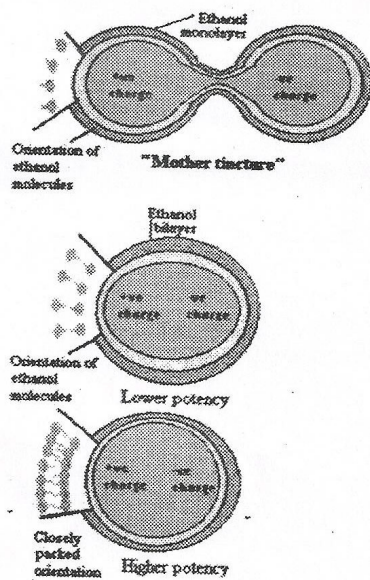


Figure 1 "Encapsulation" of drug molecules by potentization

An antigen, an inhibitor, a metal ion, a mineral, or even a small peptide molecule may act as a stressor, which may bring stress to the individual by binding with any minute protein factor located interior to the cell. It has been found that subcellular minute enzymes \*35, beyond the access of any allopathic drugs are mainly become affected by homeopathic medicines. Ultra-minute neuropeptides of brain may also fall under this category. When applied in high dose, the potentized medicines can bring some symptoms to the healthy persons (prover). If a patient shows exactly the same symptoms, minute application of the same remedy cures him.

In the present experiment the sample 1 medicine was a molecular one. It could reach the non-affected cells much earlier than virus can ('penetratingly efficacious'), and probably make them alert much before the incoming danger. Cure was practically not possible for sample 2 treated patients; because, due to secondarily achieved non-homogeneous nature of the medicinal solution the drug loaded ethanol capsules have flown away far before reaching 100th drop, and the sample 2 medicine became truly non-molecular and non-functional. The experimental result thus does not support 'tuned solvent hypothesis', but concludes that such "tuning" was practically possible by the presence of masked solute molecules.



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