



# Ayurveda & Yoga

## Holistic Sciences of Mind, Body and Spirit

Bhushan Patwardhan, PhD, FAMS

Interdisciplinary School of Health Sciences

University of Pune

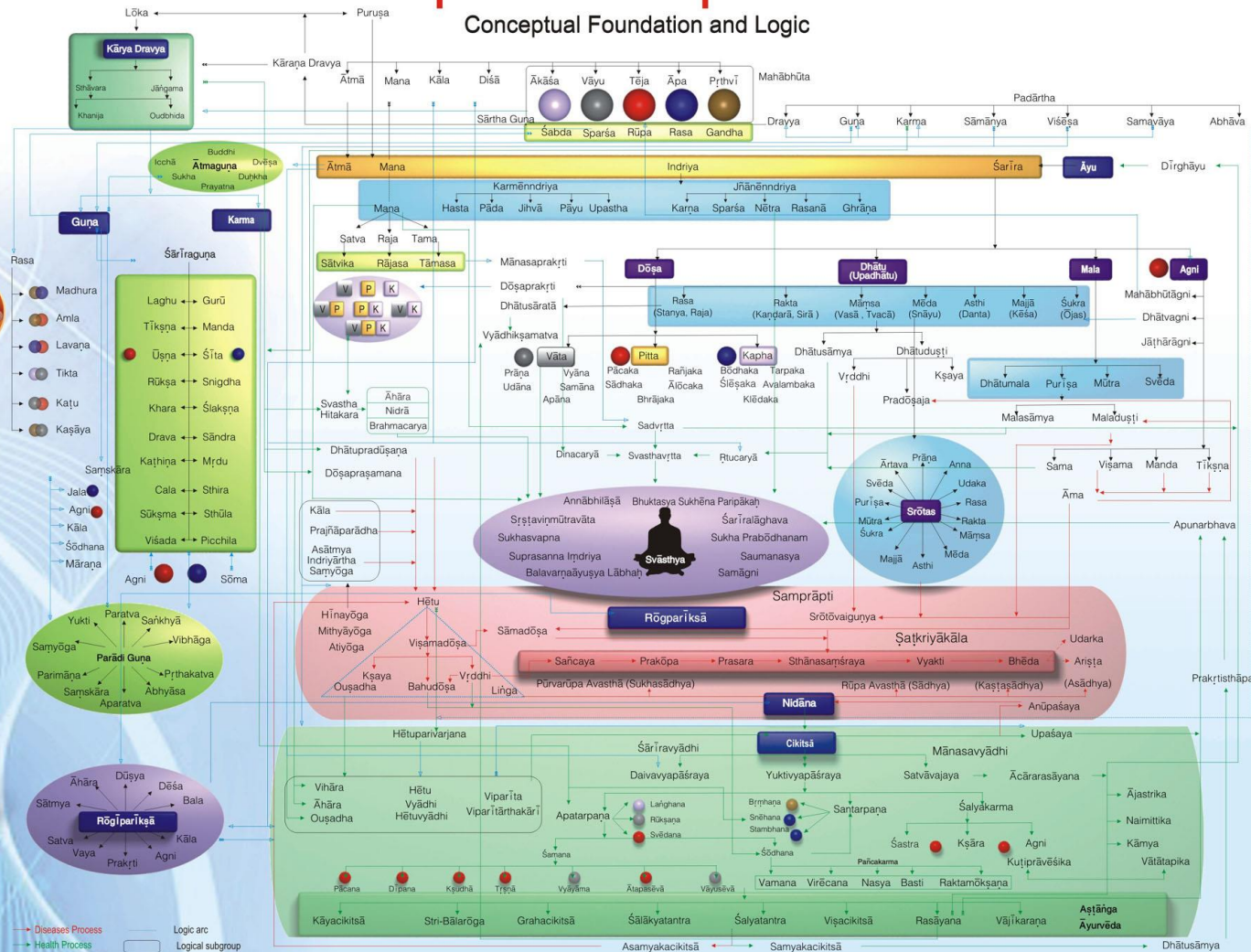
Ancient Indian Wisdom Conference, Deccan College Pune

December 7, 2013

# Systems Āyurvēda®

## Conceptual Foundation and Logic

Created by  
Girish Tilkur,  
G.G. Gangadharan,  
Ashok D.B. Vaidya &  
Bhushan Patwardhan<sup>d</sup>



### About this Poster

This 'Systems Āyurvēda' graphic notation describes scheme of Āyurvēda knowledge base. Comprehensive view of concepts and logic is possible through this approach. In addition to logical, sequential linear flow, Āyurvēda also adopts multi-dimensional, one-to-many and many-to-many cause effect relations. We hope the forthcoming poster series on 'Systems Āyurvēda' will illustrate potential and practical applications of logic and vast knowledge base of Āyurvēda.

'Systems Āyurvēda' is an entity relationship notation based on Systems Biology Graphical Notation (SBGN) concept<sup>a</sup>. This first poster broadly describes logical flow, forward loops, backward loops, entity relations and their applications in health and diseases. The foundations and logic of Āyurvēda is mainly based on Sāhitya and Vaiśāḍika philosophy. According to this, every matter (Prakṛti) is composed of five primordial elements (Mahābhūta). The manifested parts of matter are microcosm (the living) and macrocosm (universe), both could be assessed by similar logic and method. Main aim of Āyurvēda is to promote health, longevity and alleviate diseases. This is achieved through homeostasis of Dōṣa, Dhātu, Mala and Āgni. Appropriate conduct including proper lifestyle and leads to health. Ethics of Dravya or diet, drug also acts as causative factor depends on properties and activities relative to the context. The processing (Srotas) enables augmentation of health promoting properties and reducing toxicity of medicines. The disease process initiates from causative factors (Hētu) and any disturbance in organs (e.g. Dhātu). The Sampṛāpti is process through several steps (Sāhitya) and manifests into disease. The holistic approach of Āyurvēda management aims at establishing health through multifarious treatment modalities including counselling, avoiding causes, Prāyāsana, medicines, diet and surgical procedures. Every aspect of 'Systems Āyurvēda' logic is linked to other components and has specific role in maintenance of health and/or treating diseases. The 'whole to part' notion of Āyurvēda philosophy is important for better understanding of comprehensive account. The immense data consisting of near 300 variables describing logical flow and concepts of Āyurvēda have been presented using SBGN approach for processes, entity relationships and activity flow.

