

# BIOAVAILABILITY & BIOEQUIVALENCE: PHARMACEUTICAL R & D SUMMIT

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## Protective efficacy of natural herbs against radiation and heavy metals induced changes in mice

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The heavy metals, even though do not have any biological role, remain present in some or the other form, harmful for the human body. Various public health measures have been undertaken to control, prevent and treat metal toxicity occurring at various levels, such as occupational exposure, accidents and environmental factors. Metal toxicity depends upon the absorbed dose, the route of exposure and duration of exposure, i.e. acute or chronic. This can lead to various disorders and can also result in excessive damage due to oxidative stress induced by free radical formation. Contamination of environment by heavy metal is a result of vast industrialization, urbanization, enhanced vehicular traffic and increased use of fertilizers and pesticides in agriculture. All these constitute an important class of toxic substances, encountered in number of occupational and environmental circumstances. Lead, cadmium and mercury are considered to be major environmental pollutants, which are widely used in industry, agriculture, and medicine, and circulate in ecosystems. The increasing dependence of human on radiation for energy requirement, therapeutic usages and the perceived threat of radiological terrorism has led to the hunt for a safe and effective radiological protective agent worldwide. Toxicity and unwanted side effects of chemical radio protectors at the effective dose levels have limited their clinical efficacy, so the focus is on natural products based on plants and their active constituents which have limited or no toxicity. Adding to its advantage is also the easy availability of the plants, which are consumed in one form or the other across the globe. Chemical radiation protection is an important strategy to protect living being against deleterious effects of radiation. Earlier the synthetic chemical substances, which could minimize the pathological changes in the living system after exposure to ionizing radiation, were looked into. Medicinal plants are the local heritage with global importance. World is enclosed with a rich wealth of medicinal plants. Herbs have always been the principle form of medicine in India. Several Indian medicinal plants (*Emblica officinalis*, *Aloe Vera*, *Osmium sanctum*, *Rosemarinus officinalis*, *Moringa oleifera*, *Trigonella foenum-graecum*, *Alstonia scholaris*, *Tinospora cordifolia*, *Panax ginseng* etc.) or plant-derived compounds that have been reported to be effective in countering the harmful effect of radiation in different experimental models of radiation injuries were evaluated for their possible role in radiation countermeasure strategy. The radiation exposure can cause numerous pathophysiological conditions including oxidative damage, inflammation and fibrosis, processes known to affect the survival of organisms. These natural herbs have been proved to be potent enough to check the radiation and heavy metals induced histopathological, biochemical, histochemical and hematological levels in animal models.

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