

Modern Human Genetic Meets Traditional Medicine. New Opportunities?

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It is an interesting time when modern science may validate aspects of ancient approaches to health care. Nowadays, this might be the case for Ayurveda, the most ancient system of medicine (dated 3500 B.C.) [1]. Originally from India, it is widely practiced in that country and is rapidly spreading all over the world as a natural system for health care.

Ayurveda has one of its main foundations in the universal concept of prakriti ("nature"), that represents, in regards to the human being, its psycho-physical constitution, more finely sub-defined by the tridosha theory into the three doshas Vata, Pitta and Kapha. Each of these doshas represents a different aspect of an individual's constitution, physiological functions and organic regulations that remain somewhat permanent during human lifetime. Recent evidence has emerged connecting the concepts of the prakriti with genotypes, metabolic pathways and their association with physiological functions and disease predisposition. It has thus been proposed that this birth constitution is programmed in the person's DNA.

The modern acceptance of the DNA-based concepts of personalized medicine and disease predisposition as main issues for future developments in the science of health, appears to have convenient links with the concept of prakriti: distinct phenotypes (prakriti) on the bases of distinct genotypes (genetics). The recent availability of the omics-technologies amped up research into these concepts and highlighted elements of possible shared utility between modern medicine and Ayurveda. The application of systems biology tools to the study of prakritis representing certain genotypes, seems to reveal differences at the level of the expression of genes known to play roles in disease predisposition and progression such as hub genes and genes enriched in core biological processes like transport, regulation of protein kinases activity and immune response [2]. At genetic level a

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couple of pioneering works showed that analysis of individuals phenotypised using a Prakriti-based approach, could uncover genetic variations that are associated with adaptation to external environment [3] and susceptibility to diseases [4].

Beyond hypothesizing that such discoveries propose new integrated approaches to a more personalised health care, in clinical research a novel combinatorial "ayur-genomics" approach seems to offer quite convenient opportunities to capture variability among individuals. This might be important to overcome sample/clinical heterogeneity, which is undoubtedly a major limitation in the identification of genetic determinants underlying common complex traits. In conclusion, this groundbreaking approach shows all the elements to encourage deeper studies into the adoption of the prakriti concept for an optimised design of costly clinical trials aimed at unravelling constitution-disease predisposition correlates and intervention strategies.

References

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