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Invited Article

# SCIENTIFIC VALIDATION OF AYURVEDIC CONCEPT OF *PRAKRITI* (PSYCHO-SOMATIC CONSTITUTION) - CURRENT EVIDENCES

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**KEYWORDS:** Ayurveda, *Prakriti*, Scientific validation, Ayugenomics.

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**ABSTRACT**

Ayurveda is an ancient Indian healing system with personalized approach documented and practiced since ages. Ayurveda is not merely a system of medicine, in a broader sense it is the "Science of Holistic Living and Art of Natural Healing". Ayurveda has a unique way of classifying human population based on individual constitution or *Prakriti*. Ayurveda's *Tridosha* theory identifies principles of movement (*Vata*), metabolism (*Pitta*), and structure (*Kapha*) as discrete phenotypic groupings. As per this system, every individual is born with his or her own basic constitution, which to a great extent regulates inter-individual variability in susceptibility to diseases and response to external environment, diet and drugs. In the realm of modern predictive medicine, efforts are being directed towards capturing disease phenotypes with greater precision for successful identification of markers for prospective disease conditions. Due to contemporary technological advancements, newer approaches are emerging in different sciences which are beyond their frontiers, of which Precision medicine is newer one. It is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. It seems to be the continuation or advancement of personalized predictive medicine. In this context different study discussed in the article provides the identification of a genomic link to the theory of *Prakriti* led to a search for possible classification of people on their *Prakriti* based on their genetic makeup. These studies could eventually lead to a personalization of medical practice on the basis of *Prakriti* as is conceived in Ayurveda. This reappraisal of Ayurveda in light of fundamental science and its advances would be immensely helpful to perceive Ayurveda in true scientific fervor.

## Introduction

Ayurveda teaches us the science of life from a micro to a macro level. Therefore It conceptualised with concrete fundamental theories, begins with the theory of evolution of the universe (*Brahmanda*) with the entire life forms (*Pinda*) prevailing in it (including human beings, plants, animals and microbes etc.), supported with non living components like soil, water, minerals and metals. According to Ayurveda, all the living and non-living things are made up of the five elementary principles (*Panchamahabhuta*) which are derived from the three effective principles/energies of nature (*Prakriti*).(1)

## Concept of *Prakriti*

*"It's far more important to know what person has the disease than what disease the person has" (Hippocrates)*

*"Every individual is different from another and hence should be considered as a different entity. As many variations are there in the universe, all are seen in human beings." (Charaka)*

This dictum of Ayurveda said by Acharya Charaka is the fundamental to the concept of *Prakriti*. Etymologically *Prakriti* (*pra* = primary or first, *Kriti* = formation or creation) stands for the prototype representing the basic formative distinction in a given individual i.e., natural predisposition. Proportions of *Tridosha* are determined genetically (*Shukra Shonita*) and are influenced by the environmental factors (maternal diet, lifestyle) during development. Ethnicity (*Jatiprasakta*), familial characteristics (*Kulanupatini*), and geoclimatic regions (*Deshanupatini*) are known to influence the phenotypic variability.

Constitutional type of an individual or *Prakriti* is the basic clinical denominator in Ayurveda. It is described to be formed of characteristic physiological, physical and mental features of an individual, and is

classified into subgroups depending on specific *Dosha* predominance. Seven subgroups of *Prakriti* are possible representing a differential combination or equi-presence of each one of the *Tridosha*, namely *Vata*, *Pitta* and *Kapha*. Knowledge of the basic *Prakriti* of a person is useful to stay in a state of positive health and prevent disease. The large number of phenotype description by *Prakriti* determination is based on the knowledge and experience of the assessor, and hence subject to inherent variations and interpretations.

