

Biological evidence for an effect of high homeopathic potencies using biomolecular tools PhD Etienne Capieaux (B)

Our own experiments, as others recently published, make it clear that a homeopathic medicine is able to influence the expression profile of particular genes of cells when they are in contact with the remedy. Each medicine has its own genes targets. A beam of obvious scientific facts suggests that one of the modes of action of homeopathic medicines, at genetic level, is of epigenetic nature. Etymologically, epi-genetic means 'above' the gene, not 'in' the gene. As such the remedy does not change the linear gene sequence's as a mutagenic medicine would do. An epigenetic mode of action does not alter the nature of the gene, only its expression. Just like the cursor of an amplifier of a hi-fi system allows to increase or to decrease the sound, a homeopathic medicine is able to increase or decrease the targeted gene expression. Each homeopathic remedy is assigned to targeted genes but the orientation and the power of the modulation depends of the potentization level. The revolution for the homeopathic domain is that this biological action, also for the highest dilutions/dynamizations, is now identifiable by molecular biology technologies such as PCR (also used in criminology), Micro-arrays and heterologous expression. These 3 tools, applied for 3 groups of homeopathic stocks are presented today during 3 separated presentations. Such epigenetic regulations are observed for both simple molecular stocks (Cuprum) as for a complex molecular mix (root of Gelsemium). Be careful not to confuse, when the unicist homeopath prescribes Gelsemium, it is indeed one single remedy but containing at the origin all roots molecules. It is a really complex mix where each molecular element could have an impact on the genome.

With Cuprum and Gelsemium, we have two representative members of these two different stock families. Well, it is a good thing, because they are also the research topics of this colloquium. What do we know about epigenetic and these both remedies?

GELSEMIUM Major steps forward were published by the university team of Verona directed by Professor Paolo Bellavite. This team established by Micro-arrays the extreme sensitivity to this Gelsemium stock of 56 genes expressed in human neurocytes. Among them genes implicated in calcium homeostasis, G-protein coupled receptor signaling pathways, inflammatory response and neuropeptide receptors. This has been verified for a range of potentizations (2C,3C,4C,5C,9C and 30C) for this medicine.

CUPRUM Several teams of the university of Florence (Pharmacologic and chemistry department among others) have published Micro-arrays results showing a modification of the gene expression profile in a human prostate epithelial cell line after exposition to extremely low copper concentration (from 10^{-6} to 10^{-17} Mol/l). A set of genes belonging to different gene families were modulated by copper, precisely the families of the heat shock proteins and metallothioneins. At all concentrations tested, some genes were modulated in a dose-dependent way, while the others in a dose-independent way. Another kind of molecular biology analysis (RT-PCR), performed on four different genes on five biological replicates for selected genes, on each copper concentration tested confirms the observations emerging from the Micro-arrays experiences.

CONCLUSION The efficacy of a homeopathic medicine can be highlighted using various approaches. The advanced technologies of molecular biology are opening new ways to explore the impact of "informational" medicine prepared homeopathically. Even if more studies are always justified and needed, the already published results by different teams in the world no longer allow to deny an effect of high potentized homeopathic medicines and in particular homeopathic remedies are influencing the biological activity of human cells "in vitro" and "in vivo".

Changes in gene expression induced by high homeopathic potencies of short nucleic acid fragments PhD Etienne Capieaux (B)

Homeopathy considers human being as a global, mind and physical, entity. Mankind is closely connected with the global universe. Homeopathy is connected with LIFE in all its components. Rhythm is part of all living systems and an important pillar of the pharmaceutical manufacturing of high potentizations. It is thus important to assist basic physicochemical researches by investigations starting of LIVING systems, human, animal or vegetal as examples. New and unique experimental data's are presented at this colloquium, a window on new horizons. As example, we have studied the impact of high potentization on baker's yeast. It is an LIVING eukaryotic unicellular organism worldwide used for scientific research. It is genetically and biochemically very close of human cells. We can see a yeast gene answer to the contact with homeopathic stocks and this in a reproducible manner. The gene response is identified by the appearance of a color quantified by measuring its specific absorbance. Here again an experimental design derived from extensively published classical scientific research. The uniqueness of the presented data at this