<sup>a</sup> Niviere N. L. et al. Systems Biology Graphical Notation. Nature Biotechnology 2008, 27, 705–741. (We thankfully acknowledge suggestions and inputs from Dr. Vias Nand, Dr. Venugopal, Dr. Vivek Shankar, Dr. Girish Tilkur, Dr. Prasad and Dr. Sanjeev Gubli.)

### Legends:

- Śarīra
- Guṇa
- Svāsthya
- Sampṛāpti
- Śaṅkṛiyākāla
- Ciktisā
- Aṣṭāṅga Āyurvēda

a. Center for Development of Advanced Computing, Pune  
b. Foundation for Rehabilitation of Local Health Traditions, Bangalore  
c. Kasturba Health Society - Medical Research Centre, Mumbai  
d. Interdisciplinary School of Health Sciences, University of Pune



# Ayurveda: Strengths

- Over 4000 years of living great tradition
- Strong philosophical basis
- A complete and holistic system
- Well organized knowledge database
- Proven safety
- Powerful engine for Bioprospecting

# Ayurveda: Weaknesses

- Lacks correct and contemporary interpretations
- Research stagnancy
- Poor standardization
- Raw material authenticity and availability
- Lack of focused research
- Poor technology integration
- Poor global presence

# Ayurveda: Opportunities

- Growing global market
- Renewed global interest in CAM
- Availability of new technologies
- Provide new leads
- Personalized medicine

# Ayurveda: Threats

- Poor positioning on a global level
- Ignored by the global scientific community
- Very little scientific research validations
- Very little publications in peer-reviewed science Journals
- Inadequate QC

# Ayurveda & Yoga:

Holistic Sciences of Mind, Body and Spirit

## The Body

100 trillion cells, 4 basic tissues, 206 bones.....

Health is not just absence of disease...

Prasanna Atmendriya Manha!

# Ayurvedic Therapeutics:

## Main Variables

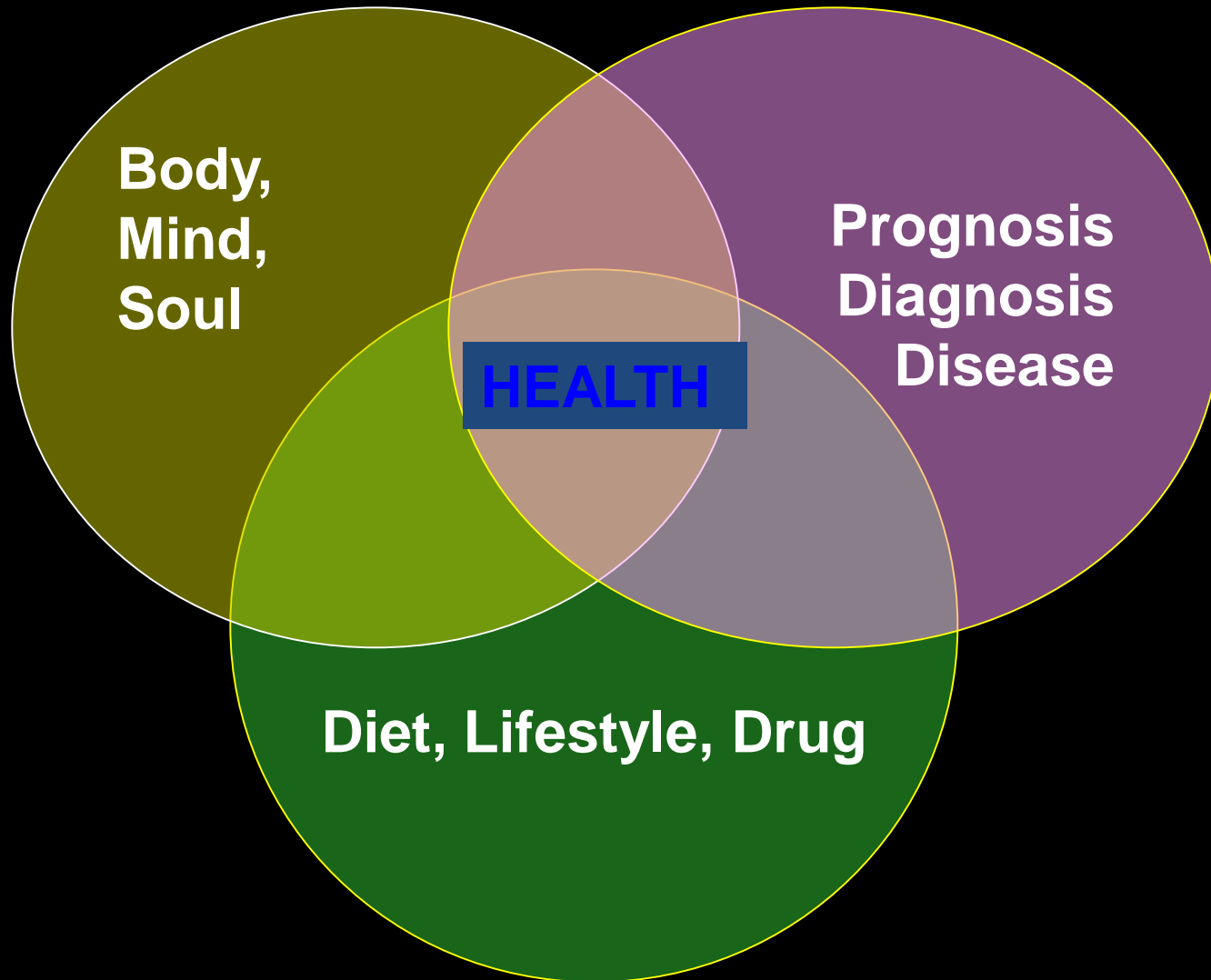
- Mahabutas (5)
- Doshas (3)
- Dushti (2)
- Dhatus (7)
- Mala (3)
- Agni (13)
- Srotas (13)
- Dravya (>>700)
- Guna/properties (20)
- Rasa (6)
- Virya (2)
- Vipak (3)
- Prabhav
- Desh, Dushya,
- Bala, Kala

The permutations of these variables make every person a unique entity.

