



# homeopathic medicine

## is nanopharmacology

It was science fiction just ten years ago, but now the emerging science of nanotechnology is starting to make its presence felt. The study of how extremely small things can have enormous impact is spreading into medicine. **Dana Ullman, MPH**, invites us to look at homeopathy as a form of nanopharmacology.

**F**or centuries Western science has been marching towards the discovery of increasingly smaller particles of matter, from molecules and atoms to sub-atomic particles and quarks. Likewise, the evolution of technology has witnessed the miniaturisation of devices along with their increased capabilities. "Nanotechnology" has become the popular term to refer to the study and manufacture of devices of molecular dimensions, of the range of nanometres or one-billionth of a metre.

Dr Neal Lane, former director of the US National Science Foundation (NSF) said, "If I were asked for an area of science and engineering that will most likely produce the breakthrough of tomorrow, I would point to nanoscale science and engineering." (1)

A 1999 report from NSF Technology Council predicted that nanotechnology's impact on the health, wealth, and security of the world's population is expected to be "at least as significant as the combined influences of antibiotics, the integrated circuit, and human-made polymers". (2)

So far, research and development in nanotechnology in medicine have been limited to devices that monitor or replace biochemical processes in the body. But as yet, conventional scientists and physicians have not considered using nanopharmacological doses of medicinal agents.

Our conventional medical paradigm has tended to assume that increasingly large doses of pharmacological agents will create increasingly significant biological effects, even when it is well recognised that large doses of pharmacological agents do not necessarily lead to better or improved health.

In fact, increasing doses of most drugs generally lead to increased side-effects. Most drugs have primarily been developed to replace, suppress, minimise, or interfere with specific biochemical function, while the discovery of pharmaceutical medicines to augment a person's own immune and defence system has been an elusive and usually ignored goal.

Ironically, the few pharmacological agents that have been used in conventional medicine today that do something to augment a person's immune system are used in immunisation and allergy treatments, both of which are based on an ancient (and modern) pharmacological principle of "similars". (Although there are obvious similarities between these conventional medical treatments and homeopathic medicines, there are also significant differences, including the fact that homeopathic medicines are considerably smaller in dose and are individualised to the person's total syndrome of symptoms, not simply to a localised or defined disease.)

This concept of similars, that is, of using a medicinal agent in small doses based on what it causes in larger, toxic doses, represents the underlying principle of homeopathic medicine.

Largely as a result of the AIDS epidemic, it has made sense to seek to discover drugs that strengthen a person's immune and defence system rather than seek to minimise the various individual symptoms that a person experiences. However, most physicians and scientists lack a conceptual framework for pharmacological agents that have this effect. And sadly, most are also ignorant and disdainful of homeopathy, which they commonly but incorrectly assume, uses such small doses that the medicines cannot have any biochemical let alone clinical effect.

### Nanopharmacology and homeopathy

While this skepticism about the efficacy of small doses of medicine is understandable from a strictly rational perspective, it ignores the large body of evidence from basic science, controlled clinical studies, epidemiological data, clinical outcomes trials and historical review of the field.

Before discussing this evidence, it is useful to understand that homeopaths are the first to recognise that their medicines will not have any biological effect or clinical result unless the complex of symptoms that the sick person

experiences are similar to the complex of symptoms that the medicine has been found to cause when given in toxic doses. It is not as though small doses of simply any medicine will elicit therapeutic results; such small doses can and will only initiate a healing response when a person is hypersensitive to a specific medicine.

Basic principles of physics teach us that hypersensitivity exists when there is resonance. Homeopathy is itself based on resonance (commonly referred to as the "principle of similars"). Even the word "homeopathy" is derived from two Greek words, "homoios" which means similar, and "pathos" which means suffering or disease.

Typically, homeopaths engage patients in a detailed interview to elicit the various physical, emotional, and mental symptoms that the sick person is experiencing. Homeopaths seek to find a medicinal agent that has the capacity to cause in healthy people the similar symptoms that the sick patient is experiencing. Rather than treating localised symptoms or a specific disease, homeopaths treat syndrome complexes, of which the symptoms and the disease are a part. Once a conventional medical diagnosis is determined, the homeopath then seeks to find the symptoms that are unique to the patient, and then, a homeopathic medicine is individualised to each patient's symptom complex.

