



## Nanotechnolglical Investigations in to Ayurvedic Rasa-Shastra based medicines - Special reference to *Mahayogaraj guggulu*

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Ayurveda is the science made up of Ayush (life) and Veda (knowledge), leading to knowledge of life. It is common knowledge that in Indian subcontinent since 7th century A.D., ayurvedic system adopted a holistic approach towards health care by balancing the physical, mental and spiritual functions of the human body. Rasa-Shastra (vedic-chemistry) is one of the mainstay of Ayurveda, which deals with herbo-mineral/metals/non-metals preparations called Bhasmas. The Bhasmas have been accepted in Indian system since ages through Ayurveda or Siddha system of medicine. Bhasmas or such preparations are extremely fine powders coated with herbal extracts. Such herbo-mineral preparations are known to contain traces of toxic metals like sulphur, mercury and lead too. Presence of such toxic metals draws attention of research community towards understanding their toxicological, therapeutic and physiological effects so that safest medicines using modern analytical tools can be presented for the public health. Analytical standardization assures that the products are true beyond any doubt in respect of quality, efficacy, performance, and safety. One such ayurvedic formulation; *Mahayogaraj guggulu* is one which is

reported to contain an unacceptably huge metallic content, yet has been in use in Ayurveda for the treatment of various neurological disorders – apart from various herbs added for preparation of *Mahayogaraj guggulu*, following metals are added – Tin in Vanga Bhasma, Silver in Rajat Bhasma, Lead in Naga Bhasma, Iron in Loha Bhasma, Mica in Abhraka Bhasma, Iron oxide in Mandura Bhasma and Mercuric sulfide in Rasa Sindura. The high levels of metals in such formulations raised concerns from Developed world warning people about the ill effects of such “alternative medications”[Saper et al, 2008]. However, later follow up studies revealed that there was a need to investigate the bioavailable metals and bioaccessible levels of these metals in the light of potential toxicity [. Thus there is a huge gap between effect of ayurvedic medications and scientifically validated explanations. The emerging knowledge of nanotechnology combined with carefully conducted analytical testing could throw some light on the therapeutic efficacy of these preparations. The proposed objectives of our future studies with respect to Mahayograj Guggulu are enlisted below-

- Establishing the presence of nanoparticles in the Mahayograj Guggulu preparation (at IIT Roorkee).
- Verifying the chemical composition and nature and phase of these nanoparticles using state-of-the-art techniques like Scanning and Transmission electron microscopes, nanoparticle tracking system, Inductively coupled Plasma Mass Spectrometer (ICPMS), XRD and Atomic Force Microscope (at IIT Roorkee).
- Establishing bio availability of metals in Mahayograj Guggulu using suitable bioassays (at IIT Roorkee).

With a long term goal of “Elucidating the mechanism of action of this herbo-mineral preparations”.

Dr Navani’s group at IIT Roorkee has access to state of the art equipments in the laboratory as well as Instrumentation center of IIT. Navani group is involved in conducting NanoBiotechnology research with experience in creating “Bio-Active” metal nanoparticles and using Gold and Silver nanoparticles to develop nano-antibiotic and well as nanosensing systems.

Dr Rakesh Aggarwal has 38 Years of experience and is having lineage of 100 years in Healthcare, himself belonging to 3<sup>rd</sup> generation Ayurvedic Doctor treating various chronic

diseases along with team of Doctors, having GMP certified pharma by the name of “Indian Herbals & Natural Ayurvedics” Muzaffarnagar (UP) & Editor of India’s most popular Family Health Magazine “Arogyadham”

## Reference

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