9/30/2015

ancient wisdom

# Knowledge base in Ayurveda



# AyuSoft to AyuGenomics

A systems approach to new  
generation Technology Platform for  
future medicine

स्वस्थश्च प्रकृतिभेदेन नानाप्रकारः ।अतः तेषां हितमपि नानाप्रकारमेव ॥

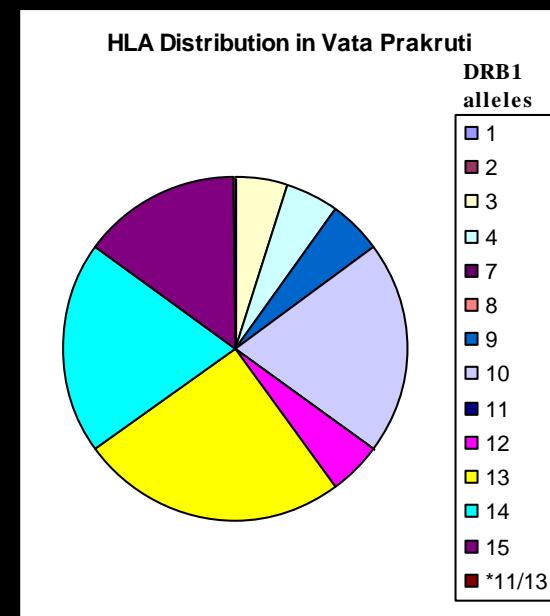
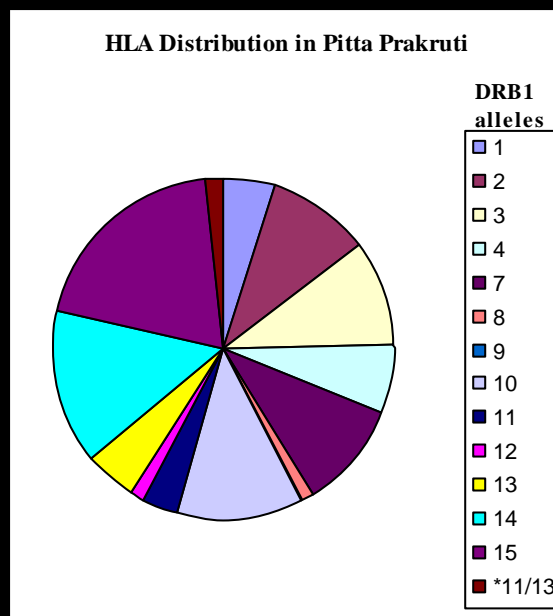
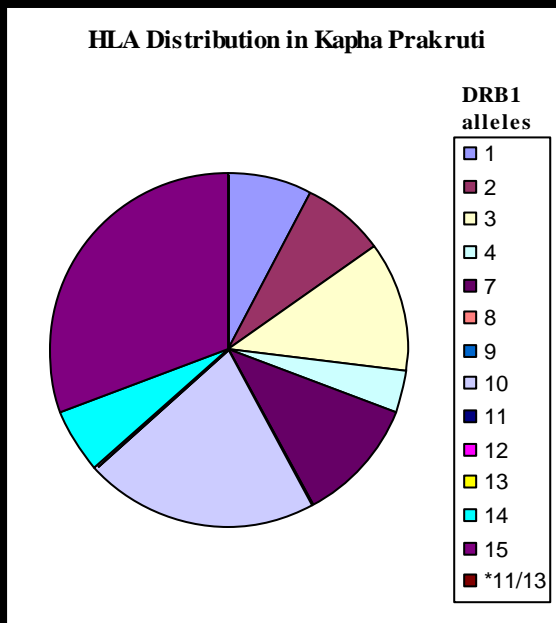


*“Every individual is different from another and hence should be considered as a different entity. As many variations are there in the Universe, all are seen in Human being”..... Charak Samhita*

**Ayurveda: Prakriti has genetic basis?**

# Classification of human population based on Ayurvedic concept of *Prakriti* (n=76)

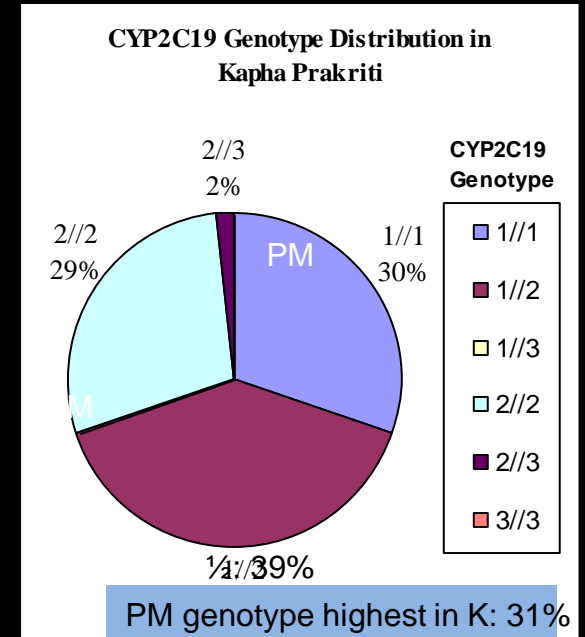
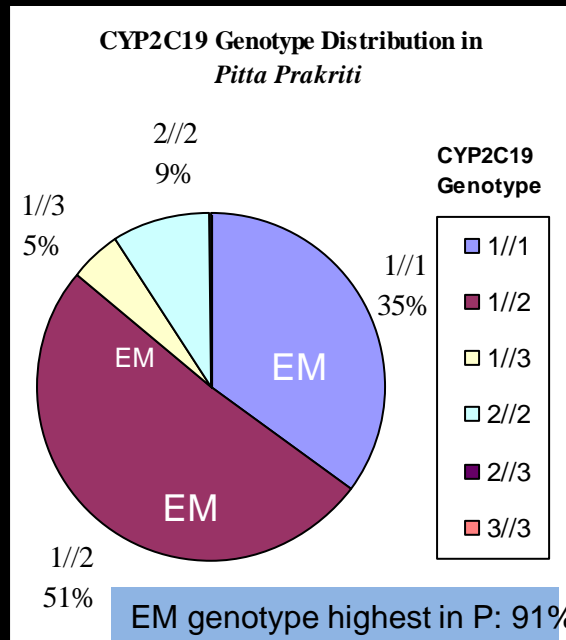
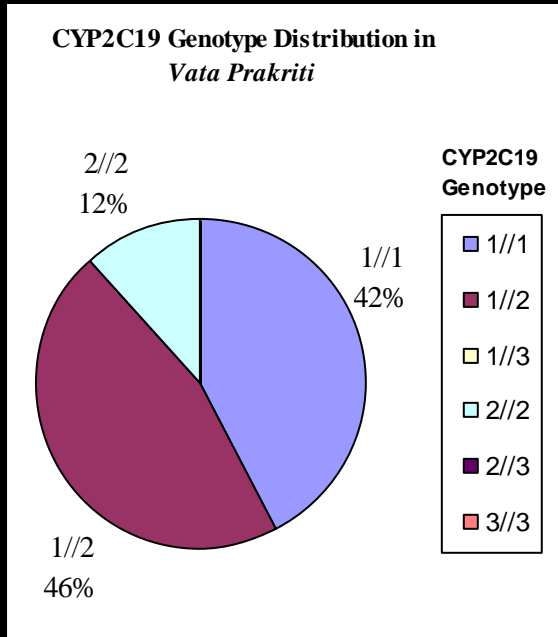
## Distribution of HLA alleles in *Prakriti*



