



Laboratory Medicine in the Era of Disruptive Technology

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Artificial intelligence for better health care

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A flood of multi-modal high throughput clinical genomic data and personal health records means that many of the challenges in biomedical research and healthcare are now challenges in integrative and computational sciences for their bidirectional translations. Our ability to ‘connecting the dots’ in the wealth biomedical big data will bring us the ‘big picture’ in a mass of genes, drugs, diseases, and diagnostic, therapeutic and prognostic markers. Precision medicine attempts to determine individual solutions based on the genomic and clinical profiles of each individual, providing opportunity to incorporate individual molecular data into patient care. While a plethora of genomic signatures have successfully demonstrated their predictive power, they are merely statistically-significant differences between dichotomized phenotypes that are in fact severely heterogeneous. Despite many translational barriers, connecting the molecular world to the clinical world and vice versa will undoubtedly benefit human health in the near future. A method and system for precision pharmacology empowered by whole exome sequencing for personalized prevention of adverse drug reactions for all drugs will be presented as the first-in-class clinical application of personal genomes.