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## Fundamental Research in Homeopathy: Recent Developments and Physics Interfaces

Homeopathy is the second largest medical system practiced across the globe, and also amongst the most controversial therapeutic medical systems. The biggest controversy relates with the "Nature" of the ultra-high dilutions (UHDs). The UHDs are expected to devoid of "active therapeutic molecules"; termed simple dilution, and hence, compared with placebo. The modus operandi still remains a challenge for UHDs. But science in this area has gone beyond the boundaries of test tubes. An extensive research has been carried out to prove the plausibility of homeopathy.

Homeopathy has been questioned many a times regarding non-presence of active therapeutic molecules and dilution beyond Avogadro. An extensive research by Bellare et al (*Homeopathy* 2010, 2016; *Langmuir* 2012) verified the presence of silicate coated nano-structures dispersed in UHDs which might be responsible for biological actions of UHDs. Similar work by Upadhyay and Nayak (*Int J High Dilution Res* 2011), Bell IR, Schwartz GE (*Front Biosci* 2013) has also confirmed the presence of silicon-rich crystalline nanoparticles (NP) in UHDs. A work by Ghosh S and team (*Front Biosci* 2013) found that NPs of UHD of *cuprum metallicum* acted in a similar way to that of conventional copper NPs.

Potentization seems to be an irrational and mysterious procedure, difficult to explain by conventional physical theories, but research has scientifically validated its effect in preparation of UHDs. Studies by Jerman I (*Acupuncture and & Electro-therapeutic Research* 1999), Upadhyay and Nayak (*Int J High Dilution Res* 2011), Baumgartner S (*Int J High Dilution Res* 2014), Demangeat JL (*Homeopathy* 2015) etc. have verified the effect of potentization in the preparation of UHDs, and how these potencies differ from each other.

Another important and controversial aspect regarding modus operandi of homeopathy is water memory. It was put forth by Bernard (1965), developed and experimented by Benveniste, and remained in quotes for years, but has been questioned on its applicability and validity by many (Chaplin, Teixeira *Homeopathy* 2007). Apart from this, various models have been hypothesized for physicochemical nature of UHDs e.g. clathrates, dielectric dispersion, water molecular network, spectrum changes, therapeutically potent that have opened new frontiers.

Recent research has also shown that the specific remedial "information" is capable of being carried to biological system through UHDs (Klein SD, Wolf U, *Complement Ther Med* 2016; Sukul NC, *Int J High Dilution Res* 2012). Similarly, research also shows that UHDs can be differentiated from each other (Rao ML, Roy R, Bell IR, *Materials Letters* 2008; Lenger, *Cell Biochemistry and Biophysics*, March 2014; Sukul NC, *Int J High Dilution Res* 2015, 2016 etc.

There is also ample evidence that physicochemical properties of UHDs are different from their vehicle (solvent) and the research dates back to the early 70s when Yves were amongst the few researchers to use Nuclear Magnetic Resonance for differentiation amongst UHDs. Work by Rey L (*Physica* A 2003); Elia V, Niccoli M (*Journal of Thermal Analysis and Calorimetry* 2004); Roy R and team (*Materials Research Innovations* 2005); Anick DJ, Ives JA (*Homeopathy* 2007); Montainer L (*Interdiscip Sci.* 2009); Wolf U and team (*Evid Based Complement Alternat Med.* 2013) etc. are amongst the most quoted research in this field.

The research has moved from simple detection of "molecules" to quantum theory, and this exploration has been a challenging journey. Quantum theory is now the key area to explore the

physical existence of UHDs, in addition to their biological plausibility which has been repeatedly observed in clinical trials and in unconventional usages like in agronomy, veterinary, and dentistry. Biological action of UHDs in this area bypass the "placebo" tag.

But as research in homeopathy is in its emerging stage, we need more rigorous, multi centric research to safeguard it against skepticism and scientific assault. Research in high dilutions has its own specificities, strength, and weaknesses that must be systematically taken into account.