Cold Spring Harbor Symposium: Pharmacogenomics November 2004

J. Alt. & Compl. Med, 2005, 11, 349.

# Distribution of CYP2C19 genotypes in *Prakriti*



EJEP2008

- Extensive metabolizer genotype (\*1/\*1, \*1/\*2, \*1/\*3) was found to be predominant in *Pitta Prakriti* (91%).
- \*1/\*3 genotype specific for extensive metabolizer group was present only in *Pitta Prakriti*.
- Poor metabolizer genotype (\*2/\*2, \*2/\*3, \*3/\*3) was highest (31%) in *Kapha Prakriti* when compared with *Vata* (14%) and *Pitta Prakriti* (9%).
- \*2/\*3 genotype typical for poor metabolizer group was observed only in *Kapha Prakriti*.

# AyuGenomics:

THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE  
Volume 11, Number 2, 2005, pp. 349-353  
© Mary Ann Liebert, Inc.

## Classification of Human Population Based on HLA Gene Polymorphism and the Concept of *Prakriti* in Ayurveda

PATWARDHAN BHUSHAN, Ph.D.,<sup>1</sup> JOSHI KALPANA, Ph.D.,<sup>1</sup> and CHOPRA ARVIND, M.D.<sup>2</sup>

### ABSTRACT

**Background:** Correlating phenotypes with genotypes remains the major postgenomic challenge. Attempts to correlate phenotype characteristics associated with ethnicity, geographical divisions, or diseases to genotypes have had limited success. This means that current approaches for identifying phenotypes associated with haplotypes may be inadequate.

**Objectives:** We hypothesize that a human phenome based on Ayurveda could provide an appropriate approach. Specifically, there could be a genetic basis for the three major constitutions (*Prakriti*) described in Ayurveda. The *Prakriti* classification is based on differences in physical, physiological, and psychological characteristics and is independent of racial, ethnic, or geographical considerations. It may provide an appropriate means of classifying phenotypes to be considered collectively for genotyping.

**Design:** As a pilot study to test the hypothesis, we evaluated 76 subjects both for their *Prakriti* and human leucocyte antigen (HLA) DRB1 types. The genomic DNA was extracted using a standard protocol. Subsequently, HLA DRB1 typing was done by low-resolution polymerase chain reaction sequence specific primers and oligonucleotide probes.

**Results:** We 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  $\chi^2 = 4.715$  and  $p < 0.05$ . HLA DRB1\*10 had higher allele frequency in the *Kapha* type than in the *Pitta* and *Vata* types.

**Conclusion:** Ayurveda classifies the whole human *Kapha* and their possible combinations. Their homologous genes are being validated. If validated, our hypothesis would modern genetics, human health, and Ayurveda.

2005

PNAS PNAS

## EGLN1 involvement in high-altitude adaptation revealed through genetic analysis of extreme constitution types defined in Ayurveda

Shilpi Aggarwal<sup>a</sup>, Sapna Negi<sup>a</sup>, Pankaj Jha<sup>a</sup>, Prashant K. Singh<sup>a</sup>, Tsering Stobdan<sup>a</sup>, M. A. Qadar Pasha<sup>a</sup>, Saurabh Ghosh<sup>b</sup>, Anurag Agrawal<sup>a</sup>, Indian Genome Variation Consortium<sup>a</sup>, Bhavana Prasher<sup>c,1</sup>, and Mitali Mukerji<sup>a,1</sup>

<sup>a</sup>Genomics and Molecular Medicine, Institute of Genomics and Integrative Biology, Council of Scientific and Industrial Research (CSIR), New Delhi 110007, India; <sup>b</sup>Human Genetics Unit, Indian Statistical Institute, Kolkata 700108, India; and <sup>c</sup>Planning and Performance Division, Council of Scientific and Industrial Research (CSIR), New Delhi 110001, India

Edited\* by Charles R. Cantor, Sequenom, San Diego, CA, and approved September 20, 2010 (received for review May 6, 2010)

It is being realized that identification of subgroups within normal controls corresponding to contrasting disease susceptibility is likely to lead to more effective predictive marker discovery. We have previously used the Ayurvedic concept of *Prakriti*, which relates to phenotypic differences in normal individuals, including response to external environment as well as susceptibility to diseases, to explore molecular differences between three contrasting *Prakriti* types: *Vata*, *Pitta*, and *Kapha*. *EGLN1* was one among 251

proline residues, leading to its polyubiquitination by the Von Hippel Lindau (VHL) E-3 ligase complex and subsequent degradation by the proteasomal machinery (3). Hypoxia leads to the inactivation of *EGLN1*, thereby increasing HIF that induces the expression of genes, which mediates adaptive responses through glycolytic enzymes, hemeoxygenase (cellular level), vascular endothelial growth factor (local), and erythropoietin (systemic level). Because oxygen homeostasis plays a key role in a large number of cellular

2010

ancient wisdom

eCAM Advance Access published December 16, 2009

eCAM 2009; Page 1 of 5  
doi:10.1093/ecam/nep206

### Original Article

## Traditional Medicine to Modern Pharmacogenomics: Ayurveda *Prakriti* Type and CYP2C19 Gene Polymorphism Associated with the Metabolic Variability

Yogita Ghodke<sup>1</sup>, Kalpana Joshi<sup>2</sup> and Bhushan Patwardhan<sup>1</sup>