***Concept of Prakriti* – Ayurgenomics**

Ayurgenomics is an integrative approach of Ayurveda and Genomics for discovery of predictive markers for preventive and personalized medicine. CSIR has established TRISUTRA (**T**ranslational **R**esearch and **I**nnovative **S**cience **T**hrough **A**yurgenomics) at Institute of Genomics and Integrative Biology (IGIB), Delhi with a mission to develop affordable health care solutions based on traditional knowledge of Ayurveda, knowledge of modern genomics and modern medicine. The main activity is to conduct research aimed at providing scientific credence and global acceptability to Ayurveda, new leads to genomics, create interdisciplinary expertise in the area and build resources for Ayurgenomics.

**Literature search methods**

The search was done using PubMed, Google Scholar and Google. We used the following search strings: Ayurveda, Ayurved, Scientific validation of Ayurveda, *Prakriti*, *Ayurvedic prakriti*, Ayurvedic constitutional types, Psychosomatic constitution in Ayurveda, Ayugenomics, and Ayurgenomics No limits were set in order to retrieve a maximum number of articles. Major points of research outcomes were discussed and detailed below in a chronological order.

**Current evidences on the concept of *Prakriti***

1. Twenty eight patients undergoing treatment for Cancer and 57 normal adults are studied for their *Prakriti* (constitution and temperament) to find out whether there is any difference in the *Prakriti* pattern of Cancer patients when compared with that of normal volunteers. *Pitta* dominance is found in the *Prakriti* pattern of Cancer patients followed by *Kapha* dominance.(2)
2. Features representing *Prakriti* subtypes as per their *Dosha* specification have also been attempted for their statistical validation. (3)
3. Researchers have tried to identify the inheritance possibilities of human *Prakriti* by observing positive correlations between specific alleles and *Prakriti* sub-types. It was observed a reasonable correlation between HLA type and *Prakriti* type. The complete absence of the HLA DRB1*02 allele in the *Vata* type and of HLA DRB1*13 in the *Kapha* type are significant, with X2 = 4.715 and p<0.05. HLA DRB1*10 had higher allele frequency in the *Kapha* type than in the *Pitta* and *Vata* types. (4)
4. The findings of a genetic basis for both Ayurvedic and TCM classifications indicate a commonality between Asia's great medical traditions in their diagnostic typologies and a genetic basis for Asian traditional medicine's theory of discrete and discernable groupings of psycho-physiologic differences. Accordingly, new horizons have opened for collaborative East-East research and for an individualized approach to disease management and activation of the full range of human potential, as articulated in Ayurveda and TCM. (5)
5. Individuals from the three most contrasting constitutional types exhibit striking differences with respect to biochemical and hematological parameters and at genome wide expression levels. Biochemical profiles like liver function tests, lipid profiles, and hematological parameters like haemoglobin exhibited differences between *Prakriti* types. Functional categories of genes showing differential expression among *Prakriti* types were significantly enriched in core biological processes like transport, regulation of cyclin dependent protein kinase activity, immune response and regulation of blood coagulation. A significant enrichment of housekeeping, disease related and hub genes were observed in these extreme constitution types. Ayurveda based method of phenotypic classification of extreme constitutional types allows to uncover genes that may contribute to system level differences in normal individuals which could lead to differential disease predisposition. This attempt is an unraveling the clinical phenotyping principle of a traditional system of medicine in terms of modern biology. An integration of Ayurveda with genomics holds potential and promise for future predictive medicine. (6)
6. EGLN1 was one among 251 differentially expressed genes between the *Prakriti* types. In this study, it was reported a link between high-altitude adaptation and common variations rs479200 (C/T) and rs480902 (T/C) in the EGLN1 gene. Furthermore, the TT genotype of rs479200, which was more frequent in *Kapha* types and correlated with higher expression of EGLN1, was associated with patients suffering from high-altitude pulmonary edema, whereas it was present at a significantly lower frequency in *Pitta* and nearly absent in natives of high altitude. Analysis of Human Genome Diversity Panel-Centre d'Etude du Polymorphisme Humain (HGDP-CEPH) and Indian Genome Variation Consortium panels showed that disparate genetic lineages at high altitudes share the same ancestral allele (T) of rs480902 that is overrepresented in *Pitta* and positively correlated with altitude globally (P < 0.001), including in India. Thus, EGLN1 polymorphisms are associated with high-altitude adaptation, and a genotype rare in highlanders but overrepresented in a subgroup of normal lowlanders discernable by Ayurveda may confer increased risk for high-altitude pulmonary edema. (7)
7. The descriptions in Ayurveda indicate that individuals with *Pitta Prakriti* are fast metabolizers while those of *Kapha Prakriti* are slow metabolizers. Researchers hypothesized that different *Prakriti* may have