### **Studies to be Read**

Links to peer-reviewed studies published during July – Sep 2016

## **Fundamental Research**

### A morphometric and molecular study of the apoptosis observed on tadpoles' tail explants under the exposition of triiodothyronine in different homeopathic dilutions

Homeopathy 2016;105(3): 250-56.

There has been many hypothesis regarding the storage and transfer of therapeutic information in homeopathic dilution. The study was randomized, blind study in Anuran amphibian metamorphosis which is controlled by thyroid hormones (TH), including the resorption of the tadpole tail. Both controls and treated groups with T3 10ch showed no statistical difference. Thus the present experiment was in agreement with the hypothesis that T3, at a 10cH homeopathic dilution, changes the metamorphosis molecular network.

Link to study: <u>http://www.sciencedirect.com/science/article/pii/S1475491616300017</u>

# Homeopathic treatments modify inflammation but not behavioral response to influenza antigen challenge in BALB/c mice

Homeopathy 2016; 105(3): 257-64.

Viral infections including Influenza are worldwide nuisance for authorities. In this work, in search of new treatment options, influenza biotherapies (isotherapy) and Thymulin (endoisotherapy), were chosen to study the inflammatory and behavioral responses against influenza virus antigen in BALB/c mice. The results showed that both treatments induced subtle changes in acquired immune anti-viral response regulation. A deeper understanding of the mechanism could elucidate their possible use in influenza epidemiological situations.

Link to study: <u>http://www.sciencedirect.com/science/article/pii/S1475491616300029</u>

Vibrational and Raman spectroscopy provide further evidence in support of free OH groups and hydrogen bond strength underlying difference in two more drugs at ultra high dilutions

*Int J High Dilution Res.* 2016; 15(3): 2-10.

In previous issues, Sukul et al published two papers on Raman spectroscopic profiles of Sulphur, Natrum mur, Calcarea carb and Sepia. The authors observed that the free water molecules and hydrogen bond strength of OH groups are two unique features that differentiate a drug and even potency. The latest article in this issue is in continuation of the previous work. In this work

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authors studied the Raman spectra and FTIR profiles of three dilutions of X-ray and Magnetis poli ambo. The work seems interesting as these remedies are imponderabilia and do not have any molecular starting point, therefore, their mother tinctures, potencies, and vehicle are identical with respect to chemical composition, i.e. ethanol and water. This goes in contrast and comparison to previous works with organic and inorganic sources remedies.

The authors report that the electromagnetic and magnetic fields are capable of producing marked changes in water structure in water-ethanol solution. Such changes are mainly alteration in hydrogen bond strength and OH groups. The changes are induced by potentization and carried over to higher potencies, and cab be quantified using FTIR and Raman spectroscopic profiles.

Link to study: <u>http://www.feg.unesp.br/~ojs/index.php/ijhdr/article/view/826/832</u>

### A Fundamental Study to Observe Correlation at Molecular Level between Bio-Samples of Patients and Indicated Homoeopathic Medicines

*Int J High Dilution Res.* 2016; 15(3):11-17.

This paper by Mahata and Chattopadhyay, open up a new arena of experiments, challenge, and curiosity. The work aims to find out whether any similarity picture exists at the molecular level which may aid in the selection of medicines at the clinical level. In his previous works, Mahata has repeatedly shown the variation in frequency of ultrahigh dilutions (UHD) using dielectric dispersion concept. This paper goes a step ahead in finding the frequencies domain signatures of patient's bio-fluid (blood serum) and matching that with those of drug. But at present, this research is limited to matching profile in arthritis patients only. These results are explorative and enthusiastic but need further rigorous research before a generalization is extended to other conditions and setups.

Link to study: <u>http://www.feg.unesp.br/~ojs/index.php/ijhdr/article/view/818/833</u>

## Effects of homeopathic medicine on physical properties of matter - a classical and QED perspective

*Int J High Dilution Res.* 2016; 15(3):18-22.