<sup>1</sup>Bioprospecting Laboratory, Interdisciplinary School of Health Sciences, University of Pune and <sup>2</sup>Department of Biotechnology, Sinhgad College of Engineering, Pune, India

Traditional Indian medicine—Ayurveda—classifies the human population into three major constituents or *Prakriti* known as *Vata*, *Pitta* and *Kapha* types. Earlier, we have demonstrated a proof of concept to support genetic basis for *Prakriti*. The descriptions in Ayurveda indicate that individuals with *Pitta Prakriti* are fast metabolizers while those of *Kapha Prakriti* are slow metabolizers. We hypothesized that different *Prakriti* may have different drug metabolism rates associated with drug metabolizing enzyme (DME) polymorphism. We did *CYP2C19* (Phase I DME) genotyping in 132 unrelated healthy subjects of either sex by polymerase chain reaction–restriction fragment length polymorphism (PCR–RFLP) technique. We 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,  $P = 0.008$ ). We observed inter-genotypes and *Prakriti* with fast and slow metabolism differentiated characteristics. These observations are genotype-genotype correlation, drug discovery, pharma-

2009

9/30/2015

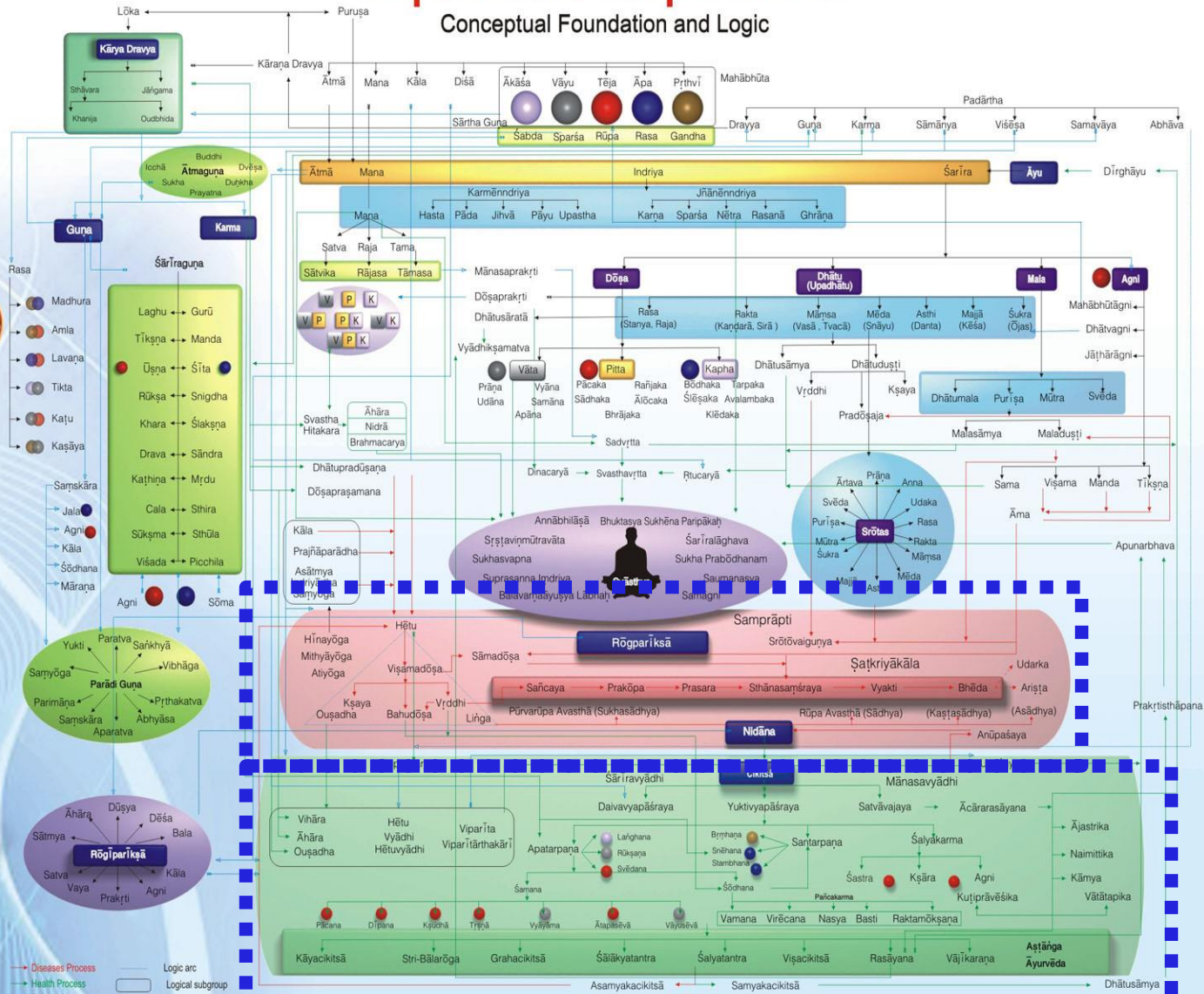
14

# Shastra for Science

New leads to modern science

# Systems Āyurvēda®

## Conceptual Foundation and Logic



Created by  
Girish Tiltu,  
G.G. Gangadharan,  
Ashok D.B. Vaidya &  
Bhushan Patwardhan

### About this Poster

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'Systems Āyurvēda' is an entity relationship notation based on Systems Biology Graphical Notation (SBGN) concept. This first poster broadly describes logical flow, forward links, backward links, entity relations and their applications in health and diseases. The foundations and logic of Āyurvēda is many based on Śāritya and Vaiśvika philosophy. According to this, every matter (Dhātva) is composed of five elemental elements (Mahābhūta). The manifested parts of matter are microcosm (the living) and macrocosm (universe), both could be assessed by similar logic and method. Man aim of Āyurvēda is to promote health, longevity and alleviate diseases. This is achieved through homeostasis of Dōṣa, Dhātu, Mala and Agni. Appropriate conduct including proper lifestyle and diet leads to health. Effects of Dravya diet, drug use as causative factor depends on properties and activities relative to the context. The processing (Sarpaka) enables augmentation of health promoting properties and reducing toxicity of medicines. The disease process initiates from causative factors (Mūla) and any disturbance in organs (e.g. Dhātu). The Sarpaka is process through several steps (Sarpakāla) and manifests into disease. The holistic approach of Āyurvēda management aims at establishing health through multifarious treatment modalities including counselling, avoiding causes, Pāñcakarma, medicines, diet and surgical procedures. Every aspect of 'Systems Āyurvēda' logic is related to other components and has specific role in maintenance of health and/or treating diseases. The 'whole to part' relation of Āyurvēda philosophy is important for better understanding of comprehensive account. The immense data consisting of near 500 variables describing logical flow and concepts of Āyurvēda have been presented using SBGN approach for processes, entity relationships and activity flow.

