

Pharmacogenetics and Pharmacogenomics: The Road to Individualized Pharmacotherapy

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Pharmacogenetics and pharmacogenomics lead to a better understanding of interaction of drugs and organisms. The promise of pharmacogenomics in clinical medicine is that both the choice of a drug and its dose will be determined by the individual genetic makeup leading to personalized, more efficacious and less harmful drug therapy. The techniques of genomics and proteomics also help to understand interindividual variation in genome sequence, in the variable

generation of transcripts and proteins. All these variables have to be considered in explaining complex diseases and when defining new drug targets. Finally, genomics allows to study the effects of drugs on gene expression. The limitations of pharmacogenomics are the complexities of gene regulation, of protein structures and protein complexes, of gene-environment interactions and also of the psychological complexities of therapeutic outcomes.