different drug metabolism rates associated with drug metabolizing enzyme (DME) polymorphism. With this background a correlation between CYP2C19 genotype and *Prakriti* with fast and slow metabolic features have been attempted. CYP2C19 (Phase I DME) genotyping in 132 unrelated healthy subjects of either sex by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique was done. It was observed significant association between CYP2C19 genotype and major classes of *Prakriti* types. The extensive metabolizer (EM) genotype (∗1/∗1, ∗1/∗2, ∗1/∗3) was found to be predominant in *Pitta Prakriti* (91%). Genotype (∗1/∗3) specific for EM group was present only in *Pitta Prakriti.* Poor metabolizer (PM) genotype (∗2/∗2, ∗2/∗3, ∗3/∗3) was highest (31%) in *Kapha Prakriti* when compared with *Vata* (12%) and *Pitta Prakriti* (9%). Genotype (∗2/∗3) which is typical for PM group was significant in *Kapha Prakriti* (odds ratio = 3.5, P = .008). It was found interesting correlations between CYP2C19 genotypes and *Prakriti* with fast and slow metabolism being one of the major distinguishing and differentiating characteristics. These observations are likely to have significant impact on phenotype-genotype correlation, drug discovery, pharmacogenomics and personalized medicine. (8)

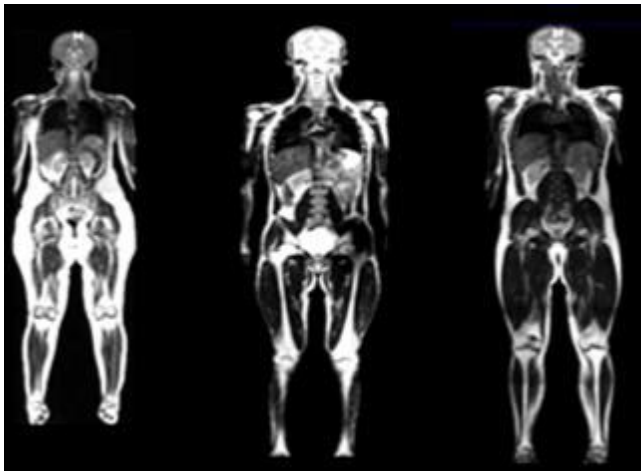
8. The concept of personalized medicine has been around for as long as people have been practicing medicine. From Charaka to Hippocrates, all have practiced the personalized approach for treating a disease. In the 21st century, personalized medicine is all about DNA. Whereas the single nucleotide polymorphism (SNP) and epigenetic factors influence drug response and form the basis of personalized medicine, the *Tridosha* theory forms the basis of *Prakriti*-based medicine. With effective integration of 'omics' *Prakriti*-based medicine can play a vital role in this changing scenario of global health wisdom as Ayurveda offers its modalities by way of *Ahara* (diet), *Vihara* (lifestyle), and *Aushadhi* (medication), which are the three pillars of *Prakriti*-based medicine making it a holistic science. *Prakriti*-based medicine and other traditional medicine systems have the potential to offer remedies to the challenging health issues like adverse drug reactions, drug withdrawals, and economic disparities among few. An integrative global approach could do wonders to health sciences benefiting a broad spectrum of patients. (9)
9. Three basic extreme genopsycho-somatotypes or birth constitutions are enunciated: mesomorphic or andrus (*Pitta*), endomorphic or thymus (*Kapha*), and ectomorphic or thyrus (*Vata*). The method further predicts that male andrus constitution across races shares similarities in androgen (An) nuclear receptor behavior, whereas thymus constitutions are mainly regulated by T-cells (Tc) nuclear receptor behavior. Moreover, it suggests that thyrus constitutions share similarities in thyroxine (Th) nuclear receptor behavior. These proposed nuclear receptors are expected to regulate the expression of specific genes, thereby controlling the embryonic development, adult homeostasis, and metabolism of the human organism in a very profound way. The method finally predicts small differences in measured property (An, Tc, and Th nuclear receptors behavior) within a birth constitution across different races to be expected by modulation effects in melanocyte-stimulating hormone receptor behavior. (10)