<sup>1</sup> Nadava N.L. et al. Systems Biology Graphical Notation. *Nature Biotechnology* 2009, 27, 735 – 741. (We thankfully acknowledge suggestions and inputs from Dr. Vilesh Patel, Dr. Venugopal, Dr. Vivek Shankar, Dr. Girish Tiltu, Dr. Praveen Chaturvedi and Dr. Sanjeev Ushale).

### Legends:

- Śārita
- Guṇa
- Svāsthya
- Samprāpti
- Śaṅkriyākāla
- Cikitsā
- Āṣṭāṅga Āyurvēda

a. Center for Development of Advanced Computing, Pune  
b. Foundation for Rehabilitation of Local Health Traditions, Bangalore  
c. Kasturba Health Society - Medical Research Centre, Mumbai  
d. Interdisciplinary School of Health Sci., University of Pune

9/30/2015

## Changes in prostate gene expression in men undergoing an intensive nutrition and lifestyle intervention

Dean Ornish<sup>\*\*\*</sup>, Mark Jesus M. Magbanua<sup>§</sup>, Gerdi Weidner<sup>\*</sup>, Vivian Weinberg<sup>¶</sup>, Colleen Kemp<sup>\*</sup>, Christopher Green<sup>§</sup>, Michael D. Mattie<sup>§</sup>, Ruth Marlin<sup>\*</sup>, Jeff Simko<sup>||</sup>, Katsuto Shinohara<sup>§</sup>, Christopher M. Haqq<sup>§</sup> and Peter R. Carroll<sup>§</sup>

<sup>§</sup>Department of Urology, The Helen Diller Family Comprehensive Cancer Center, and <sup>||</sup>Department of Pathology, University of California, 2340 Sutter Street, San Francisco, CA 94115; <sup>\*</sup>Preventive Medicine Research Institute, 900 Bridgeway, Sausalito, CA 94965; <sup>¶</sup>Department of Medicine, School of Medicine, University of California, 505 Parnassus Avenue, San Francisco, CA 94143; and <sup>¶</sup>Biostatistics Core, The Helen Diller Family Comprehensive Cancer Center, University of California, 513 Parnassus Avenue, Box 0127, San Francisco, CA 94143

Communicated by J. Craig Venter, The J. Craig Venter Institute, Rockville, MD, April 2, 2008 (received for review February 13, 2008)

**Intensive nutrition and lifestyle changes may modulate gene expression. Understanding the molecular response to comprehensive lifestyle changes may strengthen efforts to develop effective prevention and treatment.**

# The new evidence for Swastha vrita:

Ahara, Vihar, Ritu and Dinacharya

REVIEW

The logo for the journal Science, featuring the word "Science" in white serif font on a red rectangular background.The logo for the American Association for the Advancement of Science (AAAS), featuring the letters "AAAS" in blue and red on a white background.

## Circadian Integration of Metabolism and Energetics

Joseph Bass, *et al.*

*Science* **330**, 1349 (2010);

DOI: 10.1126/science.1195027

Joseph Bass<sup>1,2,3,4\*</sup> and Joseph S. Takahashi<sup>5,6</sup>

Circadian clocks align behavioral and biochemical processes with the day/night cycle. Nearly all vertebrate cells possess self-sustained clocks that couple endogenous rhythms with changes in cellular environment. Genetic disruption of clock genes in mice perturbs metabolic functions of specific tissues at distinct phases of the sleep/wake cycle. Circadian desynchrony, a characteristic of shift work and sleep disruption in humans, also leads to metabolic pathologies. Here, we review advances in understanding the interrelationship among circadian disruption, sleep deprivation, obesity, and diabetes and implications for rational therapeutics for these conditions.

15.3. Vaidya AB *et al*, Chronobiology of Ischaemic Heart Disease Events: Relevance of Ancient Insights in Human Life-Style, *J Asso Physicians India* 1999; Vol 47(6)629-630.



11 years ago...

# Why undermine Nadi pariksha..

BMJ

RESEARCH

## Resting heart rate as a low tech predictor of coronary events in women: prospective cohort study

Judith Hsia, professor,<sup>1</sup> Joseph C Larson, statistician,<sup>2</sup> Judith K Ockene, professor,<sup>3</sup> Gloria E Sarto, professor,<sup>4</sup> Matthew A Allison, assistant professor,<sup>5</sup> Susan L Hendrix, physician,<sup>6</sup> Jennifer G Robinson, associate professor,<sup>7</sup> Andrea Z LaCroix, professor,<sup>2</sup> JoAnn E Manson, professor,<sup>8</sup> for the Women's Health Initiative Research Group

**Objective** To evaluate resting heart rate as an independent predictor of cardiovascular risk in women.

**Design** Prospective cohort study.

**Setting** The Women's Health Initiative was undertaken at 40 research clinics in the United States.

**Participants** 129 135 postmenopausal women.

**Main outcome measure** Clinical cardiovascular events.

**Conclusion** Resting heart rate, a low tech and inexpensive measure of autonomic tone, independently predicts myocardial infarction or coronary death, but not stroke, in women.

