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Opinion Article

Applying Bioinformatics in Clinical Drug Discovery

Ioannis Louka*

Department of Systems Biology, Biomedical Research Foundation, Academy of Athens, Athens, Greece

DESCRIPTION

Bioinformatics can remove, break down, analyze and communicate hidden information from sequences and structures as well as functional knowledge of nucleic acids and proteins in order to discover and identify new drug targets. This might potentially guide the plan of therapeutic drugs that can activate or block the biological functions of biomolecules and helps to build different prediction models to help virtual bioactive screening. Bioinformatics examinations provide key data of the process of the whole drug discovery and development process. Drug discovery and improvement is a complex, high risk, time consuming and potentially highly rewarding process. This will help to find more secure and more proficient therapeutic drugs that can either initiate or block the natural elements of biomolecules. Drug organizations in a real sense spend a large number of dollars per drug to carry it to the market. The improvement of any new drug requires technological expertise, human resources and huge capital investment.

It likewise requires severe adherence to guidelines on testing and assembling principles before another drug comes into market and can be utilized in everybody, as a matter of fact, some time many of the drugs fails to enter into the market. All the factors like failed testing leads to increase in the cost for a new drug entity research and development. Branches which help in constructive outcome on drug planning process and also decrease the general expense and hazards are known as bioinformatics and pharmacogenomics. Their training in drug planning process created constructive outcome on by and large cycle and they can speed up different strides of drug planning, and lessen the expense throughout the time. Drug discovery is the step by step process by which new drugs which are capable are found. Traditionally, drug organizations follow deep rooted pharmacology and science based drug discovery approaches, and face different challenges in tracking down new drugs. Drugs are generally developed when the specific drug target for those drugs actions which have been identified and studied. Similarly, BLAST helps in comparative genomic analysis, which includes the examination of genome sequences from various multiple organisms. Comparative genomic analysis is a powerful tool that is mainly utilized during the design process of novel drugs all over the world.

The quantity of potential targets for drug discovery process is increasing exponentially. Mining and warehousing of the human genome sequence utilizing bioinformatics has assisted with characterizing and arranges the nucleotide pieces of those genes, which are responsible for the coding of target proteins, in addition to identifying new targets that offer more potential for new drugs. Bioinformatics permits the identification and analysis of increasingly more biological drug targets; hence expected to enormously build the benefits of possible drugs ready to go off to the drug market. Bioinformatics provides strategies and algorithm to predict new drug targets and to store and manage available drug target information. After the discovery of "potential" drug targets, there is an insignificant need to establish major areas of strength for a between a putative target and disease of interest. The foundation of such a key association gives support to the drug improvement process. This cycle, known as drug target approval, is a region where bioinformatics is playing a huge and important part. The on-going high cost of drug research and improvement is a significant reason of concern among pharmaceutical companies. Advances in bioinformatics speed up drug discovery process, starting with drug target identification and validation to measure advancement, and virtual-high-throughput screening. These all are fully done with intent of identifying new potential chemical drug at low rate and with great effects. Specific latest bioinformatics applications have improved the dose-response, toxicity profile, and overall efficacy of drugs used to treat a number of genetic diseases, including gene sequencing, genetic statistics, and the measurement of gene expression levels. There is likewise an expense related with the elongated process, starting from discovery all the way to final approval. Bioinformatics gives more efficient target discovery and validation approvals, thus help to ensure that more drug candidates are successful during the approval process and making it more cost-effective.

Correspondence to: Ioannis Louka, Department of Systems Biology, Biomedical Research Foundation, Academy of Athens, Athens, Greece, E-mail: ilouka@bioacademy.gr

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