ROLE OF BIOTECHNOLOGY IN UNDERSTANDING OF TRADITIONAL MEDICINE: A CRITICAL REVIEW

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ABSTRACT

Field of biotechnologies have participated a significant task in the development of Traditional medicines specially Ayurveda over many centuries. In current days the modern biotechnologies, molecular biologist and gene technologies have add a considerable role in understanding of the Inflammation (Shoath), Communicable diseases (Sankaramak Roga) and Cancer (Arbuda) etc and their management that represent to fulfillment of Health for all requirements. In addition, biotechnology should be considered one device in a larger range of scientific alternative, to be applied where it is needed and where it proposes the most excellent available choice for explain specific problems for health. Biotechnology contributes a noteworthy role to achieve the preferred health requirements to destroy the blasting diseases of the planet.

KEYWORDS: Biotechnology, Diseases, Ayurveda.

INTRODUCTION

Biotechnology is a thought that became well accepted in 1970 with the development of molecular biology. Biotechnology is the science which utilize for product development from ancient times. For thousands of years, humans have used selective breeding to improve production of crops and livestock to use them for food.[¹] Fermentation procedure was urbanized by the ancient Ayurvedic physician.[²] Ayurvedic masters of ancient India established a four divided research programme that is directly linked to human being, flora,
fauna and microorganisms. Their decisive purpose was the sustainable operation of biological resources for makes certain food and health.\[^3\]

The wide discernment of "biotechnology" face a widespread collection of communiqué for amend accessible organisms according to human purposes, going back to domestication of animals, cultivation of the plants and improvements to these through breeding programs that employ artificial selection and hybridization. Modern usage also includes genetic engineering as well as cell and tissue culture technologies.\[^4\] The American Chemical Society defines biotechnology as the application of biological organisms, systems, or processes by various industries to learning about the science of life and the improvement of the value of materials and organisms such as pharmaceuticals & medicines.

Indian traditional system of medicine, *Ayurveda* includes all aspects of living-health and sickness. Like other pathological conditions inflammation has been documented in the *Brihat Trayee*, the *Charaka Samhita*, the *Susruta Samhita* and *Astanga Samgraha* between 1500 BC and 600 AD. *Madhava Nidana*, in around 700 AD, a complete book on pathogenesis in *Ayurveda* is influenced by all the three books in its description of inflammation.\[^5\] Chronic inflammation precedes most cancers. Rudolf Virchow the German physician in the 19th century suggested a link between inflammation and cancer, cardiovascular diseases, diabetes and other chronic diseases. Indeed, in recent years his observations have been confirmed and a molecular basis of most chronic diseases and the associated inflammation has been identified.

Now a days, various institutes are working on the different concepts of Ayurveda.

**CSIR Ayurgenomics Unit –TRISUTRA, New Delhi**

Council of Scientific and Industrial Research (CSIR), India has established CSIR Ayurgenomics Unit – TRISUTRA (Translational Research and Innovative Science ThRough Ayurgenomics), at CSIR-Institute of Genomics and Integrative Biology, New Delhi, with a mission to develop affordable health care solutions based on traditional knowledge of Ayurveda, medicine and modern genomic knowledge. This is an inter-disciplinary networked centre that would enable cross talk between Ayurveda, Modern Medicine and Genomic science.

**Broad objectives of the Unit\[^6\]**
- Conduct research aimed at validation and providing scientific evidence to principles/concepts described in Ayurveda for predictive, personalized and pre-emptive approach towards health and diseased conditions.
- Develop data and sample repositories for prospective research studies.
- Develop interdisciplinary human resources.
- Undertake and co-ordinate translational research for developing affordable health care solutions for diseases of national priority based on Ayurveda literature.

This unit would strive towards providing scientific credence and global acceptability to Ayurveda, new leads to genomics, create interdisciplinary expertise and would also provide marketable leads that would be beneficial to health, nutrition and Ayurveda industry.

**Molecular Biology Unit, Institute of Medical Sciences of Banaras Hindu University, Varanasi**[7]

The symposium and workshop on “Molecular and Ayurvedic Biology of Inflammation” structured by Molecular Biology Unit of the Institute of Medical Sciences (IMS) in union with the Department of Bioinformatics, Banaras Hindu University (BHU), was held from February 7 to 9, 2014 in Varanasi, India. The occasion was attended by about various scientists, who were from various streams of life-sciences ranging from Molecular Biology to Ayurveda.

Various concept on Ayurveda and their integration with molecular biology and biotechnology were discussed. Prof. Rajavashishth Tripathi, Molecular Biology Unit, IMS, expressed that a better understanding of the inflammatory cells, molecules and mechanisms should result in novel strategies to control the detrimental effects of chronic inflammation and should aid in the development of potential molecular targets to favorably modify inflammatory diseases.

Prof. Bhushan Patwardhan, Interdisciplinary School of Health Sciences, University of Pune, proposed that the knowledge and wisdom of Ayurveda may offer new avenues for biomedical research. He cited several examples to substantiate his claim from relevant areas such as natural product drug discovery, Ayurvedic Biology, Ayu Soft and Ayu Genomics.[8]

Prof. Yamini B. Tripathi of the Department of Medicinal Chemistry, IMS, BHU, while talking on “obesity and inflammation: Modern versus ancient medicine,” voiced that in the
experimental setup it has been shown that several plants that suppress *Vata* have antioxidant and anti-inflammatory potential.\[9\]

Dr. Prafulla K. Tailor, National Institute of Immunology, New Delhi mentioned the role of interferon regulatory factors (Irf) in dendritic cell development and functions. He emphasized the fact that Irf 8 plays a central role in CD8α+ subtype of dendritic cell development.\[10\]

Various Ayurvedic researchers of BHU explained the concepts of Ayurveda like Shat-Kriyakala. Role of medicinal plants from Ayurvedic classics that are useful in shotha (inflammation), Ayurvedic management of inflammation and metabolic syndrome etc.

Others Scientist were discussed on topics like link between epigenetics and inflammation, cecal ligation and puncture, chemotactic mechanisms underlying inflammation etc.

This meeting was a miniature beginning but a positive step toward building stronger bridges between the fields of Molecular Biology and Ayurveda. It also shed a new radiance on the mechanisms promoting and preventing inflammatory diseases. The various topics covered during the sessions were aimed at understanding the inflammatory mechanisms underlying various diseases and at having a better definition of pathways underlying inflammatory conditions, using both Ayurveda and biomedical tools. The workshops on the other hand, focused on the basic skills in bioinformatics to identify various strategies for tackling the detrimental effects of inflammation. They also motivated the participants to look into Ayurveda biology, the understanding of which might be of significant help in this process. Overall, the event proved successful in providing a platform for open-minded discussions among the experts in various fields.

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**REFERENCES**


6. CSIR Ayurgenomics Unit –TRISUTRA @ CSIR-IGIB, New Delhi, http://www.trisutra.in


