

# Personalized Medicine: Toward Disease Prediction, Prevention and New Treatment Protocols

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Personalized medicine is the design of a medical treatment protocol based on individual characteristics of each patient. However, it does not involve design and production of a new drugs or medical devices for each individual. Rather, it targets categories of subpopulations that demonstrate different responses to a particular disease or a drug. The differences among individuals are based on clinical data, omics sciences and bioinformatics, which make possible early detection of a disease by screening populations and identifying the high-risk individuals for a specific disease and designing an individual-based treatment protocol. It is well-established that some drugs have no therapeutic benefit in certain populations because of their genetic makeup. Using the genetic and genomic characteristics, personalized medicine provides the best drug selection and dosing protocol for individual patients to achieve the desired treatment outcome. This is an effective way to reduce the time and the cost of clinical trials, side effects and to provide clinical care and treatment based on a patient's genetic content and molecular biology analysis. Therefore personalized medicine provides more effective, safer and higher quality of medical treatment with minimum side effects to the individual patient.

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