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Editorial Open Access

# Biochemistry, Drug Development and Open Access

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Studies on biochemistry have contributed greatly to our current understanding of human diseases and to the development of drugs for the treatment of diseases. However, the traditional way to disseminate new research findings, including those in biochemistry, is to have the findings published in journals printed on real papers, which are accessible to privileged researchers or scientists with individual or institutional subscriptions. The tide has turned. It is the internet era; it is the post-genomic era; it is the time that demands a more efficient, more rapid way to communicate new findings in biochemistry and drug development to a greater community; and it is the time to celebrate the birth of our new Open Access Journal: "Biochemistry and Pharmacology".

Following rapid social and economic development, more and more people have gained the access to adequate education and the awareness of the relevance of biochemistry to human health. As a result of this trend, more and more people have the interest and intellectual ability to read and think about the pathological processes and treatment of human diseases, - particularly those high incidence diseases with great social economic impact, such as cardiovascular diseases, cancer, infectious diseases, metabolic disorders etc. No matter what the diseases are, they always are associated with biochemical changes at the cellular levels. In fact, many drugs used in current clinical practice are targeting either the metabolic pathways or the signaling pathways that regulate the metabolic processes. Aspirin, for example, has been used as a painkiller, a non-steroidal anti-inflammatory drug and an anticoagulant in prevention of cardiovascular disorders; these pharmacological applications are primarily based on its inhibitory effect on cyclooxygenase (prostaglandin synthase) activity that is indispensible for the biosynthesis of prostaglandins [1]. Another example is the well-known statin family of drugs used to lower blood cholesterol levels, which represses HMG-CoA reductase, the rate-limiting enzyme of the *de novo* cholesterol synthesis pathways [2]. Moreover, new therapies in development, such as histone deacetylase inhibitors, also are based on solid biochemical foundations [3]. Finally, adverse effects, resistance, biotransformation and disposal of drugs in human body also involve complicated biochemical processes. Accordingly, all these biochemical processes, regulatory mechanisms of cellular metabolism, changes of metabolic processes under pathological states and the causes of these disease-related metabolic changes become increasingly interesting topics not only for researchers, physicians and drug developers, but also for patients, future professionals and ordinary readers.

In addition to small molecule-based drugs, new approaches such as bioengineering and gene therapy, to disease management are emerging. Although those new therapeutic strategies are apparently not directly related to biochemistry, in reality, biochemistry remains the basis for the target identification, target validation, bioengineering processes, and the regulation of transgene expression in the case of gene therapy.

The completion of human genome project has not only accelerated the speed of biochemical discoveries and pharmaceutical development, but also has revealed the surprising fact that many gene products have not been functionally or biochemically characterized, and that many aspects of basic cell metabolism, particularly under various disease states, remain unclear. Interestingly, new – OMICS methodologies, such as proteomics, transcriptomics, epigenomics, metabolomics, glycomics and pharmacogenomics have been developed and applied in research and development. Consequently, the post-genomic era becomes a golden era for biochemical research, drug target identification and pharmaceutical development. How to timely and efficiently disseminate this rapidly growing knowledge body to all interested parties becomes a new challenge; the combination of digital processing, internet technology and Open Access policy provides an ideal strategy to meet this challenge.

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