



Drug Discovery Techniques

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The pharmaceutical science had a glorious history of tremendous drug development involving recent technologies since ancient era. Pharmaceutical industry believes the development of new medical treatment pathways by discovering various products but it remains high expense with risk. In a recent research, Tufts center for study of drug development exhibited that it takes about 10-15 years to develop any new medicine with the cost of \$2.56 billion. The cost of production is not just that makes the high cost of medicine but million costs utilized for protecting Intellectual property rights (IPRs).

A new research showed that 3D printing for medical applications could have raised the market cost \$2.13 billion by 2020. Patents protect the companies in the terms of copycats and reproducibility of generic products at comparatively lower cost. In many countries the period of patent remains for 20 years from the date of filing. Since last century, the technology has demonstrated a significant role in driving pharmaceutical innovation [1].

Microchips lined by living human cells could make revolutions in drug development, disease modeling and personalized medicines. According to UK, there is progressively growing the antibiotic-resistance-bacteria, solely responsible for 700,000 deaths globally per year and can be increased up to 10 million by 2050. The antibiotics discovery has been highly expensive for pharmaceutical research thus failing to develop economical feasible drugs over-time. These microchips are called 'organs-on-chips' connecting the systems altogether in such a way to have whole 'body-on-a-chip' giving an ideal system for drug discovery [2]. In 2001, the disease chronic myelogenous leukemia (CML)- a bone-marrow cancer had few effective treatments but after 14 years with continuous progressively advancement in treatment of cancer and disease condition is managed well. Today, most likelihood drugs from ongoing

clinical research finally are getting approved about less than 12 percent [3]. A drug believed to be used in the treatment of medical conditions prior goes for extensive testing and cost-effectiveness parameters. Generally, up to 5000-10000 molecules for each potential drug approval is screened out by multiple screening tools. For every 25000 compounds taken for study in laboratory are evaluated only 25 on men and 5 make to launch in market. The high cost of current drug development is associated with evaluation of complex medicines with the use of genomic markers for better and significant prediction of drug response. It may be believed that in future we will become familiar with most flexible drug development process with easy regulatory framework. Before drug discovery, disease or medical condition is studied by researchers/scientists. On an average, 4-5 years are taken to develop a new molecule successfully. £436 million- average cost to innovate and develop a successful medicine [4]. Recently, technology has enabled an increase in drug discovery and development by various ways as bioinformatics, more data including genetics, biomarkers, tissue sampling, patient responses etc. are digitalized with optimization for better data mining - identify correlations, datafication of tissue, consumer technologies- avail drugs through phone calls [5].

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