This paper by Nandy et al discusses the physical properties of UHDs from classical and quantum electrodynamical point of view. The paper is based upon the previous works done by the author and her team on modulation of liposomal membrane fluidity, enhancement of efficiency of solar energy conversion and effect of homeopathic medicine on electroactive polymer.

Link to study: http://www.feg.unesp.br/~ojs/index.php/ijhdr/article/view/823/834

# The immunomodulatory effects of a commercial antiviral homeopathic compound in C57BL/6 mice, pre and post vaccine challenge.

Int Immunopharmacol. 2016 Oct;39:389-96.

This study deals with the action of Engystol®, an FDA-approved antiviral agent, in *in vivo* and *in vitro* observational studies, to evaluate the innate and adaptive immunomodulatory effects of oral Engystol(®) (1 or 10 tablets/L water consumed), prior to and post antigenic challenge in a mouse model with a well-characterized and clinically measureable immune system. Preliminary results showed that Engystol(®) alone did not alter immunity; however, upon vaccine challenge, Engystol(®) decreased CD4(+)/CD8(+) ratios, altered select cytokines/chemokines, and anti-H5N1 HA IgG titers were increased in the 10 tablet/L group. Collectively, these data suggest that Engystol(®) can modulate immunity upon antigenic challenge.

Link to study: <u>https://www.ncbi.nlm.nih.gov/pubmed/27551985</u>

# **Clinical Research**

#### **Homeopathic therapy in pediatric atopic diseases: short- and long-term results** *Homeopathy* 2016; 105(3): 217-24.

Atopic diseases in children are increasing the thus demand of their treatment has also sore high. This observational study reports the outcomes of atopic diseases in 325 children treated with homeopathy at the Homeopathic Clinic of Lucca (Italy) and related long-term results in 107 after approximately an 8-year period. The study also investigated the evolution of overall symptoms in those patients with a complex atopic symptomatology. The results reoports the efficacy of homeopathy in atopic children.

Link to study: <u>http://www.sciencedirect.com/science/article/pii/S1475491616000187</u>

**Protocol of randomized controlled trial of potentized estrogen in homeopathic treatment of chronic pelvic pain associated with endometriosis** *Homeopathy* 2016; 105(3): 240-49.

Link to study: http://www.sciencedirect.com/science/article/pii/S1475491616000199

Explanatory models for homeopathy: from the vital force to the current paradigm *Homeopathy.* 2016; 105(3): 280-85 In this study the authors discuss the model put forward by Hahnemann. Link to study: <u>http://www.sciencedirect.com/science/article/pii/S147549161600014X</u>

#### Re-analysis of survival data of cancer patients utilizing additive homeopathy.

*Complement Ther Med.* 2016 Aug;27:65-7. In this short communication the re-analysis of homeopathic patient data in comparison to control patient data from the same Outpatient's Unit "Homeopathy in malignant diseases" of the

Medical University of Vienna suggest that patients with advanced stages of cancer might benefit from additional homeopathic treatment until a survival time of up to 12 months after diagnosis. Link to study: <u>https://www.ncbi.nlm.nih.gov/pubmed/27515878</u>

## **Drug Standardization**

Preparation, standardization and in vitro safety testing of Mycobacterium nosodes (Emtact- polyvalent nosode)

Homeopathy 2016; 105(3): 225-32.

Nosodes hold a controversial topic from both practice and prescription point of view in homeopathy. For various Nosodes, the source and preparation remain a mystery. In the present study the authors have claim to develop a scientific and up to date method of preparation of Mycobacterium Nosodes, labeled as Emtact. Twenty billion viable cells for each strain were taken for Original Stock Nosode (OSN). Polymerase Chain Reaction (PCR) was performed for 30c potency for detection of any DNA material of the source organisms. The preparation by this method seems scientific and knowledgeable, but their therapeutic action still needs to be research rigorously. d

Link to study: <u>http://www.sciencedirect.com/science/article/pii/S1475491616000175</u>

## Survey

## Survey on hand gestures relevance in patient practitioner communication: a homeopathic example

#### Homeopathy 2016; 15(3): 233-39.

When it comes to homeopathy, symptoms, signs and observation holds the most important marks. The observation includes gestures also. The survey interviewed 94 homeopaths regarding the utilization and relevance of gestures in patients' symptom description. The result of the survey shows how homeopathic therapists view patients' hand gestures, whether they use these diagnostically and how this relates to their homeopathic practice.

