**Selected by
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Latest Publications You Should Not Miss

Gard T, Taquet M, Dixit R, Hölzel BK, Montjoye Y-A, Brach N, Salat DH, Dickerson BC, Gray JR, Lazar SW: Fluid intelligence and brain functional organization in aging yoga and meditation practitioners. *Front Aging Neurosci* 2014;6:76.

Numerous studies have documented the normal age-related decline of neural structure, function, and cognitive performance. Preliminary evidence suggests that meditation may reduce decline in specific cognitive domains and in brain structure. Here we extended this research by investigating the relation between age and fluid intelligence and resting state brain functional network architecture using graph theory, in middle-aged yoga and meditation practitioners, and matched controls. Fluid intelligence declined slower in yoga practitioners and meditators combined than in controls. Resting state functional networks of yoga practitioners and meditators combined were more integrated and more resilient to damage than those of controls. Furthermore, mindfulness was positively correlated with fluid intelligence, resilience, and global network efficiency. These findings reveal the possibility to increase resilience and to slow the decline of fluid intelligence and brain functional architecture and suggest that mindfulness plays a mechanistic role in this preservation.

Sik dar S, Saha SK, Khuda-Bukhsh AR: Relative apoptosis-inducing potential of homeopathic condurango 6C and 30C in H460 lung cancer cells in vitro. *J Pharmacopuncture* 2014;17:059–069.

Objectives: In homeopathy, it is claimed that more homeopathically-diluted potencies render more protective/curative effects against any disease condition. Potentized forms of Condurango are used successfully to treat digestive problems, as well as esophageal and stomach cancers. However, the comparative efficacies of Condurango 6C and 30C, one diluted below and one above Avogadro's limit (lacking original drug molecule), respectively, have not been critically analyzed for their cell-killing

(apoptosis) efficacy against lung cancer cells in vitro, and signalling cascades have not been studied. Hence, the present study was undertaken.

Methods: 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assays were conducted on H460-non-small-cell lung cancer (NSCLC) cells by using a succussed ethyl alcohol vehicle (placebo) as a control. Studies on cellular morphology, cell cycle regulation, generation of reactive oxygen species (ROS), changes in mitochondrial membrane potential (MMP), and DNA-damage were made, and expressions of related signaling markers were studied. The observations were done in a 'blinded' manner.

Results: Both Condurango 6C and 30C induced apoptosis via cell cycle arrest at subG0/G1 and altered expressions of certain apoptotic markers significantly in H460 cells. The drugs induced oxidative stress through ROS elevation and MMP depolarization at 18–24 h. These events presumably activated a caspase-3-mediated signalling cascade, as evidenced by reverse transcriptase-polymerase chain reaction (RT-PCR), western blot and immunofluorescence studies at a late phase (48 h) in which cells were pushed towards apoptosis.

Conclusion: Condurango 30C had greater apoptotic effect than Condurango 6C as claimed in the homeopathic doctrine.

Khuda-Bukhsh AR: Current trends in high dilution research with particular reference to gene regulatory hypothesis. *Nucleus* 2014;57:3–17.

In homeopathy, ultra-low doses of drugs at ultra-high dilutions are often used with great benefits to patients although at such dilutions physical existence of even a single molecule of the original drug substance is highly improbable. Despite serious challenges thrown by scientists and rationalists from time to time, homeopathy has managed to survive over 200 years now, and is no more considered a myth. Research activities on homeopathy in recent years, at clinical, physical, chemical, biological and medical levels with acceptable scientific norms and approach have paved the way for more rigorous research, particularly at the molecular level to understand the physico-chemical nature and mechanism of action of ul-

tra-high dilutions. Although major breakthrough has been made in understanding many physical aspects and interactions between the 'drug' and 'aquatic ethanol' used as vehicle/solvent/diluents, certain aspects in regard to structure of water/aquatic ethanol and the latter's changing structural organization still remain unclear. In recent years, the quest for understanding the mechanism of biological action of the ultra-high dilutions has made homeopathy a hot bed of research. Much progress has been made in understanding the molecular mechanism in the light of the 'gene regulatory hypothesis' that can explain the action of the homeopathic high dilutions in all living organisms, both in higher and lower animals as well as in plants. The present review focuses mainly on research in support of the gene regulatory hypothesis, and mention has been made of some relevant physical and biological aspects at cellular and molecular levels.

Moral-Muñoz JA, Cobo MJ, Peis E, Arroyo-Morales M, Herrera-Viedma E: Analyzing the research in Integrative & Complementary Medicine by means of science mapping. Complement Ther Med 2014;22:409–418.