10. Researchers hypothesized that conditioning association studies on prior risk, predictable in Ayurveda, will uncover much more variance and potentially open up more predictive health. In the present case-control study, it was attempted to address this issue of phenotypic heterogeneity by using a method of classification of study subjects based on *Prakriti* as described in Ayurveda, and taking RA as a disease model. Results obtained seem to be promising. Total of 300 *Amavata* (RA) patients and 300 healthy controls were recruited, with a 100 each of *Vata, Pitta* and *Kapha* predominant *Prakriti* in this exploratory study on Ayurgenomics. However, it was observed by the clinical team and supported by demographic data that there was an excess of RA patients with *Pitta* predominant *Prakriti* and considerably lower number with *Vata* and *Kapha* constitutions. It was observed that RA in *Vata* subgroup patients is unique in its association with CD40 and RA in *Pitta* subgroup with PON1 and SOD3 (rs699473). These observations reiterate that subgrouping of individuals, based on *Prakriti*, may be useful in underpinning some of the masked associations (like CD40, which was not seen in total case-control analysis), by overcoming the major limitation of sample heterogeneity. It was also established that *Pitta* and *Vata Prakriti* groups differ with respect to inflammatory and oxidative stress pathways. The preliminary results of varying disease characteristics in the three specific subgroups as well as different pathway genes being associated in the subgroups, is suggestive that RA in *Vata* subgroup is mediated by inflammatory genes where as in the *Pitta* subgroup, oxidative stress genes seem to be major determinants. Our results seem to support the common knowledge of varying contribution of genes of minor effect to the complex disease phenotype in different individuals. Further, it supports our hypothesis that conditioning association studies on prior risk will uncover much more variance and potentially open up more predictive health. They may besides supporting personalized drug regimen, also provide useful leads for enhanced understanding of the existence and differential contribution of multiple pathways in the pathogenesis/biology of a disease. Their usefulness in building meaningful disease networks especially with the enormous amount of data being generated by the GWAS approach in complex traits cannot be undermined. It was concluded that this exploratory study employing the novel combinatorial ayurgenomics approach has supported the hypothesis that sub grouping of

patients based on *Prakriti* may help overcome the current limitation of phenotypic heterogeneity which is hampering the progress in complex trait genetics research. (11)

