

How Does Homeopathy Work



How does homeopathy work? Homeopathy is an over 200-year-old system of complementary and alternative medicine developed by the German physician-chemist Samuel Hahnemann. Hahnemann developed homeopathy as a way of doing no harm to his patients with a natural therapy that could stimulate innate healing in the body from acute or chronic conditions.

The controversies around homeopathy stem mainly from the way in which the medicines (also called remedies) are made from natural animal, mineral, and plant sources. The manufacturing process involves trituration (a manual method of grinding insoluble materials) in milk sugar (lactose) and then performing a process of serial dilutions. Some of the earliest preparation steps use dry dilutions in lactose with additional trituration (grinding or milling) steps.

Milling is a well-known method for breaking down bulk materials, including drugs, into smaller and smaller particles until they reach nanosize (1,2).

The ratios with which the dilutions are done are typically 1/10 (X series), 1/100 (C series), or 1/50,000 (LM or Q series).

At some point in the lower potency range, the serial dilution process is shifted to a liquid method in which a mixture of ethanol (alcohol) and water is used. After each dilution step, the mixture is agitated vigorously by pounding the container (typically made of glass) against a hard elastic

surface multiple times. The agitation steps are called succussions, which create intense shear forces in the solution and particle collisions as well as nanobubbles. In modern nanotechnology, this type of intense agitation involves vortexing or sonication. It creates and embeds nanoparticles into glass or polymer surfaces in contact with the solution (3).

Homeopathic Medicines are Nanostructures

Recent scientific studies have demonstrated that the manufacturing process creates **nanoparticles of the original source material** (4-10) and that the physical chemistry of the preparation method forces the nanoparticles to accumulate in a non-uniform way toward the top of the container after each dilution step (7). Nanoparticles can also adsorb (attach) to the walls of their container (3,11). Then the next "dilution" step ends up transferring nanoparticles from the previous step into the next container (7).

That is, although skeptics have long attacked homeopathy because of the molecular limits of Avogadro's number and the presumption that homeopathic medicines are too "dilute" to contain any active material, the scientific evidence is that homeopathic remedies are nanoparticles, not ordinary conventional bulk forms of source material. That fact changes the scientific issues completely from a debate over "placebo effects" to a serious scientific consideration of how nanoparticles can act in the body to stimulate healing processes (12,13).

In addition, succussions have repeatedly been shown in multiple research laboratories to release silica and silica precursors from the walls of the glass in which the succussions are performed (14,15). Plant extracts can make unique nanoparticles from silica precursors into plant-coated silica nanoparticles (16), or metal nanoparticles from metal precursors into plant-coated metal nanoparticles (17).

The silicates themselves can form specific nanostructures using templates in solution with it (18). Silica crystals and nanoparticles themselves are very active biologically and can amplify the effects of other substances or antigens with which they are administered (19). They form the basis of an emerging method of making more effective vaccines for oral delivery using less antigen (19,20). Silica can also imprint the structural information of other materials in solution with it, as it can self-assemble around templates such as plant constituents, proteins, DNA, cells, and viruses (18, 21).

Properties of Nanoparticles

Nanoparticles are very small forms of material, measuring 1-1000 nanometers in diameter along at least one side. The most interesting sizes of nanoparticles recognized by official research organizations are actually between 1-100 nanometers (22). Some homeopathic nanoparticles tend to be on the very small size range, perhaps around 15 nanometers or less (4,6). At small nanometer scale, because of the high surface area to volume ratio, nanoparticles acquire properties that the larger, bulk form of the "same" material do not possess.

These nanoparticle properties include the ability to adsorb other materials onto their surfaces (18), cross cell membranes without difficulty to enter cells, and act as highly catalytic and reactive agents in biological systems. Nanoparticles have biological, chemical, optical, thermal, electromagnetic, and quantum mechanical properties that larger particles do not (22). Nanomedicine forms have increased bioavailability, require lower doses to get the same effect, can have longer durations of action, and fewer side effects compared with ordinary conventional drugs, herbs, or vaccines (19,22).

Nanoparticles can initiate hormesis and adaptive changes in cells and organisms

Nanoparticles not only need lower doses to produce their

direct effects on biological systems, but some nanoparticles can also initiate a counter-action response, i.e., adaptive process, in the cell or organism known as **hormesis** (23). Hormesis is the ability of low doses to stimulate beneficial changes whereas higher doses of the same material can inhibit function or cause adverse effects. Hormesis depends upon the dynamical state of the recipient complex adaptive system at the time it encounters the treatment stimulus/stressor/agent.

Conventional drugs typically work in a higher dose range trying to just barely avoid toxicity (or not) and causing "side effects" while suppressing or inhibiting function to act at local tissues or cell receptors. Hormetic stimuli appear to act more as triggers for adaptive processes within the overall cell or whole organism to prepare for a future onslaught from a higher, more dangerous dose of the same or similar environmental threat (23,24). Some hormetic effects can be broader and more holistic in their scope than those of drugs. The result in hormesis is increased ability of the cell or organism to cope better, faster, and more effectively with future stressors or threats to survival as soon as they arise.

Another key question is the **nature of the signal or information** that the correct homeopathic medicine conveys to the recipient living organism or cell as a complex adaptive system. Saliency is essential; if the medicine is poorly matched to the individual symptom picture, no effect occurs. The data are converging on several different "signals" or information types: (i) *electromagnetic* (25-26); (ii) *optical or photon (light)-based* (27-28); (iii) *quantum mechanical entanglement and quantum coherence* (29-30). These are all types of signals or information that various forms of nanoparticles can generate (31). Of note, placebo-controlled empirical evidence indicates that people can just sniff individually salient homeopathic medicine and show changes in brain wave (EEG) responses (32-33). Olfaction is one sensory system that may engage quantum biology processes in detecting

specific information from environmental agents/odorants (34-35), even at levels hard to detect consciously.

Although skeptics choose to ignore all of the basic science, animal studies, and the positive clinical studies, the scientific evidence indicates that homeopathic medicines do exert measurable effects on living systems. Homeopathy was considered safe and likely effective in a comprehensive scientific review commissioned by the Swiss government (36).

Some studies are negative, a finding that is common to all types of clinical treatments including mainstream treatments. As with all systems of treatment, some placebo effects can also occur. Research has shown that the placebo effect size in controlled studies of homeopathic medicine is on average not unusually large or small – that is, the placebo effect size is what is expected for any therapeutic intervention (37).

Conclusions

Homeopathic medicine is one of the first systems of personalized medicine in which the individual's complete pattern of health problems leads to a precisely-targeted treatment choice. Homeopathic manufacturing is a crude form of "top-down" mechanical attrition methods for making nanoparticles. The fields of modern nanoscience and nanomedicines are relatively new, but it appears that Hahnemann was among the first to discover how to make nanoparticles from natural products and use them for medicinal purposes via hormetic dose levels (38). Conversely, modern nanoscientists are beginning to explore how extremely low concentrations of nanoparticles can still exert profound chemical catalytic effects as well as toxicity, even in the parts per billion range (39-40). That means that the cut-off for beneficial effects from low doses, i.e., hormesis, is even lower (13,41). Once set into motion, the organism or cell as a complex adaptive system, carries out a cascade of interrelated nonlinear dynamical changes in biology across the network

organization of the body or cell (42,43).

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