

EDITORIAL

Zincum metallicum research: an international scientific collaboration in homeopathy



The discovery of the mechanisms and the particularities involving homeopathy is like a huge puzzle. At first, finding some pieces that fit together is an almost Herculean task. Sceptics say that it is impossible to assemble a puzzle of that size. But, as the most patient players do, we can find some solutions and gradually form a sharp image, so the challenge becomes more and more interesting, attracting new participants who are also willing to play. And so with homeopathy.

The participation of researchers from different universities and countries, each working on a particular aspect, and the interaction among them that took place at attractive scientific meetings arranged by organisations such as GIRI (International Research Group on Very Low Dose and High Dilution Effects) and HRI (Homeopathy Research Institute), has contributed importantly to progress. Working collaboratively as groups, more than ever, has been critical.

It was with this vision that we have organized, since 2012, a multicentre project on the homeopathic medicine *Zincum metallicum*, which included the participation of six different universities and researchers from Brazil and Italy. The contribution of this initiative has been to describe a wide range of physical and biological features of a certain homeopathic medicine and to create a robust scientific basis for its clinical indications.

The work on *Zincum metallicum* included studies on the historical aspects of its materia medica, its actions on cell activity *in vitro* and *in vivo*, as well as its physicochemical properties. To compare the results consistently, all participants used drugs obtained from the same batch, manufactured in the School of Pharmacy of the Federal University of Rio de Janeiro. The results were the subject of discussions at recent GIRI meetings, enabling a broad perspective on the findings overall. Other results from the collaboration, including those from plant or animal models, are published elsewhere (<http://www.highdilution.org/index.php/ijhdr/issue/archive>). This special issue of *Homeopathy*, which spans its current and its previous quarterly publication, presents the results from this research initiative that relate to materia medica, the biological activity *in vitro* and the physical properties of the medicine.

The historical review tackled the experimental basis for the clinical indications for *Zincum metallicum*, showing that knowledge about this remedy had accumulated since the nineteenth century, with new information from clinical

observations added to its materia medica over the subsequent years.¹ A list of the main symptoms and the description of illustrative cases were presented, clarifying the profile of *Zincum metallicum* and its indications.

The search for ideal experimental models to study high dilutions is still an unsolved question. Over the past decades, researchers have begun to realize that the effects of high dilutions can often be studied at the cellular and molecular levels, instead of necessarily in whole living organisms. The reduction to a cell microenvironment *in vitro* may focus on the core of homeopathic information processing by a living system.

In this special issue, two *in-vitro* studies are reported. The first article, contributed by the team in Verona, showed the effects of a wide range of zinc concentrations on macrophage and astrocyte cultures.² A biphasic effect was seen on IL10 production by macrophages, increasing or reducing it after cell exposure to different homeopathic dilutions of zinc. On the other hand, the toxicity of zinc in higher concentrations seems to be related to previous TNF-alpha production by the cells. In both cases, the non-linearity of the effects was clear, highlighting an important feature of the biological action of homeopathic preparations. The second study, undertaken by the Curitiba team using macrophages and melanoma cells, reveals that the 'one size fits all' model of conventional drug screening on cell monoculture does not fit for homeopathy studies.³ It seems rather that *in-vitro* research in homeopathy needs be designed according to the clinical features and activity of the medicine. This exciting observation may prompt young researchers to start working in the high-dilution domain. Important to note is that in both studies a series of negative results was also presented: this is another point to be stressed, for it reflects the impartiality of the entire project and is an important example to new researchers.

As an insoluble solid, *Zincum metallicum* must be ground with lactose as the first steps of medicine preparation, according to the main pharmacopoeias of the world. The group based in Rio de Janeiro performed a series of experiments to elucidate the effect of this zinc trituration process, with associated dynamization, on physicochemical properties of lactose-based homeopathic preparations. Thus, the samples were analysed both structurally and thermally: amorphous and crystalline lactose spheres were identified in *Zincum metallicum* up to 3c dilution, and the trituration/dynamization process modified the temperature range of water aggregation.⁴ This is the first detailed study in the literature that elucidates physical properties of a

homeopathic medicine in its early stages of preparation, as used for insoluble substances. Moreover, previous results about innovative methods of *Zincum metallicum* quality control were published in Ref. 5.

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Leoni V Bonamin*

Universidade Paulista – UNIP, São Paulo, Brazil

Paolo Bellavite

Università degli studi di Verona, Verona, Italy

*Correspondence: Leoni V Bonamin, Universidade Paulista, Rua Dr Bacelar, 1212 – 4th Floor, cep 04026-002, São Paulo, Brazil.

E-mail: leonibonamin@gmail.com, leonibonamin@unip.br