11. The study was intended to assess the association of constitutional types (*Prakriti*) with cardiovascular risk factors, inflammatory markers and insulin resistance in subjects with coronary artery disease (CAD). Three hundred patients with CAD >25 years were studied. Assessment of *Prakriti* was done by using Ayusoft software. Biochemical parameters, inflammatory markers (hsCRP, TNF-alpha and IL-6) and insulin resistance (HOMA-IR) were measured. Mean age of patients was 60.97±12.5 years. Triglyceride, VLDL and LDL was significantly higher ($P<0.0001$, $P<0.0001$ and 0.0355, respectively) and HDL cholesterol ($P<0.0001$) significantly lower in *Vatta kapha* (VK) *Prakriti* when compared with other constitution type. VK *Prakriti* was correlated with diabetes mellitus ($r=0.169$, $P=0.003$), hypertension ($r=0.211$, $P\leq0.0001$) and dyslipidemia ($r=0.541$, $P\leq0.0001$). Inflammatory markers; IL6, TNF alpha, hsCRP and HOMA IR was highest in VK *Prakriti*. Inflammatory markers were correlated positively with both VK and *Kapha* group. Study found that there is strong relation of risk factors (diabetes, hypertension, dyslipidemia), insulin resistance, and inflammatory markers with *Vata Kapha* and *Kapha Prakriti*. (12)
12. It was observed that in a study population of normal healthy participants (n= 137), ADP-induced maximal platelet aggregation (MPA) was highest among the *Vata-pitta prakriti* individuals [Median (range), 83.33% (52.33-96)] as compared to the other *Prakriti* types and these individuals responded better to lower dose of aspirin compared to other *Prakriti* types. Results suggest that identifying the *Prakriti* may help in individualising therapy or predicting proneness to a disease. (13)
13. Researchers showed a correlation between having *Vata Prakriti* and an increased risk for developing Parkinson disease. (14)
14. Human variations related to immune response and disease susceptibility is well-documented in Ayurveda. *Prakriti* (body constitution) is the basic constitution of an individual established at the time of birth and distinguishes variations, into three broad phenotype categories such as *Vata*, *Pitta* and *Kapha*. Variation in immune response is often attributed to and measured from the difference in cluster differentiation (CD) markers expressed in lymphocytes. Pilot study performed to evaluate a panel of lymphocyte subset CD markers in dominant *Prakriti* individuals. It was observed a significant difference ($P < 0.05$) in the expression of CD markers such as CD14 (monocytes), CD25 (activated B cells) and CD56 (Natural killer cells) between different *Prakriti* groups. CD25 and CD56 expression was significantly higher in *Kapha prakriti* samples than other *Prakriti* groups. Similarly, slightly higher levels of CD14 were observed in *Pitta prakriti* samples. Significant difference in the expression of CD14, CD25 and CD56 markers between three different *Prakriti* is demonstrated. The increased level of CD25 and CD56 in *Kapha prakriti* may indicate ability to elicit better immune response, which is in conformity with textual references in Ayurveda. (15)
15. It can be envisaged that in future newborns can be screened for various *Prakriti* types which will open up possibilities of creating lifestyles and environments that lead to prevention of diseases that particular *Prakriti* types are prone to. This takes the concept of personalized medicine further and enters the arena of personalized preventive health or personalized preventive medicine. Such personalized preventive health will result in healthy and more productive lives for such children, which has also the potential to reduce the burden of disease as well as increasing costs faced by health systems due to rising incidence of chronic diseases. (16)
16. Researchers attempted to relate dominant *Prakriti* attribute to body mass index (BMI) of individuals by assessing an acceptable tool to provide the quantitative measure to the currently qualitative *Ayurvedic prakriti* determination. It was found 80% concordance between Ayurvedic physician and software in predicting the *Prakriti* of an individual. The kappa value of 0.77 showed moderate agreement in *Prakriti* assessment. We observed significant correlations of dominant *Prakriti* to place of birth and BMI with Chi-square, $P < 0.01$ (Cramer's V-value of 0.156 and 0.368, respectively). The present study attempts to integrate knowledge of traditional Ayurvedic concepts with the contemporary science. It was demonstrated analysis of *Prakriti* classification and its association with BMI and place of birth with the implications to one of the ways for human classification. (17)
17. Ayurgenomics, an integration of the principles of Ayurveda with genomics, plays a vital role in explaining how current drugs can be used more effectively by targeting them on patients of particular *Prakriti*. The principle of Ayurgenomics seems to bear similarities with that of pharmacogenetics/ pharmacogenomics and exhibits the potential to serve as a platform in achieving the concept of personalized drug therapy. The basis of individual variations in Ayurveda indicates that the individuals of different *Prakriti* may have different rates of drug metabolism associated with drug metabolizing enzyme (DME) polymorphism as well. The current limitation of clinical heterogeneity in molecular genetic analysis of complex traits can be overcome by *Prakriti*. It can serve as a tool to sub-group both healthy and diseased individuals. (18)
18. Majority of the *Vata* predominant patients had developed IBS-Constipation; *Pitta* predominant patients had developed IBS-Diarrhoea. Quality of Life (QOL) was better in *Pitta* predominant individuals of all IBS-disease subtypes. With this, it was found that

