

Different concentrations of ethanol, variations in pH, temperature, and glassware, as well as dilution sampling and succussions (or sonication, vortexing) will lead to different sizes, shapes, surface charges, and properties of the resultant nanostructures. Even minor variations in the latter variables could contribute variability to remedy actions.

This talk discusses implications of the homeopathic nanoparticulate findings for a biological signaling model of the homeopathic remedy nanostructures in initiating a cascade of endogenously amplified adaptations and cross-adaptations across the organism as a whole.

Homeopathic remedy manufacturing probably generates NPs by a crude “top-down” mechanical grinding in lactose and/or succussions in room temperature ethanolic solutions within borosilicate glass containers. Silica nanostructures could serve as remedy source NP drug delivery vehicles and nonspecific biological amplifiers. Nanoparticles induce self-organized adaptive changes in the organism at nontoxic doses (hormesis), serving as salient, low level danger signals to the biological stress response networks. Release of exosomes and activation of stress response effectors, including heat shock proteins, inflammasomes, cytokines and neuroendocrine networks, would initiate and progressively amplify beneficial compensatory reactions. Thus, homeopathy may represent the earliest practical development of “integrative nanomedicine” for using pulsed doses of nanoparticles from natural source materials safely and effectively in treating a wide range of acute and chronic clinical conditions.

## Modulation of chronic inflammation response to *Leishmania (L.) amazonensis* by Thymulin 5CH in mice

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In previous studies, we observed that thymulin 5CH could modulate the chronic inflammation response to BCG in an experimental infection, by increasing peritoneal B1 stem cells differentiation into phagocytes and improving bacilli phagocytosis efficiency into the infection site. Herein, the same protocol was used to study the effects of thymulin 5CH in a protozoan experimental infection. Male Balb/c mice were orally treated with thymulin 5CH or vehicle during 60 days after the subcutaneous inoculation of  $2 \times 10^5$  units of *Leishmania (L.) amazonensis* into the footpad. Then, washing inflammatory cell suspension

from peritoneal cavity and spleen were harvested to be identified and quantified by flow cytometry and the tissue of infection site, as well as the local lymph node were harvested for histological examination and quantification. Treated mice presented increase in B1 stem cells percentage in peritoneal washing fluid and in spleen ( $p=0.0001$ ), in relation to other cell types, and more organized and exuberant inflammation response in the infection site, with decrease in the number of parasites per field ( $p=0.05$ ). No difference was seen in local lymph node histology. The results show that thymulin 5CH is able to improve B1 stem cell activation and *Leishmania (L.) amazonensis* phagocytosis efficiency in mice, similarly to that observed previously in BCG experimental infection.

## Homeoprophylaxis: evidence from basic research and practical applications

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Homeo-Prophylaxis (HP), has been one of the more questioned application of homeopathy despite it also could be considered one of the most revolutionary uses in terms of benefits for health quality. Although the protection effects and impact (effectiveness and efficacy) are frequently difficult to demonstrate, the lack of scientific research, among other factors, hinder the acceptance and implementation of HP but also limits the possibility of running proper clinical studies. In order to breakdown this close circle, in vitro experiment, animal's models and clinical evaluation should be combined with the current knowledge and evaluation methodologies of the immune system.

A summary of unpublished results from basic research experiments on the effects of homoeopathically diluted biological material as prophylactic formulations on in vitro and animal models will be presented. According to the results, an approach to underlying immune mechanisms could be proposed and discussed.

Results from 5 years follow up of large scale Leptospirosis HP intervention will be complemented and analysed. Further clinical evaluation of HP on other epidemic diseases at large scale could be presented.

A integral analysis of evidence coming from experimental model and clinical testing suggest that HP could be consider in fact as a very promising and potent tool to face infectious diseases in the context of current global situation.