
International Institute of Biotechnology and Toxicology

Pesticides constitute important component in sustaining global food crisis due to population explosion. No doubt these man-made chemicals have significantly contributed to higher yield of both edible and fuel crops, there are concerns on the safety to man and impact on environment. While use of these chemicals in developed economies is more mechanised and regulated with almost near zero accidental exposure, their exposure limits and nonjudicious use are often matters of concern in other economies. Thus, we need to make assessment based on actual user scenario, a point not so well received by industry. Risk assessment of new discovery agro chemical is a challenging task in view of emerging issues of health concerns. Internationally accepted and validated strategies covering, test procedures in sensitive animal models, interpretation of resultant animal studies to make candid decisions on Acceptable Daily Intake (ADI) for consumer, Maximum Residue Limit (MRL) in crop of use, workman and exposure standards, disposal of expired and unused pesticides are all well established. These standards are reviewed at frequent intervals by OECD / FAO and regulators across the globe, and new decisions on safety and decision to their continuation or otherwise are taken based on new user population based on health and safety data. Although currently available animal methods have only limited potential for extrapolation of hazard to make risk assessment to man, need for newer tools was felt quite some time ago. Intensive Research supported by both industry and public funded bodies in areas of in vitro models to reduce dependency on animals, evidence from systems biology and toxicology, understanding adverse outcome pathway, metabolomics, miRNomics, evidence based toxicology and read across initiative all have contributed significantly in making risk predictions to man in ecological species more pragmatic and quicker than time consuming animal studies. It is time, therefore, we tune ourselves to these 21 Century tools to apply more scientific basis in drawing conclusions on safety of pesticides.