*Prakṛti* examination in IBS helps in detecting the proneness of developing an IBS subtype and predicting their QOL accordingly. (19)

19. DNA methylation and its perturbations are an established attribute to a wide spectrum of phenotypic variations and disease conditions. Researchers attempted to establish DNA methylation differences in these three *Prakriti* phenotypes. whole blood DNA of 147 healthy male individuals belonging to defined *Prakriti* (*Vata*, *Pitta* and *Kapha*) between the age group of 20-30years were subjected to methylated DNA immunoprecipitation (MeDIP) and microarray analysis. After data analysis, *Prakriti* specific signatures were validated through bisulfite DNA sequencing. Phenotypes characterized by higher metabolism (*Pitta prakriti*) in individuals showed distinct promoter (34) and gene body methylation (204), followed by *Vata prakriti* which correlates to motion showed DNA methylation in 52 promoters and 139 CpG islands and finally individuals with structural attributes (*Kapha prakriti*) with 23 and 19 promoters and CpG islands respectively. Bisulfite DNA sequencing of *Prakriti* specific multiple CpG sites in promoters and 5'-UTR such as; LHX1 (*Vata prakriti*), SOX11 (*Pitta prakriti*) and CDH22 (*Kapha prakriti*) were validated. *Kapha prakriti* specific CDH22 5'-UTR CpG methylation was also found to be associated with higher body mass index (BMI). Differential DNA methylation signatures in three distinct *Prakriti* phenotypes demonstrate the epigenetic basis of Indian traditional human classification which may have relevance to personalized medicine. (20)
20. Significant differences in allele frequencies were observed in seven genes (SPTA1, VWF, OLR1, UCP2, OR6K3, LEPR, and OR10Z1) after FDR correction ($P<0.05$). A non synonymous variation (C/T, rs1063856) associated with thrombosis/bleeding susceptibility respectively, differed significantly between *Kapha* (C-allele) and *Pitta* (T-allele) constitution types. A combination of derived EGLN1 allele (HAPE associated) and ancestral VWF allele (thrombosis associated) was significantly high in *Kapha* group compared to *Pitta* ($p < 10(-5)$. The combination of risk-associated *Kapha* alleles was nearly absent in natives of high altitude. Inhibition of EGLN1 using (DHB) and an EGLN1 specific siRNA in a mouse model lead to a marked increase in vWF levels as well as pro-thrombotic phenotype viz. reduced bleeding time and enhanced platelet count and activation. It was demonstrated for the first time a genetic link between EGLN1 and VWF in a constitution specific manner which could modulate thrombosis/bleeding susceptibility and outcomes of hypoxia. Integration of *Prakriti* in population stratification may help assemble common variations in key physiological axes that confers differences in disease occurrence and patho-phenotypic outcomes. (21)
21. MRI provides the much needed scientific validation and objective parameters for some of the Ayurvedic physical phenotyping indices like regional / whole body fat and water distribution. (22)



Whole body MR images: differences in fat distribution corresponding to the Ayurvedic phenotypes of V, P and K. Source: Rama Jayasundar. Expanding the role of NMR beyond its traditional boundaries. Available online

**Scientific validation & Issues**

The Oxford Dictionary defines validation as "to check or prove the validity or accuracy of..." or "to demonstrate or support the truth or value of..."

