

## **About bio convergence technology, bio technological medicine and drugs: Analysis of literature.**

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### **Abstract**

**In order to improve the quality of health services, healthcare providers are searching for new and better approaches. One of them is bio technology. Bio technology has key proposals in human health-related services development. To determine the frequency of the articles about bio technology is the main objective of the study. An exclusive search was conducted in PubMed; a medical database of the U.S. National Library of Medicine. Keywords such as Bio Convergence Technology (BCT), Bio Technological Medicine (BTM) and Bio Technological Drugs (BTD) were searched. Various medical journal types were analysed. It was evident that interest on this subject begun almost 10 years ago and between 2012-2016 there has been a considerable increase in research about bio technology in the medical field. Total of 280 articles were comprised the term BCT. 3 were conducted between 1997-2001, 8 between 2002-2006, 17 between 2007-2011 and 252 between 2012-2016. Total of 114 articles were found to include the term BTM. Most of the research (n: 78) were conducted in the last decade whereas, only 1 article was found on the 80's. Total of 52 articles were cited that included the term BTD. It is evident that there has been a considerable increase in research about bio technology in the medical field from 1980's to the 21<sup>st</sup> century. Most of these researches however; were cited in special issues. More research on this subject need to be published in the medical journals.**

**Keywords:** Bio convergence technology, Bio technological drugs, Bio technological medicine.

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### **Introduction**

In order to improve the quality of health services, healthcare providers are searching for new and better approaches. One of them is bio technology. Bio technology has key proposals in human health-related services development.

The word biotechnology was first used by Karl, a Hungarian agricultural engineer, in 1919; featuring the use of living organisms on a given raw material for the purpose of obtaining a particular product and introducing the concept of genetic change [1]. Biotechnology means, by using biological systems and processes to solve problems and produce useful products. The essence of bio technology is the use of living systems and organisms or their derivatives in product development and technological processes. In today's world, the importance of biotechnology is increased in many fields, from medicines to agriculture, from animal husbandry to textiles, from defenceless to energetic.

Biotechnology has a key role in the advancement of health care. The vast majority of known diseases cannot be treated at the present time. Biotechnological methods are becoming more effective against diseases, especially in the development of new drugs. In recent years, most of the drugs developed for chronic diseases are biotechnological drugs [2,3].

Pharmaceutical industry started with the production of penicillin in 1928. Biotechnological production in the pharmaceutical was first used in the 1980s in the treatment of diabetes with human insulin produced by recombinant DNA technology. Antibiotics, hormones (erythropoietin, somatotropin growth factors), cytokines, enzymes, insulins, immunomodulators, monoclonal antibodies, blood factors and vaccines are among the drugs used in various therapeutic fields within the scope of biotechnological drugs. These products are divided into reference biotechnological drugs and bio-similar drugs. Conventional drugs are based on cell based production of the basis of biotechnological drug production, while generally produced by a process called chemical synthesis.

Biotechnological products have made a revolution in human health. However, these are expensive products because of the high production and development costs [2,3].

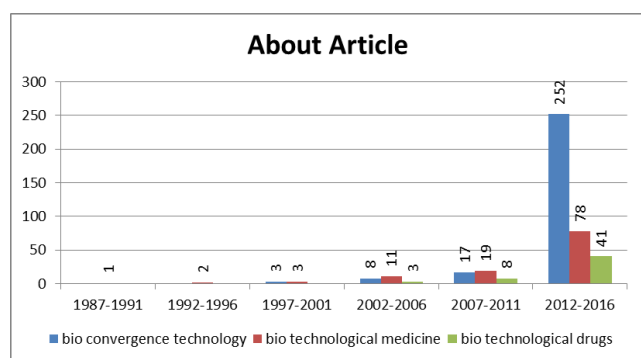
To determine the frequency of the articles about bio technology is the main objective of the study.

## Material and Methods

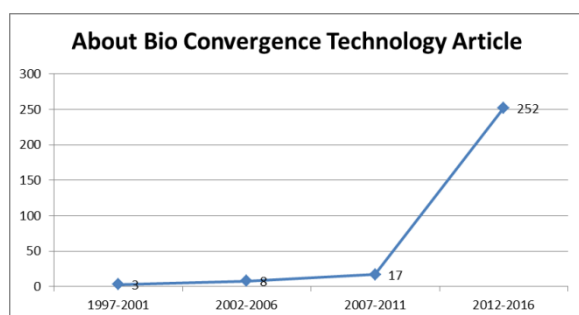
An exclusive search was conducted in PubMed; a medical database of the U.S. National Library of Medicine that includes over 16 million citations from MEDLINE and other life science journals for biomedical articles. Keywords such as Bio Convergence Technology (BCT), Bio Technological Medicine (BTM) and Bio Technological Drugs (BTD) were searched. Various medical journal types were analysed.

