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Review of Present Trends and Future Scope of Pharmacogenomics in Drug Discovery and Development Process

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Abstract : Pharmacogenomics combines traditional pharmaceutical sciences such as biochemistry with annotated knowledge of genetics, protein chemistry, and DNA polymorphisms. The difference of therapeutic efficacy of the same drug in different individual can be best explained by the study of genetic polymorphisms that underlie individual differences in drug response. The small change of the genome in one individual may make a drug inefficacious as oppose to the other patients. Such variability will bring the individualization of the therapy to obtain the best effects of the drug, as an example autologous dendrimer got a tremendous success in the cancer therapy of the individual.

Markers of exposure can determine whether the desired target tissues of a subject have been exposed to a drug at physiological concentrations. Gene expression profiling is a tool that can be used to characterize chemically induced toxicity in cells and/or animal models, in order to provide plausible explanations for observed toxicity in preclinical testing.

Pharmacogenomics holds the promise that drugs might one day in future be tailor-made for individuals and adapted to each person's own genetic makeup by the use of microarray technology to express the gene which in turn helps to develop receptor protein. The stability of the drug and its toxicity can be predicted prior to administration of the drug to the subject through the knowledge of computer assisted structural simulation and DNA reactivity technology respectively.

This article provides some critical aspects of drug developments, clinical trial design and ethical issues which are centered with pharmacogenomics.

Keywords : Pharmacogenomics, Gene Expression, Autologous Dendrimers, genetic polymorphism.

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