

# DAY 1 – 5 June 2015

930-1030 Homeopathy research – the state of play and the way forward

930-1030 順勢療法的研究 -戲劇的局勢和前進的方向



**Prof Paolo Bellavite \*\*\*, Italy. Basic research on homeopathic principles**

**Prof Paolo Bellavite \*\*\*, 來自意大利. 順勢療法原則的基礎研究**

<p>Background 背景</p>	<p>Professor of General Pathology, School of Medicine, Verona University, Italy 意大利維羅納大學醫學院病理學教授</p> <p>Prof. Bellavite is a teacher and researcher specialising in Clinical and Laboratory Haematology. His research focuses on molecular and cellular aspects of inflammation, with particular regard to the structure, biochemistry and function (normal and pathological) of granulocytes, macrophages and platelets. Bellavite 教授是一位教師及研究人員，專科臨床及實驗室血液學。他的研究主要集中在炎症的分子和細胞方面，特別是有關粒細胞，巨噬細胞和血小板的結構、生物化學和功能（正常和病理）。</p>
<p>Research area 研究範圍</p>	<p><i>Bellavite P, Signorini A, Marzotto M, Moratti E, Bonafini C, Olioso D. Cell sensitivity, non-linearity and inverse effects. Homeopathy. 2015 Apr;104(2):139-160. doi: 10.1016/j.homp.2015.02.002. Epub 2015 Mar 12. Review.</i> <i>細胞的敏感性，非線性和逆效應</i></p> <p>It has been claimed that the homeopathic principle of 'similarity' (or 'similia') and the use of individualized remedies in extremely low doses conflicts with scientific laws, but this opinion can be disputed on the basis of recent scientific advances. Several mechanisms to explain the responsiveness of cells to ultra-low doses and the similarity as inversion of drug effects, have again been suggested in the framework of hormesis and modern paradoxical pharmacology. 有人聲稱，順勢療法的「相似」法則，和使用極低劑量個人化的單一療劑，不符合科學規律，但這論點在近年科學進步的基礎上已存在爭議。有幾種機制可以解釋超低劑量和相似療劑對細胞的逆藥物效果，它們再次建基於「毒物興奮效應」和「現代反常藥理學」的框架上。</p> <p>Low doses or high dilutions of a drug interact only with the enhanced sensitivities of regulatory systems, functioning as minute harmful stimuli to trigger specific compensatory healing reactions. Here we review hypotheses</p>

	<p>about homeopathic drug action at cellular and molecular levels, and present a new conceptual model of the principle of similarity based on allosteric drug action.</p> <p>低劑量或高度稀釋的藥物，以極小侵害性的刺激作用模式去觸發特定的代償修復反應，僅與具較強敏感性的調節系統中起交互作用。在這裡，我們審視了順勢療法療劑作用，於細胞和分子層面的假說，並根據異位效應藥物作用，展示出「相似」法則的全新概念模式。</p> <p>While many common drugs act through orthostatic chemical interactions aimed at blocking undesired activities of enzymes or receptors, allosteric interactions are associated with dynamic conformational changes and functional transitions in target proteins, which enhance or inhibit specific cellular actions in normal or disease states. The concept of allostery and the way it controls physiological activities can be broadened to include diluted/dynamized compounds, and may constitute a working hypothesis for the study of molecular mechanisms underlying the inversion of drug effects.</p> <p>許多常用藥物都通過體位性化學相互作用，以阻止酵素或受體的不必要活動，異位相互作用則跟目標蛋白質之動態結構和功能轉換有關，在正常或患病狀態中，可增強或抑制某些指定的細胞行為。變構的概念和它控制生理活動的途徑，可以擴大至包括被稀釋/加能的化合物，並可能成為逆藥物作用之分子機制研究的有效假設。</p>
	<p><i>Bellavite P, Marzotto M, Olioso D, Moratti E, Conforti A. High-dilution effects revisited. 1. Physicochemical aspects. Homeopathy. 2014 Jan;103(1):4-21. doi: 10.1016/j.homp.2013.08.003. Review.</i> <i>重新審視高稀釋效應 1---- 物理化學方面</i></p> <p>Several lines of evidence suggest that homeopathic high dilutions (HDs) can effectively have a pharmacological action, and so cannot be considered merely placebos. However, until now there has been no unified explanation for these observations within the dominant paradigm of the dose–response effect. Here the possible scenarios for the physicochemical nature of HDs are reviewed. A number of theoretical and experimental approaches, including quantum physics, conductometric and spectroscopic measurements, thermoluminescence, and model simulations investigated the peculiar features of diluted/succussed solutions.</p> <p>一些證據表明，順勢療法高度稀釋液（HDS）能夠有效地具有藥理作用，所以不能僅僅被認為是安慰劑。然而，到現在仍沒有統一解釋，去說明「劑量與效應關係」突出範例中的這些觀察。順勢療法高度稀釋液可能出現於物理化學的情況，正被進行審查。許多理論和實驗方向，包括量子物理學、電導和光譜測量、熱釋光，和模擬模型，都在探討稀釋/加能液體的獨特特徵。</p> <p>The heterogeneous composition of water could be affected by interactive phenomena such as coherence, epitaxy and formation of colloidal nanobubbles containing gaseous inclusions of oxygen, nitrogen, carbon dioxide, silica and, possibly, the original material of the remedy. It is likely that the molecules of</p>