Link to study: <u>http://www.sciencedirect.com/science/article/pii/S1475491616000163</u>

# Patients' preference for integrating homeopathy (PPIH) within the standard therapy settings in West Bengal, India: The part 1 (PPIH-1) study.

*J Tradit Complement Med.* 2015 Apr 10;6(3):237-46.

The objectives of this study is to examine the knowledge, attitudes, and practice of homeopathy among Indian patients already availing homeopathy treatment and its integration into mainstream healthcare. A cross-sectional survey was conducted among adult patients attending the out-patients of the four government homeopathic hospitals in West Bengal, India.

Link to study: <u>https://www.ncbi.nlm.nih.gov/pubmed/27419087</u>

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## Usage and Attitudes Towards Natural Remedies and Homeopathy in General Pediatrics: A Cross-Country Overview.

#### *Glob Pediatr Health.* 2016 Jul 1;3:2333794X15625409.

In order to better understand the global approach and country differences in physicians' usage, knowledge, and attitudes towards natural remedies and homeopathy in pediatric practice, an online survey involving 582 general pediatricians and general practitioners treating pediatric diseases was conducted in 6 countries. Overall, 17% of the pediatric prescriptions refer to phytotherapy and 15% refer to homeopathic preparations. Natural remedies and homeopathic preparations are more frequently used in upper respiratory tract infections, infant colic, sleep disturbances, and recurrent infections. In the majority of cases, they are used together with chemical drugs. Both treatment options are typically used if parents are concerned about side effects of conventional drugs or prefer natural remedies for themselves. Physicians express high interest in natural remedies and homeopathy; however, their knowledge is variable. Lack of proven efficacy, knowledge on mechanism of action, and information on indications are main factors that limit their usage.

Link to study: <a href="https://www.ncbi.nlm.nih.gov/pubmed/27493983">https://www.ncbi.nlm.nih.gov/pubmed/27493983</a>

## **Agro-Homeopathy**

#### First evidence of Beauvais' hypothesis in a plant model

#### Homeopathy 2016; 15(3): 270-79.

The primary aim of this double-blind randomized controlled experiment was to investigate whether there are differences of 'in situ randomization/unblinding' vs 'central randomization/unblinding' with respect to the effect of a homeopathic substance compared to placebo. In summary, we found a sulphur effect that is significantly different between 'in situ' and 'central' randomization/unblinding relating to all three stages of germination.

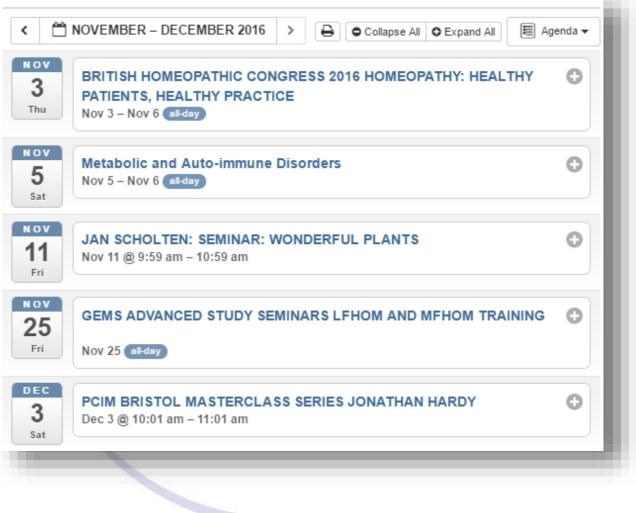
Link to study: http://www.sciencedirect.com/science/article/pii/S1475491616300212

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### **Upcoming Events**



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