## Results

It was evident from the research that in the last decade bio technology has gained considerable attention in the medical field. It is found that between 2012-2016 there has been a considerable increase in this field (Graph 1).



**Graph 1.** Analysis of research articles based on time periods.



**Graph 2.** Analysis of research articles based on bio convergence technology.

### Bio convergence technology (BCT)

Bio convergence technology defines the attempts on a variety of innovative bio health related topics which include discovery of biomarkers for detecting new diseases, the use of nano imaging technology as a source of new pharmacologic development, personalized food medicine therapy system, and medical-IT convergence technology [4]. Bio convergence

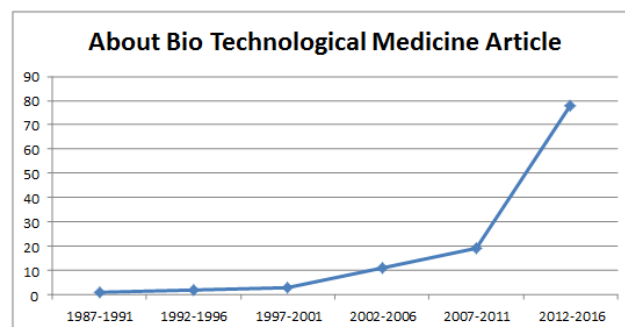
technology mentions that technology cannot be separated from health.

Total of 280 articles were comprised the term bio convergence technology. 3 were conducted between 1997-2001, 8 were conducted between 2002-2006, 17 were conducted between 2007-2011 and 252 were conducted between 2012-2016 (Graph 2).

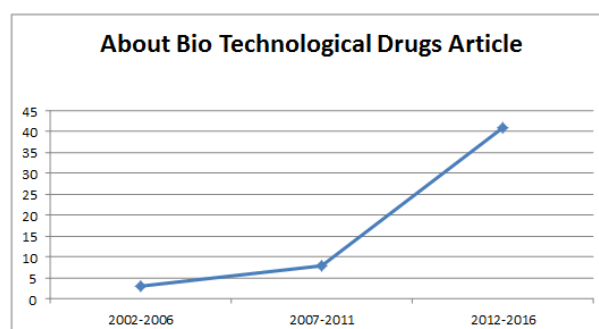
### Bio technological medicine (BTM)

One of the most important issues on health today, is the bio technological medicine. They are produced using techniques in which they use live organisms, their process and their parts are used for the absence of products to better your health [5]. Bio technological medicine can provide valuable opportunities for health industries to improve both science content and scientific practices.

Total of 114 articles were found to include the term BTM. Most of the research (n: 97) were conducted in the last decade whereas, only 1 article was found on the 80's (Graph 3).



**Graph 3.** Analysis of research articles based on bio technological medicine.



**Graph 4.** Analysis of research articles based on bio technological drugs.

### Bio technological drugs (BTD)

Bio technological drugs are a wide group of therapeutic agents obtained by means of genetic engineering methodologies. They act through the inhibition of specific cytokines/cells involved in the cascade of different pathological processes, leading to the modification of host immune response [6].

Total of 52 articles were cited that included the term BTB. BTB was the most commonly encountered strategy on the 21<sup>st</sup> century (Graph 4).

Biotechnology is based on scientific knowledge from different disciplines such as biochemistry, chemistry, genetics, engineering and computer science, microbiology for biological agents such as microorganisms, cells or molecules (antibodies, DNA, enzymes etc.) to provide goods and ensure services [7]. This multidisciplinary approach is the most important characteristic of this scientific field; so articles spread across different journals.

Analysis of research articles based on journal groups showed many differences. It couldn't be possible to categorize them in small groups. Most of the article on "bio convergence technology" were published in general medicine journals (n: 84, 30%), molecular medicine journals (n: 36, 12.85%) and microbiology journals (n: 26, 9.28%). Articles related with the term "bio technological medicine" showed a widespread distribution. Articles disbanded to cancer, biology, surgery, skin, ophthalmology, microbiology, genomics, general medicine, biochemistry, pharmacology, infection and technology journals almost equally. Associated with the concept of "bio technological drugs"; most of the articles were related with the field of general medicine (n: 14, 26.92%), drugs (n: 10, 19.23%) and molecular biology (n: 7, 13.46%).

## Discussion

Bio technology, which promoted revolutions in many fields, generates great expectations for the future, mainly in the pharmaceutical sector for the treatment of several diseases [8]. Based on biotechnological processes, new substances with different therapeutic applications, with a central focus on quality of life and public health, have been developed and produced on a large scale [9]. It is evident that there has been a considerable increase in research about bio technology in the medical field from 1980's to the 21<sup>st</sup> century. Most of these researches however; were cited in special issues. More research on this subject need to be published in the medical journals.

In order to become life-long learners and problem solvers; medical professionals need to be exposed to new strategies as well as understand the theoretical bases of bio technology.

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