The validity of one knowledge system must be confirmed by another raises issues over the equity of such an approach. Indigenous knowledge systems need no validation by western knowledge systems because they have proved their validity by supporting communities for thousands of years (Michell 2005). As Williams (2009:168) notes: "indigenous people worldwide commonly believe that their traditional knowledge is superior to scientific knowledge because it is meaningful to them and it works." Hence, the relative positions of knowledge holders toward alternative knowledge systems may further inhibit the dialogue necessary for the integration. Consequently, there is a need to develop spaces where holders of different knowledge systems can develop a respectful and equitable dialogue on how to mutually validate and integrate their knowledge for effective utilization by the all.

*// Ekam shastram adhiyano na vidyat shastranishchaya|*
*Tasmat bahushrut shastro vijaniyat chikitsakah //*
(Su.Su 4/7)

One who knows only one *Shastra* cannot come to any decisive conclusion. That is why one who has learnt from many *Shastras* is indeed a physician. *Acharya Susruta*, who is considered to be Father of Ancient Surgery, have not limited the scope of this science and opined to make up gradations according to the needs and challenges of the current times. For a renaissance in Ayurveda, we need to remember and apply the aforesaid sutra also to new sciences, which have emerged over the last three centuries. The global impact and importance of Ayurveda, just like yoga, will be spontaneous when unique principles, practices, and products of Ayurveda are understandable in terms of the current life sciences.

**Discussion and Conclusion**

After analyzing the many research and review articles; the potentials of *Prakriti*-based medicine can be applied in different areas of healthcare such as Promotion of health and quality of life and thereby longevity, Personalised prevention of diseases, Understanding patient needs and risk factors for various chronic conditions, Personalizing health care by monitoring *Ahara*, *Vihara*, and *Aushadhi* on individual basis, Individualized disease management, Reduction in morbidity and mortality, Provision of new approaches for diagnosis and drug development, Reducing the trial and error approach of health care system, Minimizing adverse drug reactions, Making healthcare affordable for people of various economic strata, To utilize appropriate technologies for development of single and polyherbal products to make it globally acceptable etc.,(23)

Human *Prakriti* has a diverse application in the field of diagnosis, epidemiology, clinical decision-making, and prognostication. Ayurvedic concept of *Prakriti* received a thorough review recently through number of evidences arising from statistics, gene science, and biochemistry. (22) Further studies on concept of *Prakriti*, using larger and more diverse population samples in conjunction with other physiological and genomic parameters are expected to provide better and rational understanding of the "traditional wisdom".(24)

Twenty first century has witnessed many landmark observations, which have added to the scientific credentials of Ayurveda. In the 21st century paradigm of personalized medicinal approach, the Ayurveda can certainly find its place, for now as complementary, but maybe as a side to side, or even first choice therapeutic step when comparing it to conventional medicine. There ought to be more good quality clinical studies done in order for it to get worldwide acclamation and integration. (25)

It is however believed that instead of a retrospective approach of looking into the Ayurveda through the scientific reappraisals, a prospective approach through primary understanding of Ayurveda followed by a search into scientific linkage would be more appealing.(26-27) Concept of *Prakriti* can also be interlinked to the concept of *Pathyapathya* i.e., Dietetics and therapeutic nutrition, which may be termed as 'Ayurnutrigenomics'.(28) Concept of *Prakriti* also to be studied with respect to *Sara* (*Dhatu* essence) typology, which may provide scientific knowledge inputs to the ongoing Precision medicine initiative.

India is a country rich in culture and tradition. Ayurveda has a continuity of tradition spanning many centuries, cannot be reason enough for its authenticity and its acceptance as a whole. Ayurveda needs science and evidence based methods for validation and global approval. There is a need for amalgamation of related sciences to provide healthcare to all segments of population. Governments should support cooperation between holders of traditional knowledge and scientists to explore the relationships between different knowledge systems and to foster interlinkages for mutual benefit."

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