Bioinformatics, Biomarkers, Phenotypes, Therapeutics and Personalized Medicine to Advance Patient Health

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ABSTRACT
Bioinformatics faces the challenge of gathering, analyzing, shaping, and interpreting a staggering amount of data from multiple sources, and transforming it into augmented data to aid clinicians identify biomarkers and develop phenotype profiles for novel or personalized therapies, that will do the most good with least harm. This requires a tight integration of clinical, patient (EHR), and genomic data. Augmented-data phenotype profiles are of benefit for identifying and recruiting appropriate candidates for a) clinical trials and patient studies that require subsequent genotyping; b) endotyping heterogenous conditions; c) translate basic research findings into clinical practice; d) develop new therapeutic interventions directed at early disease stages when major pathologies may be more responsive to therapy; e) generate and monitor hypotheses about drug efficacy, drug and non-drug therapeutic interventions, and risk factors at a population level.

To highlight the aforementioned benefits, we present previous and on-going work in various areas: Airways diseases: Asthma and COPD [1-3], endocrine disorders: diabetes mellitus [4-6]; cardiovascular diseases: myocardial infarction [5-9]; autoimmune diseases: rheumatoid arthritis [9,10]; Mood disorders: bipolar disorder and major depression [11-13]; postmarketing surveillance [5-8]; and non-drug therapeutic interventions [14-16].

REFERENCES


