



GENETICS IN AYURVEDA: UNRAVELLING ANCIENT WISDOM THROUGH THE LENS OF MODERN GENETICS

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Submitted on- 18-10-23

Revised on- 05-11-23

Accepted on-08-11-23

ABSTRACT:

This article explores the fascinating correlations between *Ayurveda*, the ancient system of medicine, and modern genetics, shedding light on the concept of genetic engineering within the context of this ancient healing tradition. *Ayurveda's* holistic view of human constitution, emphasizing the *Doshas* and individual uniqueness, aligns with modern genetic variations. The notion of *Beejadosha* and *Beejabhaga* reflects the role of genetic inheritance, while *Ayurvedic* principles of lifestyle and environment resonate with epigenetic influences on gene expression. Furthermore, the integration of *Ayurvedic* herbal medicine and dietetics with modern genetic research offers promising avenues for personalized medicine. This study presents a convergence of ancient wisdom and contemporary science, paving the way for a healthier and balanced future.

Keywords: *Ayurveda*, *Beejabhaga*, *Beejadoshas*, Genetics, Epigenetics.

INTRODUCTION:

Ayurveda, often referred to as the "Science of Life," is one of the world's oldest systems of medicine. Rooted in the ancient wisdom of India, *Ayurveda* encompasses a holistic approach to health and well-being, focusing on balancing the mind, body, and spirit. As we delve into the depths of *Ayurvedic* literature, we encounter intriguing correlations with modern concepts of genetics, including the ancient notions of *Beeja*, *Beejabhaga*, and *Beejabhagavyava*, which offer profound insights into genetic engineering within the context of this ancient healing tradition.

AIMS AND OBJECTIVES:

1. To explore the correlation between *Ayurveda* and modern genetics, specifically focusing on the concept of genetic engineering.
2. To highlight the relevance and significance of *Ayurveda* in the context of modern genetic understanding.

MATERIALS AND METHODS:

Literature Review: The primary method employed in this article was a comprehensive literature review of both ancient *Ayurvedic* texts and modern scientific research in the field of genetics, epigenetics, and nutrigenomics. *Ayurvedic* texts such as *Charaka Samhita*, *Sushruta Samhita*, *Ashtanghridaya*, and *Madhavanidana* were

extensively studied to gather relevant *Shlokas* and verses supporting the concepts discussed in the article. Additionally, a systematic review of scientific articles, research papers, and journals was conducted to collect contemporary findings on genetics and its related fields.

Observation:

1. *Ayurveda's* Holistic View of Human Constitution

In *Ayurveda*, each individual is believed to be composed of a unique combination of the five elements i.e the *Panchamahabhuta* viz, *Akash*, *Vayu*, *Jala*, *Agni*, *Prithvi*. These elements in different compositions forms the three *Doshas* - *Vata*, *Pitta*, and *Kapha*, which govern an individual's physical, mental, and emotional characteristics. This elemental and *Doshic* theory is reminiscent of modern genetics' understanding of DNA and genetic variations. All living beings are born with a unique constitution, governed by their individual mental and sensory control. Recognize and worship the Divine presence in all beings.^[1]

2. Genetic Inheritance in *Ayurveda*

Ayurvedic texts emphasise the role of genetics in shaping an individual's health and disease predisposition. The concept of *Beejadosha* (hereditary factors) reflects the idea of genetic inheritance. It highlights how certain diseases or health conditions can be passed down

through family lineages due to shared genetic factors. This notion is in line with modern genetic inheritance patterns and heritability estimates for various health conditions. In *MadhavaNidana*, it is mentioned that a person's health depends primarily on their inherent constitution (*sattva*) and the knowledge of the nature of genes (*Beejakovida*). Understanding the nature of genetic factors in all individuals helps in determining their susceptibility to diseases.^[2]

3. Epigenetics and Ayurveda

Ayurveda recognise the importance of lifestyle and environmental factors in shaping an individual's health. Interestingly, this aligns with the modern concept of epigenetics. Epigenetic modifications can influence gene expression without altering the underlying DNA sequence. Lifestyle choices, diet, stress, and other external factors can impact epigenetic marks, thus affecting gene expression and overall health.^[3] As per *Charaka Samhita*, by considering individual differences and maintaining a balanced lifestyle, disturbances in bodily tissues (*dhatu*s) can be prevented, as the nature of these tissues can be influenced by external factors.^[4]

4. Ayurvedic Herbal Medicine and Genetics

Herbal medicine is central to *Ayurvedic* treatments. *Ayurvedic* texts describe the intricate properties of various medicinal plants

and their therapeutic effects on specific conditions. In the light of modern genetics, researchers have begun to explore the genetic basis of these medicinal properties.^[5] As mentioned in *Sushruta Samhita*, Just as the sun penetrates and energizes the clouds, nutrients, sleep, lifestyle, and strength boost the body tissues and genes, providing robustness to an individual.^[6]

5. Ayurvedic Dietetics and Nutrigenomics

Ayurvedic dietary principles revolve around individual constitution and the balance of *Doshas*. Each person's nutritional requirements are tailored to their unique *Prakriti* and specific health needs. Nutrigenomics, a branch of genetics, examines the interaction between diet and gene expression.^[7] Consuming appropriate food at the right time, considering individual differences, promotes health and happiness, while disregarding such factors can lead to *Dosha* imbalances and discomfort.^[8]

DISCUSSION:

The observation of this article sheds light on the profound connections between *Ayurveda* and modern genetics, underscoring the wisdom of the ancient healing tradition and its relevance in the context of genetic engineering. The article's literature review, encompassing both primary *Ayurvedic* texts and contemporary scientific literature, provides a strong foundation for the

correlation between ancient wisdom and modern understanding.