Objectives: The research in the Complementary and Alternative Medicine (CAM) field is analyzed according to the journals indexed in ISI Web of Science. Science Mapping Analysis (SMA) is used to provide an overview of the conceptual evolution of the CAM field.

Methods: The software SciMAT is used to detect and visualize the hidden themes and their evolution over a consecutive span of years. It combines SMA and performance analysis. Twenty one journals related to CAM were analyzed, in four consecutive periods from 1974 to 2011.

Results: Strategic diagrams and the thematic evolution of CAM, together with performance indicators (h-index), were obtained. The results show that CAM research has focused on seven main thematic areas: MEDICINAL-PLANTS, CHIROPRACTIC-AND-LOW-BACK-PAIN, ACUPUNCTURE-AND-PAIN, CELL-PROCESSES-AND-DISEASES, LIPID-PEROXIDATION and DIABETES-AND-INSULIN.

Conclusion: The research output could be used by the scientific community to identify thematic areas on which interest is focused.

Viksveen P, Dymitr Z, Simoens S: Economic evaluations of homeopathy: a review. Eur J Health Econ 2014;15:157–174.

Context: Economic evaluations of commonly used complementary and alternative medicine (CAM) therapies such as homeopathy are needed to contribute to the evidence base on which policy makers, clinicians, health-care payers, as well as patients base their health-care decisions in an era of constrained resources.

Objectives: To review and assess existing economic evaluations of homeopathy.

Methods: Literature search was made to retrieve relevant publications using AMED, the Cochrane Library, CRD (DARE, NHS EED, HTA), EMBASE, MEDLINE, and the journal Homeopathy (former *British Homeopathic Journal*). A hand search of relevant publications was carried out. Homeopathy researchers were contacted. Identified publications were independently assessed by two authors.

Results: Fifteen relevant articles reported on 14 economic evaluations of homeopathy. Thirteen studies reported numbers of patients: a total of 3,500 patients received homeopathic treatment (median 97, interquartile range 48–268), and 10 studies reported on control group participants (median 57, IQR 40–362). Eight out of 14 studies found improvements in pa-

tients' health together with cost savings. Four studies found that improvements in homeopathy patients were at least as good as in control group patients, at comparable costs. Two studies found improvements similar to conventional treatment, but at higher costs. Studies were highly heterogeneous and had several methodological weaknesses.

Conclusions: Although the identified evidence of the costs and potential benefits of homeopathy seemed promising, studies were highly heterogeneous and had several methodological weaknesses. It is therefore not possible to draw firm conclusions based on existing economic evaluations of homeopathy. Recommendations for future research are presented.

Zenner C, Herrnleben-Kurz S, Walach H: Mindfulness-based interventions in schools – a systematic review and meta-analysis. Front Psychol 2014;5:603.

Mindfulness programs for schools are popular. We systematically reviewed the evidence regarding the effects of school-based mindfulness interventions on psychological outcomes, using a comprehensive search strategy designed to locate both published and unpublished studies. Systematic searches in 12 databases were performed in August 2012. Further studies were identified via hand search and contact with experts. Two reviewers independently extracted the data, also selecting information about intervention programs (elements, structure etc.), feasibility, and acceptance. Twenty-four studies were identified, of which 13 were published. Nineteen studies used a controlled design. In total, 1,348 students were instructed in mindfulness, with 876 serving as controls, ranging from grade 1 to 12. Overall effect sizes were Hedge's $g = 0.40$ between groups and $g = 0.41$ within groups ($p < 0.0001$). Between group effect sizes for domains were: cognitive performance $g = 0.80$, stress $g = 0.39$, resilience $g = 0.36$, (all $p < 0.05$), emotional problems $g = 0.19$, third person ratings $g = 0.25$ (both n.s.). All in all, mindfulness-based interventions in children and youths hold promise, particularly in relation to improving cognitive performance and resilience to stress. However, the diversity of study samples, variety in implementation and exercises, and wide range of instruments used require a careful and differentiated examination of data. There is great heterogeneity, many studies are underpowered, and measuring effects of mindfulness in this setting is challenging. The field is nascent and recommendations will be provided as to how interventions and research of these interventions may proceed.

Chiu HY, Pan CH, Shyu YK, Han BC, Tsai PS: Effects of acupuncture on menopause-related symptoms and quality of life in women on natural menopause: a meta-analysis of randomized controlled trials. Menopause 2014;7:epub ahead of print.

Objective: This meta-analysis aims to evaluate the effects of acupuncture on hot flash frequency and severity, menopause-related symptoms, and quality of life in women in natural menopause.

