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Letter to Editor

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A Quick Overview of Recent Approaches to the Synthesis and Design of New Drugs

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Dear Editor,

Drug discovery studies from past years to the present shows that the type of drug discovery process is directly correlated with the pharmaceutical industry, drug prices, and annual drug sales. Indeed, research has displayed that the cost of pharmaceutical studies at human levels and animal stages should be replaced with pre-synthetic drug research. The development of new methods such as genomics, proteomics, bioinformatics, high-throughput screening, combinatorial chemistry, microarray technology, and ADMET (absorption, distribution, metabolism, excretion, and toxicity) has directed to a better understanding of the mechanisms of drug action and targets, thereby leading to the introduction of more reliable drug candidates (1).

In recent years, the link between chemistry and biological findings has made the process of drug discovery based on rational principles to predict its action. An example of the drug discovery process using biological information including gene and protein expression, modulation and regulation, and cell signaling is related to HIV protease inhibitors. Medicinal chemists have employed cellular studies, molecular modeling, and biological information to design appropriate enzyme inhibitors (2). Certainly, the design of new drug molecules is not well defined and depends on a variety of factors. Investigating the molecular structure of drugs and their activities, as well as investigating the crystallographic studies on complex or non-biological complex drugs with drug molecules, has greatly contributed to the advancement of the drug discovery process. Given the trend of drug discovery in recent years, highly effective drugs have been designed and marketed to control hypertension, osteoporosis, migraine headache, asthma, and so on. However, there are many research opportunities for designing new molecules and more advanced studies such as drug delivery and ADMET topics.

The use of macromolecules such as crown ethers as drug carriers and many other polymers has opened up a new perspective for researchers (3). It can be stated that the importance of connecting chemistry and biology to tissue engineering is quite clear. Research around tissue engineering has focused on developing non-immunogenic materials to serve as scaffolds for the regeneration of damaged tissue. In fact, with the development of new polymeric matrices with high absorption potential, adhesion to appropriate cells, and the possibility of developing blood vessels (angiogenesis), significant advances will be made in tissue engineering. The synthesis of body-compatible polymeric scaffolds and the development of computer simulation techniques is the first step in tissue engineering research. Although tissue engineering research faces many challenges and questions, it is hoped that scientists will make significant progress in this area in the future (4).

Conflict of Interests

The authors declare no conflict of interests.

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