colloquium is that this model totally fit for the investigation of informational and potentized homeopathic medicines. The presented experimental data reveal the existence of peculiar yeast genetic areas influencing the tested gene expression. Clearly, the gene expression could be controlled by subtle information's carried by precise DNA sequences. The homeopathic medicine modulates the information carried on these sequences. Advanced technologies of molecular biology offer new tools to study the effect of a homeopathic medicine on biologic systems. For Cuprum and Gelsemium, we explained this morning how the Micro-arrays technologies and PCR could help us to understand the impact of these remedies on our genes. Using the yeast model, we are at the level of the heterologous gene expression and the impact on reporter's genes. The information about gene expression is reported through response intensity, a color in this specific case. This molecular biology tool, designed for classical experimental studies on high dosed conventional medicines, lend itself remarkably also in homeopathic medicines allowing to objectivize their activities. The common point of these diverse experimental approaches is the study on gene expression or gene behavior after contact with high potentized homeopathic medicine.

The actual bibliographic state-of-the-art demonstrates firmly this new direction.

1. Yes, there is an interaction between the homeopathic medicine and the subject genome when contact is established.
2. Yes, a biologic activity can be started within a LIVING being by a homeopathic medicine.
3. The experimental results presented today on the unicellular yeast is a prove that this biological activity is not a placebo effect.

The high-speed train (TGV) « Homeopathy » run on new scientific rails towards new destinations PhD Etienne Capieaux (B)

Using molecular biology objectifiable methods we have to conclude that: there is an interaction between a homeopathic medicine and patient's genome. This interactivity includes epigenetics. Indeed, these molecular biology methods, daily used in university centers and hospitals, showed that a homeopathic medicine is able to increase or decrease human gene expression. As such it modifies the (human or animal) physiology of the receiver. These "in vitro" or "in vivo" experimental observations confirm that a high potentized homeopathic remedy is a medicine, in its classical and noble sense, because it generates a biological activity in the body. Furthermore, the results with "in vitro" unicellular model (*Saccharomyces cerevisiae* – baker's yeast), presented during this colloquium, excludes a simple placebo effect. Under the impulse of these new technologies, earlier exclusively used for allopathic medicines, homeopathy comes again on new high-speed scientific rails, as a TGV.

It opens new horizons for compelling investigations on its mode of action and many open questions. We can consider 6 research pillars:

1. Better understanding of implemented biological pathways (biochemical waterfalls) at the intake of a homeopathic medicine.
2. Better understanding of the "power" (biologic impact) on living systems when the potentization (dilution/dynamization) level increases.
3. Better understanding of the individualization principle of a homeopathic medicine.
4. Better understanding of the nature of the physicochemical transmitters of the homeopathic information to the genome. The implication of the nuclei-backbone and the tridimensional structure of the transcription promotion areas is a solid hypothesis.
5. A new definition of the homeopathic proving concept (on healthy volunteers) through the identification of the concerned genes after intake of a questioned homeopathic medicine in different potentization's. We could call them Homeopathic genetic provings. It could assist the prescribers beside classical provings results (corroboration).
6. Better understanding of the resonance areas of the genome when the homeopathic information has been received at a specific gene, modulation of the gene expression under control of this area.

This second DYNHOM colloquium delivered several responses to the question of the nature of the homeopathic medicines (signature).

- Using the most advanced technologies, there is a complete coherence between all measurements on homeopathic medicines (HPLC-UV; NTA; SEM-EDS; RMN; AEP ...).
- A dynamized dilution is not a simple dilution.
- A step by step dilution is not a common dilution and the Avogadro number cannot be applied to this manufacturing method.

- The "K" manufacturing process is not comparable to the "CH" manufacturing method.
- Discrimination between homeopathic potentizations of two different medicines is possible even in highest dilutions.
- Tools commonly used in Molecular Biology can be applied to homeopathic remedies and a specific effect is demonstrable.
- Quantic Physic of fluids is able to explain all these facts.
- The homeopathic medicine is more than a placebo preparation.
- The use of homeopathic medicines is justified by an appropriated EBM level.
- The efficiency of homeopathy in general practice is at least comparable to the conventional approach avoiding iatrogenic secondary effects.
- Homeopathy used as complementary approach of patient's complaints is ethically justified.