The alignment of *Ayurvedic* concepts such as *Prakriti*, *Doshas*, and *Beejadosh* with modern genetic variations highlights the insightful understanding of the human constitution that *Ayurveda* has possessed for centuries. In *Ayurveda* it is believed that the *Beeja* quality and quantity both play a very important role in the not only in the genetic predisposition of the individual but it also give rise to various genetic diseases or abnormalities, if they are vitiated. The *Beeja*, *Beejabhaga* and *Beejabhagavyava* are responsible for the genetic diseases and the other chromosomal abnormalities described in both *Ayurveda* and in the modern science. Because *beeja* that is the ovum and the sperm carries the genetic information to the offsprings and if they are vitiated, it leads to *Shukra* and *Shonita Dushti*.^{[9][10]} According to *Charaka*, *Beeja* and *Beejabhaga* are responsible for the formation of various organ in the body and when they are vitiated deformities occurs in the anatomy of only those organs whose responsible *Beejabhaga* is vitiated. If *Beejabhaga* is affected it results into a *Putipraja*.^[11] It possesses chromosomal abnormalities. In modern genetics, chromosomal abnormalities may be numerical (monosomy trisomy etc) or structural (deletion, inversion ring chromosomes, isochromosomes etc) due to

these abnormalities the produced offspring may have a range of anomalies mostly Down Syndrome, Edward syndrome and Patau's Syndrome. When the *Beejabhagavyava* of a male (gene concerning with the female germinating cell) a and female (gene concerning with the female germinating cell) is affected, the offspring will be a *Trinputrika* (predominantly male shaped but not an actual male) and *Varta* (predominantly female shaped but not an actual female) respectively^[11]

The exploration of epigenetics in *Ayurveda* reveals how lifestyle and environmental factors can influence gene expression and overall well-being. This understanding reinforces *Ayurveda's* emphasis on maintaining balance with nature through daily routines and seasonal practices, promoting harmony between the individual and the environment. The integration of *Ayurvedic* herbal medicine and dietetics with modern genetic research opens new possibilities for personalized medicine and nutrigenomics. By recognizing the genetic basis of medicinal properties in herbs and the influence of nutrients on gene expression, *Ayurveda* can offer tailored treatments to optimize health outcomes based on an individual's genetic makeup. *Ayurgenomics* represents a significant advancement in the field of personalized medicine. It combines the

principle of *Ayurveda* and modern genomics which can offer a promising approach to the healthcare that respects an individual's uniqueness and genetic make up. For example, through genetic markers, researchers can identify an individual's *Prakriti* and modify prescription according to their specific needs; doctors can know with the help of Ayurgenomics that how a person's genetic make up and *Prakriti* influences their body's response to the specific herbs and the treatment used. With this knowledge he can customize the medicines and can ensure that the patients receive treatments that are not only effective but also free from adverse reactions. It can drastically improve the treatment outcomes; the knowledge of Ayurgenomics enables a person to analyze a person's *Prakriti* and his genetic susceptibility to a particular disease, like if an individual has a genetic predisposition to diabetes allows for a targeted lifestyle and dietary interventions. Ethical considerations play a crucial role in this discussion, acknowledging the need to approach genetic engineering in *Ayurveda* with respect for the individual's uniqueness and cultural context. By blending ancient wisdom with modern science, the article encourages a balanced and holistic approach to healthcare that embraces both tradition and scientific progress.

CONCLUSION

The ancient *Ayurvedic* concepts of *Beeja*, *Beejabhaga*, and *Beejabhagavyava*, as found in various Ayurvedic literatures, add depth to our exploration of genetic engineering within the context of Ayurveda. These timeless shlokas resonate with modern genetic research, epigenetics, and nutrigenomics, highlighting the holistic approach of *Ayurveda* that cherishes the uniqueness of each individual's genetic makeup and its influence on health and well-being.

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Ayushi Patel, Namrata Tiwari, Dileep Kumar Singh. Genetics in Ayurveda: Unravelling Ancient wisdom through the lens of modern genetics. *Jour. of Ayurveda & Holistic Medicine*, Vol.-XI, Issue-X (Oct. 2023).

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CITE THIS ARTICLE AS

Ayushi Patel, Namrata Tiwari, Dileep Kumar Singh. Genetics in Ayurveda: Unravelling Ancient wisdom through the lens of modern genetics. *J of Ayurveda and Hol Med (JAHM)*.

2023;11(10):84-89

Conflict of interest: None

Source of support: None