IN THE LOOP

Your Gene's Choice: Precision Medicine

ESCO SCIENTIFIC

There is a reason why drugs, as they are tested on clinical trials, need several participants and phases before they are deemed safe for commercialization — each one of us responds differently to one drug. The efficacy and safety of the drug depend on several factors such as environmental, immunological, and physical makeup of each patient. All of these characteristics are most likely coded in the genetic makeup of the individual. Hence, precision medicine's goal is to tailor an effective therapy based on the genetic profile of the patient.

FROM ONE-DRUG-FITS-ALL TO PERSONALIZED THERAPY

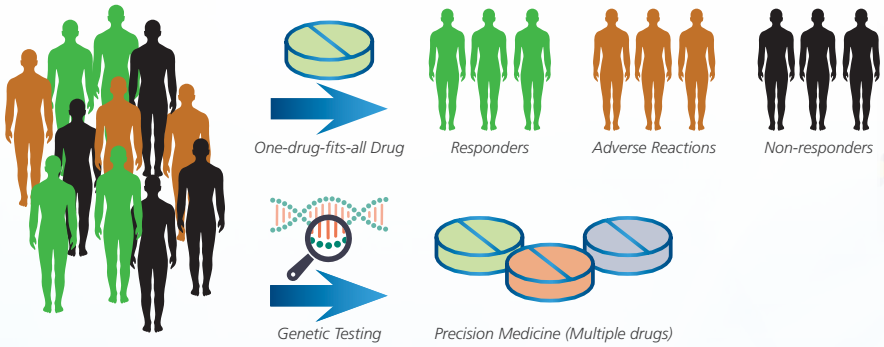

Figure. 1 Comparison between the process of precision medicine and one-drug-fits-all approach

Personalized medicine is based on pharmacogenomics, which studies the genomic information of the patient in response to drugs.

Genome-wide association studies (GWAS) have been useful in developing base knowledge on which genetic profiles would most likely respond to the drug/therapy or would not cause adverse effects. These studies are based on the medical history of patients that have been profiled for their genetic make-up.

These studies are key to developing genetic tests to identify biomarkers, variants, or single nucleotide polymorphisms (SNP) related to drug/therapy response.

EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) MUTATION TESTING

To illustrate, metastatic non-small cell lung cancer (NSCLC) therapies include EGFR-tyrosine kinase inhibitors (EGFR-TKIs). These therapies are established to be effective for patients who have activating mutations in exons 18-21 of the EGFR (i.e., exon 19 deletion). These patients benefit from the first-line treatment of EGFR-TKIs with improved clinical benefits and more tolerable to chemotherapy. Other mutations, such as T790M, are associated with resistance to first-generation EGFR-TKI and thus, would require third-generation inhibitors such as osimertinib.

Mutation and polymorphism testing such as EGFR mutation testing can be achieved through PCR workflow.

TAILORED PRODUCTS FOR YOUR SPECIFIC PCR APPLICATION NEEDS. MAKE IT PERSONAL WITH ESCO!

Figure 2. Standard PCR workflow and corresponding Esco products for each step

Reference:

[1] Chiang, A. C., Fernandes, A. W., Pavilack, M., Wu, J. W., Laliberté, F., Duh, M. S., ... Subramanian, J. (2020). EGFR mutation testing and treatment decisionsin patients progressing on first- or second-generation epidermal growth factor receptor tyrosine kinase inhibitors. BMC Cancer, 20(1). doi:10.1186/s12885-020-06826-0

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