### Homeopathic medicine: a Nanopharmacology

Homeopathic medicine presents a significantly different pharmacological approach to treating sick people. Instead of using strong and powerful doses of medicinal agents that have a broad-spectrum effect on a wide variety of people with a similar disease, homeopaths use extremely small doses of medicinal substances that are highly individualised to a person's physical and psychological syndrome of disease, not simply an assumed localised pathology.

Homeopathic medicines are so small in dose that it is appropriate to refer to them as a part of a newly defined field of nanopharmacology. To understand the nature and the degree of homeopathy's nanopharmacology, it is important to know the following characteristics of how homeopathic medicines are made.

Most homeopathic medicines are made by diluting a medicinal substance in a double-distilled water. It should be noted that physicists who study the properties of water commonly acknowledge that water has many mysterious properties. Because homeopaths use a double-distilled water, it is highly purified, enabling the medicinal substance to solely infiltrate the water. The medicinal solution is usually preserved in an 87% water/alcohol solution.

Each substance is diluted, most commonly, 1 part of the original medicinal agent to 9 or 99 parts double-distilled water. The mixture is then vigorously stirred or shaken. The solution is then diluted again 1:9 or 1:99 and vigorously stirred. This process of diluting and stirring is repeated 3, 6, 12, 30, 200, 1,000, or even 1,000,000 times.

It is inaccurate to say that homeopathic medicines are just extremely diluted; they are extremely "potentised". Potentisation refers to the specific process of sequential dilution with vigorous stirring. The theory is that each consecutive dilution in conjunction with the process of shaking/stirring infiltrates the new double-distilled water and imprints upon it the fractal form of the original substance used (fractal refers to the specific consecutively smaller pattern or form within a larger pattern).

Some highly respected basic scientific research has begun to verify the claims that homeopaths have made for 200 years, and that various extremely low concentrations of biological agents can exhibit powerful biochemical effects.<sup>(3,4)</sup> Beta-endorphins are known to modulate natural killer cell activity in dilutions of 10-18. Interleukin-1, an important agent in our immune system, has been found to increase T-cell clone proliferation at 10-19. And pheromones, which are externally emitted hormones that various animals and insects are known to create, will result in hypersensitive reaction when as little as a single molecule is received (scientists have no way at present to assess the effects of less than a molecule).

It is commonly observed that organisms experience a biphasic response to various chemicals, that is, extremely small doses of a substance exhibit different and sometimes opposite effects than what they cause in high concentrations. For instance, it is widely recognised that normal medical doses of atropine block the parasympathetic nerves, causing mucous membranes to dry up, while exceedingly small doses of atropine causes increased secretions to mucous membranes.<sup>(5)</sup>

In fact, many medical and scientific dictionaries refer to "hormesis" or the Arndt-Schuls "law" as the observations that weak concentrations of biological agents stimulate physiological activity, medium concentrations of agents depress physiological activity, and large concentrations halt physiological activity.

There is also a significant body of research on hormesis (hundreds of studies) conducted by conventional scientists, none of whom even mention homeopathy<sup>(6,7)</sup>. The journal *Health Physics* devoted an entire issue to this subject in May, 1987.

Despite this body of research on hormesis, none of it was devoted to investigating the ultra-molecular doses used in some homeopathic

medicines. What is interesting to note is that researchers find that the hormetic effects of small doses only seems to influence biological systems when there is repeated dosages of the noxious (or medicinal) agent, while homeopathic clinicians find that the even smaller homeopathic doses have longer lasting effects, and do not require repetition of dosages.

### Clinical evidence

Homeopathy first became popular in Europe and the United States primarily because of the astounding successes it had in treating people during various infectious disease epidemics in the 19th century. The death rates in the homeopathic hospitals from cholera, scarlet fever, typhoid, yellow fever, pneumonia, and others was typically one-half to even one-eighth that in conventional medical hospitals.<sup>(8,9)</sup>

Similar results were also observed in patients in mental institutions and prisons under the care of homeopathic physicians as compared to those under the care of conventional doctors.