Methods: We systematically searched PubMed/Medline, PsychINFO, Web of Science, Cochrane Central Register of Controlled Trials, and CINAHL using keywords such as acupuncture, hot flash, menopause-related symptoms, and quality of life. Heterogeneity, moderator analysis, publication bias, and risk of bias associated with the included studies were examined.

Results: Of 104 relevant studies, 12 studies with 869 participants met the inclusion criteria and were included in this study. We found that acupuncture significantly reduced the frequency ($g = -0.35$; 95% CI, -0.5 to

–0.21) and severity ($g = -0.44$; 95% CI, –0.65 to –0.23) of hot flashes. Acupuncture significantly decreased the psychological, somatic, and urogenital subscale scores on the Menopause Rating Scale ($g = -1.56$, $g = -1.39$, and $g = -0.82$, respectively; $P < 0.05$). Acupuncture improved the vasomotor subscale score on the Menopause-Specific Quality of Life questionnaire ($g = -0.46$; 95% CI, –0.9 to –0.02). Long-term effects (up to 3 mo) on hot flash frequency and severity ($g = -0.53$ and $g = -0.55$, respectively) were found.

Conclusions: This meta-analysis confirms that acupuncture improves hot flash frequency and severity, menopause-related symptoms, and quality of life (in the vasomotor domain) in women experiencing natural menopause.

Ko JH, Feigin A, Mattis PJ, Tang CC, Ma Y, Dhawan V, During MJ, Kaplitt MG, Eidelberg D: Network modulation following sham surgery in Parkinson's disease. J Clin Invest 2014;124:3656–3666.

Patient responses to placebo and sham effects are a major obstacle to the development of therapies for brain disorders, including Parkinson's disease (PD). Here, we used functional brain imaging and network analysis to study the circuitry underlying placebo effects in PD subjects randomized to sham surgery as part of a double-blind gene therapy trial. Metabolic imaging was performed prior to randomization, then again at 6 and 12 months after sham surgery. In this cohort, the sham response was associated with the expression of a distinct cerebello-limbic circuit. The expression of this network increased consistently in patients blinded to treatment and correlated with independent clinical ratings. Once patients were unblinded, network expression declined toward baseline levels. Analogous network alterations were not seen with open-label levodopa treatment or during disease progression. Furthermore, sham outcomes in blinded patients correlated with baseline network expression, suggesting the potential use of this quantitative measure to identify 'sham-susceptible' subjects before randomization. Indeed, Monte Carlo simulations revealed that a priori exclusion of such individuals substantially lowers the number of randomized participants needed to demonstrate treatment efficacy. Individualized subject selection based on a predetermined network criterion may therefore limit the need for sham interventions in future clinical trials.

Beauvais F: Description of Benveniste's experiments using quantum-like probabilities. JSE 2013;27:43–71.

Benveniste's experiments (also known as 'memory of water' or 'digital biology' experiments) remain unresolved. In some research areas, which have in common the description of cognition mechanisms and information processing, quantum-like statistical models have been proposed to address problems that were 'paradoxical' in a classical frame. Therefore, the outcomes of the cognitive state of the experimenter were calculated for a series of Benveniste's experiments using a quantum-like statistical model (i.e. a model inspired by quantum physics and taking into consideration superposition of quantum states, non-commutable observables, and contextuality). Not only were the probabilities of 'success' and 'failure' of the experiments modeled according to their context, but the emergence of a signal from background was also taken into account. For the first time, a formal framework devoid of any reference to 'memory of water' or 'digital biology' describes all the characteristics of these disputed results. In particular, the difficulties encountered by Benveniste (reproducibility of the experiments, disturbances after blinding) are simply explained in this model without additional ad hoc hypotheses. It is thus proposed that we see Benveniste's experiments as the result of quantum-like probability interferences of cognitive states.

Beauvais F: 'Memory of water' without water: the logic of disputed experiments. Axiomathes 2014;24:275–290.

The 'memory of water' was a major international controversy that remains unresolved. Taken seriously or not, this hypothesis leads to logical contradictions in both cases. Indeed, if this hypothesis is held as wrong, then we have to explain how a physiological signal emerged from the background and we have to elucidate a bulk of coherent results. If this hypothesis is held as true, we must explain why these experiments were difficult to reproduce by other teams and why some blind experiments were so disturbing for the expected outcomes. In this article, a third way is proposed by modeling these experiments in a quantum-like probabilistic model. It is interesting to note that this model does not need the hypothesis of the 'memory of water' and, nevertheless, all the features of Benveniste's experiments are taken into account (emergence of a signal from the background, difficulties faced by other teams in terms of reproducibility, disturbances during blind experiments, and apparent 'jumps of activity' between samples). In conclusion, it is proposed that the cognitive states of the experimenter exhibited quantum-like properties during Benveniste's experiments.