	<p>active substance act as nucleation centres, amplifying the formation of supramolecular structures and imparting order to the solvent.</p> <p>水的多相結構，可能會受到一些互動現象所影響，例如是膠體納米氣泡的形成、凝聚力和取向附生性，膠體納米氣泡內包括混和有氧、氮、二氧化碳、二氧化矽及可能是藥劑原有物質的氣態夾雜物。活性物質分子很可能會充當成核中心，擴增超分子結構的形成，賦予溶劑秩序。</p> <p>Three major models for how this happens are currently being investigated: the water clusters or clathrates, the coherent domains postulated by quantum electrodynamics, and the formation of nanoparticles from the original solute plus solvent components.</p> <p>目前正在研究引致這種情況發生的三個主要模式：包括水簇或水的籠形物、量子電動力假設的凝聚域(coherent domains)、以及從原來的物質加溶劑組分形成的納米顆粒。</p> <p>Other theoretical approaches based on quantum entanglement and on fractal-type self-organization of water clusters are more speculative and hypothetical. The problem of the physicochemical nature of HDs is still far from to be clarified but current evidence strongly supports the notion that the structuring of water and its solutes at the nanoscale can play a key role.</p> <p>基於量子糾纏和水簇的分型自我組織的其他理論方法，則比較不確定及假設性。在於順勢療法高度稀釋液的物理化學性質方面的問題，暫時仍然未完全釐清，但目前已有證據強烈支持水結構、以及其納米級別的溶質可以發揮關鍵作用的概念。</p>
	<p><i>Bellavite P, Marzotto M, Olioso D, Moratti E, Conforti A. High-dilution effects revisited. 2. Pharmacodynamic mechanisms. Homeopathy. 2014 Jan;103(1):22-43. doi: 10.1016/j.homp.2013.08.002. Review.</i></p> <p><i>重新審視高稀釋效應 2----藥效學機制</i></p> <p>The pharmacodynamics aspects of homeopathic remedies are appraised by laboratory studies on the biological effects at various levels (cellular, molecular and systemic). The major question is how these medicines may work in the body. The possible answers concern the identification of biological targets, the means of drug–receptor interactions, the mechanisms of signal transmission and amplification, and the models of inversion of effects according to the traditional ‘simile’ rule.</p> <p>順勢療法藥劑的藥效學方面，由實驗室中各個生物效應層面的研究（包括細胞、分子和系統）作評估。主要的問題，在於順勢療法藥劑在人體內如何運作。可能的答案涉及目標生物的鑑定、藥物與受體之間相互作用的途徑、信號傳輸及增強的機制、以及據傳統「相似」法則影響的逆藥物作用。</p> <p>These problems are handled by two experimental and theoretical lines, according to the doses or dilutions considered (low-medium versus high dilutions).</p>

根據其劑量或稀釋度（低介質對比於高稀釋度），這些問題可以按照兩個實驗和理論方向作處理。

Homeopathic formulations in low-medium dilutions, containing molecules in the range of ultra-low doses, exploit the extreme sensitivity of biological systems to exogenous and endogenous signals. Their effects are interpreted in the framework of hormesis theories and paradoxical pharmacology.

低至中稀釋度的順勢療法劑中，含有超低劑量範圍內的分子，可以利用生物系統對外感和內生信號的極端敏感性。其效果形式上能夠以「毒物興奮效應」的理論和「反常藥理學」作解釋。

The hypotheses regarding the action mechanisms of highly diluted/dynamized solutions (beyond Avogadro–Loschmidt limit) variously invoke sensitivity to bioelectromagnetic information, participation of water chains in signalling, and regulation of bifurcation points of systemic networks. High-dilution pharmacology is emerging as a pioneering subject in the domain of nanomedicine and is providing greater plausibility to the puzzling claims of homeopathy.

關於高度被稀釋/加能的液體（超越阿伏加德羅常數之外）作用機制的假設，各種不同的描述會援引生物電磁信息的敏感度、和水份子鏈於「信息交換」以及「生物系統分岔點調節」的參與。高稀釋藥理學正是納米醫學領域的先驅主題，並為順勢療法令人費解的疑團提供了更大的合理性。