A group of researchers at the University of Glasgow and Glasgow Homeopathic Hospital conducted four studies on people suffering from various respiratory allergies (hay fever, asthma, and perennial allergic rhinitis).<sup>(10)</sup> In total, they treated 253 patients and found a 28% improvement in visual analogue scores in those given a homeopathic medicine, as compared with a 3% improvement in patients given a placebo. (The result was significant at  $P = 0.0007$ .)

In the hay fever study, homeopathic doses of various flowers that are known to create pollen that initiates hay fever symptoms were used, and in the other studies, the researchers conducted conventional allergy testing to assess what substance each person was most allergic to. The researchers then prescribed the 30C (100-30) of this allergic substance (House dust mite 30C was the most commonly prescribed homeopathic medicine).

The researchers called this type of prescribing "homeopathic immunotherapy",<sup>(11)</sup> and they conclude from their research that either homeopathic medicines work or controlled clinical trials do not.

Technically, this research may be more precisely called "isopathy" because the medicines used were not the "similar" but the "same" ("iso") substance that was known to cause the specific symptoms of illness. However, the medicines were made in the typical homeopathic pharmacological process, and legally recognised homeopathic medicines were used in these trials.

In addition to this body of clinical evidence, an independent group of physicians and scientists evaluated clinical research prior to October, 1995

► (12). They reviewed 186 studies, 89 of which met their pre-defined criteria for their meta-analysis. They found that, on average, patients given a homeopathic medicine were 2.45 times more likely to have experienced a clinically beneficial effect. When reviewing only the highest quality studies and when adjusting for publication bias, the researchers found that subjects given a homeopathic medicine were still 1.86 times more likely to experience improved health as compared with those given a placebo. The researchers have also noted that it is extremely common in conventional medical research for more rigorous trials to yield less positive results than less rigorous trials.

The most important question that good scientists pose about clinical research (whether it deals with homeopathy or not) is: have there been replications of clinical studies by independent researchers?

Three separate bodies of researchers have conducted clinical trials in the use of a homeopathic medicine (Oscillocoquinum 200C) in the treatment of influenza-like syndromes (13-15). Each of these trials involved relatively large numbers of subjects (487, 300, and 372), and all were multi-centred placebo-controlled and double-blinded (two of the three trials were also randomised). Each of these trials showed statistically significant results.

One other body of research in the use of Galphimia glauca in the treatment of hay fever was replicated successfully seven times (16), but this research was conducted by the same group of researchers, and thus far, not by any others.

It would be inaccurate and biased to report only on studies that have shown positive results with homeopathic medicines. There are numerous clinical trials in which patients given a homeopathic medicine did not experience beneficial results. The meta-analysis described earlier verifies this, but it also suggests that the weight of evidence still suggests that homeopathy is more than just a placebo effect.



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### How does homeopathy work?

How homeopathic medicines work is presently a mystery. And yet, nature is replete with striking examples of the powerful effects of extremely small doses of active agents.

It is commonly known that certain species of moths can smell pheromones of their own species up to two miles away. Likewise, sharks are known to sense blood in water at large distances.

I stress again that nanopharmacological doses will not have any effect unless the person is hypersensitive to the specific medicinal substance. Hypersensitivity is created when there is some type of resonance between the medicine and the person. Because the system of homeopathy bases its selection of the medicine on its ability to cause in overdose the similar symptoms that the sick person is experiencing, homeopathy's "law of similars" as it is called, is simply a practical method of finding the substance to which a person is hypersensitive.

The homeopathic principle of similars makes further sense when one considers that physiologists and pathologists now recognise that disease is not

simply the result of breakdown or surrender of the body but that symptoms are instead representative of the body's efforts to fight infection or adapt to stress. Fever, inflammation, pain, discharge, and even high blood pressure are but a small number of the common symptoms that the organism creates in order to defend and to try to heal itself.

Over 200 years of experience by homeopathic physicians have found that a homeopathic medicine acts longer and deeper when it is more potentised. Although no one knows precisely why this happens, it is conjectured that highly potentised nanopharmacological doses can more deeply penetrate cells and the blood-brain barrier than less potentised medicines. Although there is no consensus on why these ultramolecular doses work more deeply, there is consensus from users of these natural medicines that they do.

One cannot help but sense the potential treasure-trove of knowledge that further research in homeopathy and nanopharmacology will bring.

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