# Angulipramanam concepts are important

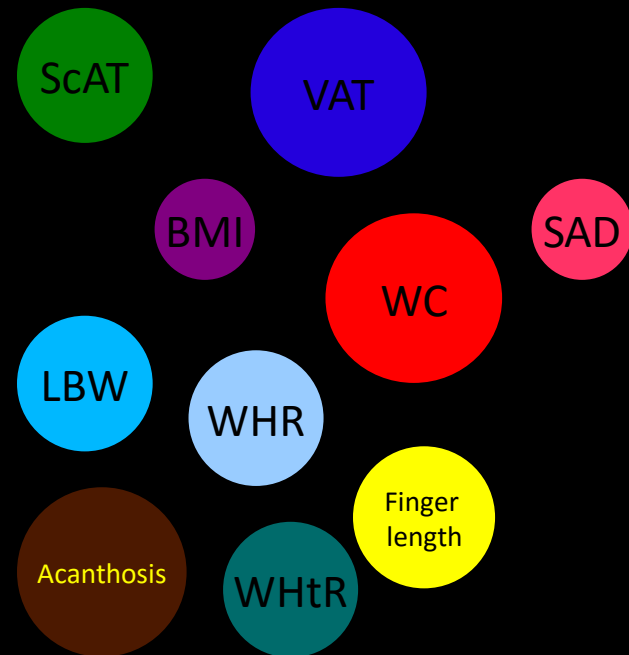
**BMJ** **RESEARCH**

Thigh circumference and risk of heart disease and premature death: prospective cohort study

Berit L. Heitmann, professor, director of research,<sup>1</sup> head of section, health promotion in hospitals,<sup>2</sup> Peder Frederiksen, statistician<sup>1</sup>

**Conclusion** A low thigh circumference seems to be associated with an increased risk of developing heart disease or premature death. The adverse effects of small thighs might be related to too little muscle mass in the region. The measure of thigh circumference might be a relevant anthropometric measure to help general practitioners in early identification of individuals at an increased risk of premature morbidity and mortality.

## Anthropometric markers of Insulin resistance



SAD = Sagittal abdominal diameter, WC = Waist Circumference, ScAT = Subcutaneous Adipose Tissue, VAT = Visceral Adipose Tissue, WHR = Waist Hip Ratio, WHtR = Waist to Height Ratio, LBW = Low Birth Weight

# Why undermine Pathya – Apathya Vichar..

Published by Oxford University Press on behalf of the International Epidemiological Association  
© The Author 2010; all rights reserved. Advance Access publication 15 March 2010

*International Journal of Epidemiology* 2010;**39**:889–899  
doi:10.1093/ije/dyq008

## DIABETES

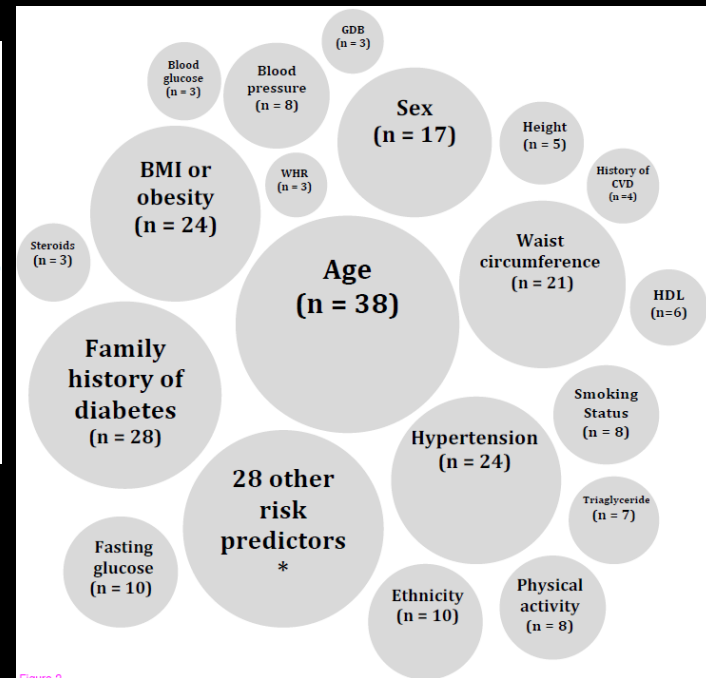
# Dietary patterns are associated with lower incidence of type 2 diabetes in middle-aged women: the Shanghai Women's Health Study

Raquel Villegas,<sup>1\*</sup> Gong Yang,<sup>1</sup> Yu-Tang Gao,<sup>2</sup> Hui Cai,<sup>1</sup> Honglan Li,<sup>2</sup> Wei Zheng<sup>1</sup> and Xiao Ou Shu<sup>1</sup>

We identified and characterized dietary patterns in middle-aged Chinese women by using cluster analysis. We identified a dietary pattern low in staple foods and high in dairy milk, which was associated with lower risk of T2D. Study of dietary patterns will help elucidate links between diet and disease, and contribute to the development of healthy eating guidelines for health promotion.

# Developing risk prediction models for type 2 diabetes: a systematic review of methodology and reporting. *BMC Medicine* 2011, 9:103 doi:10.1186/1741-7015-9-103

**Conclusions:** We found widespread use of poor methods that could jeopardise model development, including univariate pre-screening of variables, categorisation of continuous risk predictors and poor handling of missing data. The use of poor methods affects the reliability of the prediction model and ultimately compromises the accuracy of the probability estimates of having undiagnosed type 2 diabetes or the predicted risk of developing type 2 diabetes. In addition, many studies were characterised by a generally poor level of reporting, with many key details to objectively judge the usefulness of the models often omitted.



**Shatkriyakal**

**Prameha Proclivity Factors**



## Acute Cervical Pain Syndrome Resulting from Suppressed Sneezing

JAPI • VOL. 56 • SEPTEMBER 2008

Sneezing is only one of the thirteen types of vegadhaarana described in Ayurveda. Amongst the others the suppression of flatus and bowel movement can be a contributory factor to reverse peristalsis and aging diverticular disease.<sup>4</sup> Sushruta collectively refers to these dysfunctions as Udaavarta, subsets of which are intestinal counterperistalsis and the vesico-ureteric reflux. In Ayurveda, healthy habits include the concern for sudden suppression of responses to stimuli coupled with self-restraint on excesses or indulgence in food, sex, exertion or sleep, as recommended by modern medicine. It would be interesting to investigate clinically the events which may follow the habitual suppression of urges like micturition, belching, hunger, thirst, sleep, crying and ejaculation. Vegadhaarana proposed as a pathogenic factor in Ayurveda may offer a shift in the paradigm for understanding the putative lesions caused by dissipation of the built-up massive pressure resulting from a suppressed reflex.

