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## Molecular mechanism of action of potentized homeopathic drugs: An evidence-based hypothesis

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**Background:** Molecular mechanism of action of potentized homeopathic drugs, particularly those ultra-highly diluted remedies is still being harnessed with evidence-based research. Recent discoveries of retention of nano-particles of the original drug substance in these remedies have renewed fresh interest in understanding probable molecular mechanism of action of these remedies.

**Objectives:** To examine validity of the “gene regulatory hypothesis” to explain mechanism of action of ultra-highly diluted remedies in living systems.

**Materials & Methods:** Animal models *in vivo* like mice, rats, human subjects and bacteria, bacteriophage and yeast were used as materials; normal and cancer cells were used for *in vitro* experiments. Suitable controls were maintained. Various modern cytogenetic (CA, MN, SHA, MI, Comet assay etc) and molecular biology techniques (RT-PCR, microarray analysis, signal pathways, DNA methylation and histone acetylation) were used apart from compound and electron microscopies (scanning, transmission, atomic force and confocal) and immunochemical assay. Simple innovative techniques for nano encapsulation of and nano precipitation by homeopathic mother tinctures and their biologically active components were also used to elucidate some unexplored aspects.

**Results:** Ultra-highly diluted homeopathic remedies could trigger ameliorative effects in various model test organisms while succussed alcohol (placebo) could not. Potentized remedies could repair / protect radiation induced DNA and tissue damages and antagonize/ameliorate several types of experimentally induced tumors/cancers in mice; certain remedies demonstrated apoptotic effect on cancer cells *in vivo* and *in vitro* while succussed alcohol failed to show such effects. Expression of some key signal proteins and mRNA expressions in experimental models could be modulated by potentized homeopathic drugs. Under arsenic stress, *Escherichia coli* and *Saccharomyces cerevisiae* responded favorably to potentize homeopathic remedies. Ceratin potentized drugs (30°C) demonstrated favorable changes in gene expression profiles of cancer cells in microarray analysis.

**Conclusion:** Overall results provide convincing evidences of potentized remedy’s ability to trigger favorable regulatory changes in gene expressions, possibly through epigenetic modifications.

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