



Drug development and Technology

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Drug development process takes, on an average, at least 10 years for a drug to make the journey from discovery to the market place at an average cost of \$2.6 billion, according to a new study in the Journal of Health Economics. The overall cost includes not only the development costs for drugs that successfully made it to market, but also for the drugs that failed along the way. No more than 1% of drugs in the discovery and development pipeline will reach the market place. That's why drug development process is often considered as "finding a needle in a haystack". It's a huge challenge for regulators to ensure drugs being manufactured are adhering to uniform standards of quality and safety.

The development of new technologies is playing a pivotal role in the advancement of drug discovery and drug development. Researchers by using certain technologies early in the drug-development process can identify issues that might cause a drug to fail early on, in many cases before the compound even goes into clinical testing. Then they can either modify the compound to address the issues, while maintaining the therapeutic effects, or make an early decision to no longer pursue the drug candidate, thereby averting a more expensive later stage failure.

Technological advances in pharmaceutical drug development improve the speed, performance, cost and results of research efforts. The implementation of these techniques is allowing greater global collaboration, faster research decisions and more effective crunching of increasing amounts of data. The continuing evolution of new technologies, such as 3-D biological printing, ultra-high-resolution analytical instruments, next-generation sequencing, desktop electron microscopy, gene therapy, translational research, stem cell therapies, machine learning and augmented intelligence and microbiomics are changing the traditional rules for drug development, as well as the FDA (Food and Drug Administration) changing its own rules. These changes are happening at the right time as new drug development challenges are simultaneously appearing,

which include increasing antibiotic resistance, the Ebola epidemic in Africa, aging global populations, the reappearance of tuberculosis and more.

According to research by Advantage Business Media, the greatest advances in drug development over the next several years will be in the treatment of cancer (71% of survey responses), followed by diabetes (38%) and neurological diseases (34%). Cancer is also considered to be the most challenging area of drug development research (59%), followed by neurological diseases (39%) and genetic diseases (35%). The technological areas most associated with advances in drug development over the past 10 years have been molecular biology (93%), genomics (91%) and genetic animal models (88%).

The rapidly changing faces of drug development, as well as the technologies involved in the research, create an environment that will only accelerate in the next several years. The rapid globalization of the drug development environment will serve to alter that technological face. Nonetheless, these nascent technologies hold ample promise and their proper execution will definitely prove to be a trump card for the drug development.

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