OMICS Group Conferences
Accelerating Scientific Discovery
2nd International Summit on Toxicology
October 7-9, 2013 Hampton Inn Tropicana, Las Vegas, USA

In vitro molecular hematopoietic assays as substitute of *In vivo* tests in regulatory toxicity study of drugs

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Abstract

One of the most significant trends in modern research in recent years has been the recognition that Hematopoietic progenitors can be used as very effective alternatives to animal research. These methods usually take less time to complete than the crude, archaic animal tests that they successfully replace. In addition, they cost only a fraction of the total cost of animal experiments and are not affected by species differences that make applying test results to humans difficult or impossible. Other than Hematopoietic assays, other Effective, affordable, and humane research methods include sophisticated *in vitro*, genomic, and computer-modeling techniques.

The type of hematopoietic assays most frequently and most thoroughly studied *in vitro* is the acute effect of toxicants on bone marrow progenitors, such as granulocyte-macrophages (CFU-GM), erythroids (CFU-E), and megacaryocytes (CFU-MK) which is quantified from the number of surviving progenitors as a function of exposure level under maximally stimulatory cytokine concentrations.

In the present study, potassium nitrate was assessed for its toxic potential on the CFU – GM colonies at the dose level of $4x10^{-8}$ mg/ml to $4x10^{-1}$ mg/ml. No toxicity is observed at molecular level which could be related to the dose of potassium nitrate. However, dose related insignificant inhibitions of CFU-GM colonies were observed. *In vitro* tests minimize the chances of uncertainties of toxicological investigation because of exploitation of animals and human and hence give a clearer picture for calculating clinical dosages.

Biography

R. K. Singh has completed his Ph. D. at the age of 25 years and D. Sc. at the age of 37 years from Lucknow University, India. I have published more than 200 papers and serving as a member of editorial board in several journals of repute. At present, I am working as Deputy Director (Senior Principal Scientist) at CSIR-Central Drug research Institute, Lucknow. To my credit 25 students have completed their research work for Ph. D., 2 for D. Sc. and 2 for M. D. degrees.