

Médecine Personnalisée Et Innovations Biomédicales:

*Enjeux de Santé Publique, Economiques,
Ethiques et Sociaux*

What is Personalized Medicine?

Personalized medicine (PM) is a new approach of medicine that focuses on the integrated diagnosis, and treatment and prevention of disease in individual patients

Medical model called « P4 Medicine »

Personalized, Predictive, Preventive, and Participatory



- to improve patient outcomes
- to provide more cost effective care
- to improve the relationship patient/physician

Personalized Medicine is driven by New Technologies





The NEW ENGLAND JOURNAL *of* MEDICINE

14th November 2013

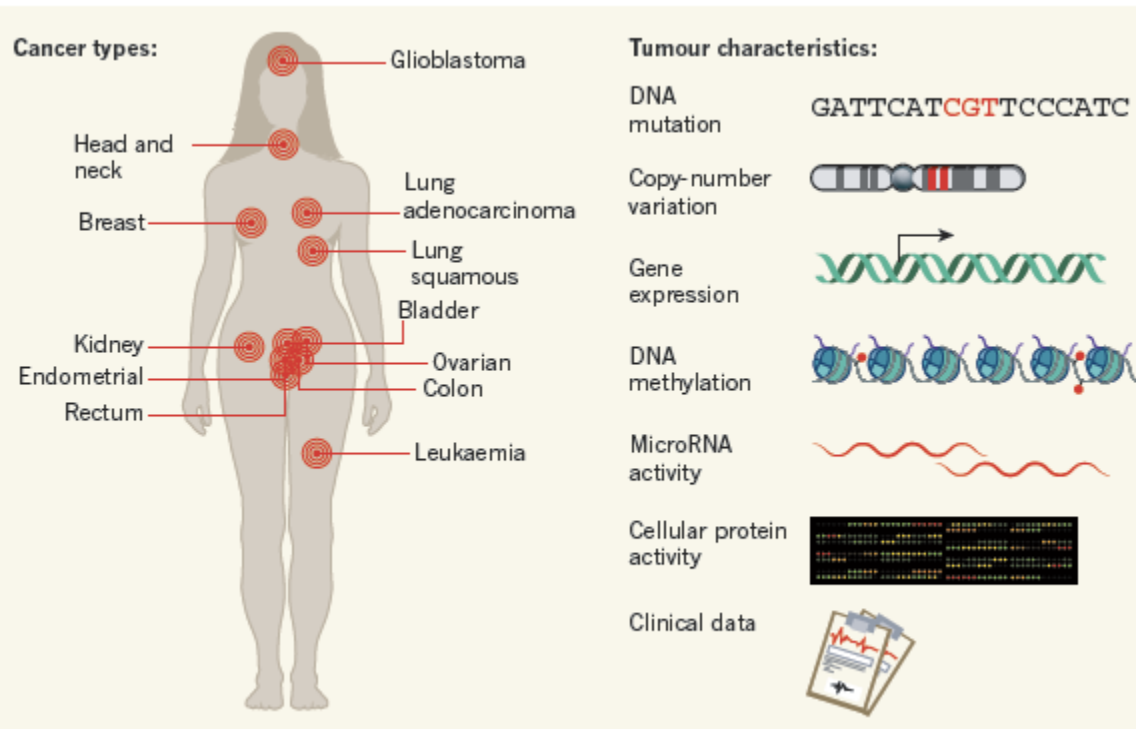
First FDA Authorization for Next-Generation Sequencer

Francis S. Collins, M.D., Ph.D., and Margaret A. Hamburg, M.D.

In this year which marks the 60th anniversary of the description of DNA structure by Watson & Crick and 10th anniversary of the complete sequencing of human genome, the FDA has granted marketing authorization for the 1st high-throughput genomic sequencer Illumina's MiSeqDx which will allow development and use of genome-based tests

Applications of Genome Sequencing

Cancer: International Efforts : ICGC / TCGA



Targeted therapies against specific mutations in individual cancers
→ **Therapies against several cancers that share common driver mutations**

Pharmacogenomics

Influence of genetic variation on response to drugs (GWAS)

>120 drugs with pharmacogenomics information

→ **Table of Pharmacogenomics Biomarkers**

<http://www.fda.gov/20%drugs/scienceresearch/researchareas/pharmacogenetics>

What the challenges of Personalized Medicine?

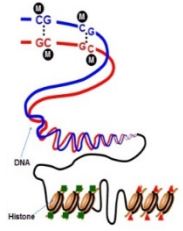
→ Scientific challenges : Need for Integration



DNA Variation



Gene Expression



Epigenomics



Clinical & Other Phenotypes



Microbiome

Environment
Exposome



**System Biology
Approach of Disease**

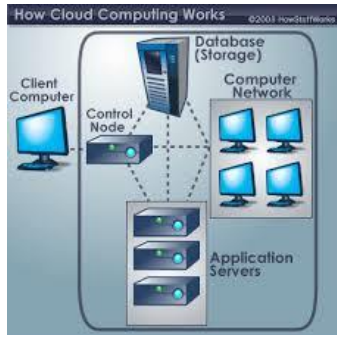


Protein-Protein interactions



Abstract
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Text Mining



Links between clinical information & biological information

« Big Data » issue

Interdisciplinary work

What are the challenges of Personalized Medicine?

Ethical Challenges

Social challenges

Economic Challenges

Public Health Policy