Biosafety
ISSN: 2167-0331

El-Allawy, Biosafety 2013, 2:3
DOI: 10.4172/2167-0331.1000115

Short Commentary Open Access

# Modern Technology Development and Biosafety Contribution

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Among the recent trends for assessment of biosafety of modern medicine is the application of research and development system (R&D), as well as encouragement of directing scientific research towards modern technology, including biotechnology and genetic engineering.

Biotechnology is in fact not new, but has been used for centuries, for example, fermentation and plant tissue culture are probably considered as old biotechnologies that have helped in producing nutritive foods and alcoholic beverages. These two technologies are still very useful, especially with a combination of modern science, such as molecular biology, biochemistry and molecular genetics.

The development of modern plant biotechnology has led to the production of novel plant varieties that would never have been possible using traditional breeding methods. Thanks are due to genetic engineering, which represents a milestone in the course of human knowledge progress, whereby gene manipulation, the selective management and alteration of the genetic component of a cell or organism became possible.

The number and importance of discoveries and advances in the field of biotechnology suggest that this century will not only present significant opportunities for agriculture, but will also involve the debate on the ability to insert desirable traits in plants for the production of the first generation of biotechnology products, that can help to enhance production of a second generation that will expand opportunities for farmers for the cultivation and production of various quality traits of functional food crops .

By the virtue of biotechnology, preparation of commercial plants of genetically modified organisms became available in various part of the world, *viz* production of transgenic cucurbit crops resistant to *Zucchini yellow mosaic potyvirus,* development of transgenic wheat with improved tolerance to environmental stresses, as well as other transgenic plants with resistance to insect, virus and tolerance to herbicides, including corn, soybean, cotton, eucalyptus, sugar cane, tobacco, potato, sweet corn and papaya. Now a days, processed food containing genetically engineered DNA or protein above the maximum threshold level (4%) has been accepted in some countries. However, the use of genetically engineered agricultural products for biosafety measures and public health safety, have to be ethically analyzed, case by case, under several perspectives, such as (i) relevance of recombinant DNA technology for the sustainable development of businesses including small farming (ii) technology safety for the consumer and for the environment, according to the existing scientific knowledge (iii) certification of origin of some non-transgenic commodities, and (iv) consumer's right to choose its food through adequate labeling.

The multiple gene transfer protocols are taking place to maximize the potentials of biotechnology, for example, the international consortium members with the leadership of Japan, US, China Korea, Taiwan and India.

Realizing that biotechnology is a new tool in development, it, therefore, needs a new policy, effective regulatory mechanisms, such as biosafety issues, intellectual property and safeguards, so that the impact of this advanced technology will become more productive and benign.

The biotechnological progress extended also in the medical field and molecular genetics that pushed the frontiers in laboratory medicine. In that concern and during the past years, the science and practice of laboratory medicine moved forward at a highly accelerated pace towards developments in molecular genetics, cellular signaling mechanisms, investigative and diagnostic technology applications. Similarly, new insights were gained regarding the biology of cancer and cardiovascular disease, the biology of acute and persistent infections, the role of cell survival and cell death processes in embryologic development, injury and repair mechanisms, carcinogenesis and aging.

Nowadays, genetic engineering can interfere to produce progress in human memory and intelligence and during the last decade, in was possible to improve learning and memory in mice by adding a single gene to the mice to increase their ability to solve maze tasks, learn from objects and sounds. This point would direct the attention to the enthusiastic role of gene therapy. In this regard, laboratory medicines has been markedly enriched by a growing appreciation of the need for careful correlation between genotype and phenotype in singularly, or multiply manipulated "knock-out" or "knock-in" genetic models of disease. In this context, extensive efforts to establish guidelines, protocols and standards for the conduct of pathology and laboratory medicine services, as well as recommendations regarding biosafety in the context of infections and treatment should be among the major subjects of discussions in published literatures.

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**Received** July 18, 2013; **Accepted** October 18, 2013; **Published** October 23, 2013

**Citation:** El-Allawy RMM (2013)Modern Technology Development and Biosafety Contribution. Biosafety 2:115. doi:10.4172/2167-0331.1000115

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