Namyata Pathak\*, A Raut\*\*, A Vaidya\*\*\*

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# High Impact Projects

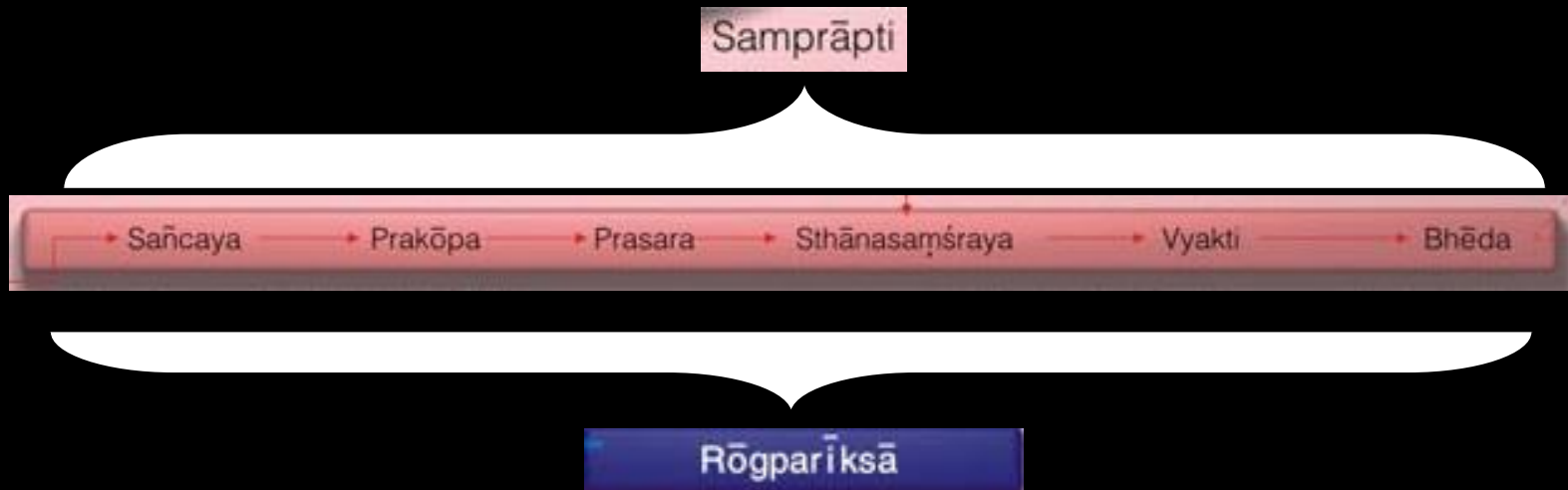
- Project 1: Association between quantum sciences and *panchamahabhoota*  
High Risk/High Impact.
- Project 2: Shatkriyakal and disease progression  
Medium Risk/High Impact
- Project 3: Immunological basis of Rasayana  
Low Risk/High Impact
- Project 4: Kayakalpa and Regenerative medicine  
Low Risk/High Impact
- Many other Projects on basic principles such as Agni, Srotasa, Rasa, etc should give new understanding to modern biology and biomedicine.

# High Impact Projects

## Understanding Shatkriyakkal concept with Prameha as a Model

A Multi-institutional Collaborative High Impact Project (HIP)

Link biological phenotypes to anthropometric, genomic, epigenomic & chemical basis – Can Ayurveda show us the way ?



# Healthy phenotype

A phenotype that is negative for any disease

1. Sanchaya (accumulation)

2. Prakopa (aggravation)

3. Prasar (pathological indication)

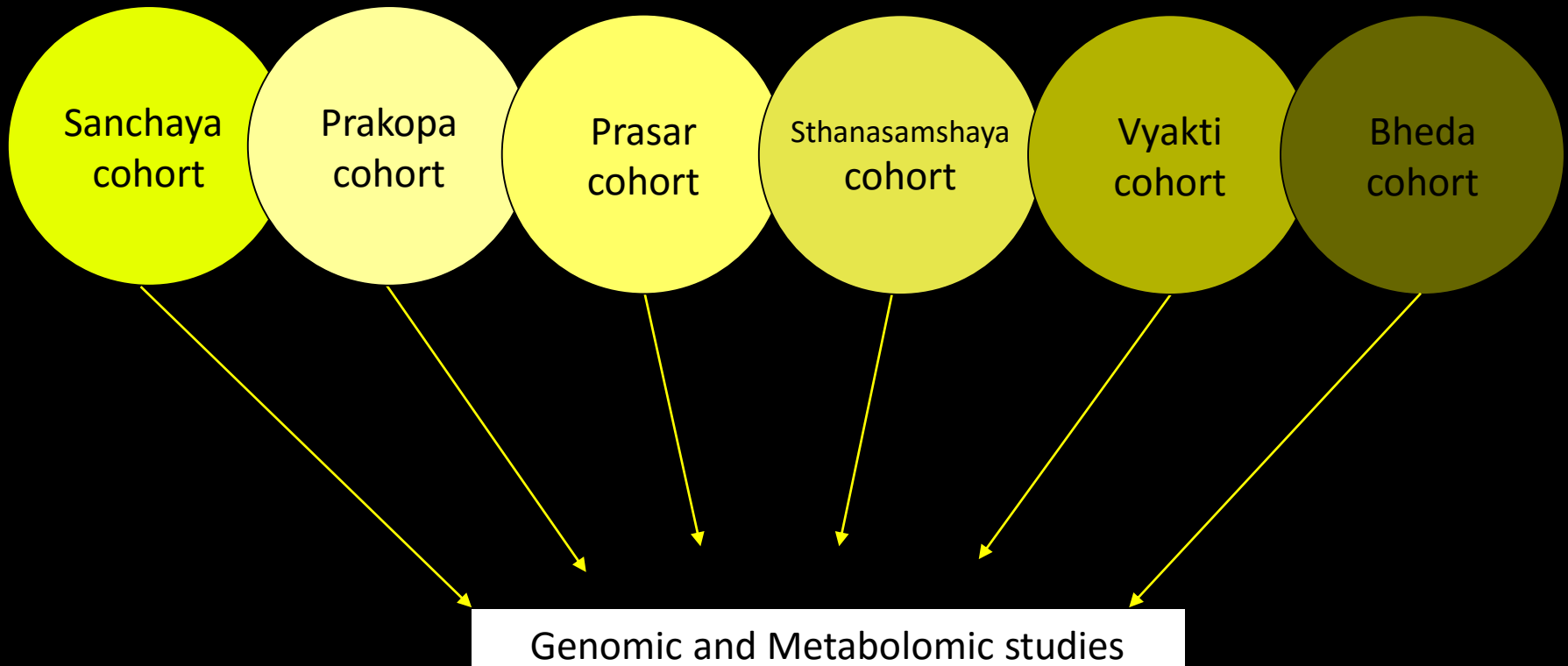
4. Sthansanshaya (organ specific localization)

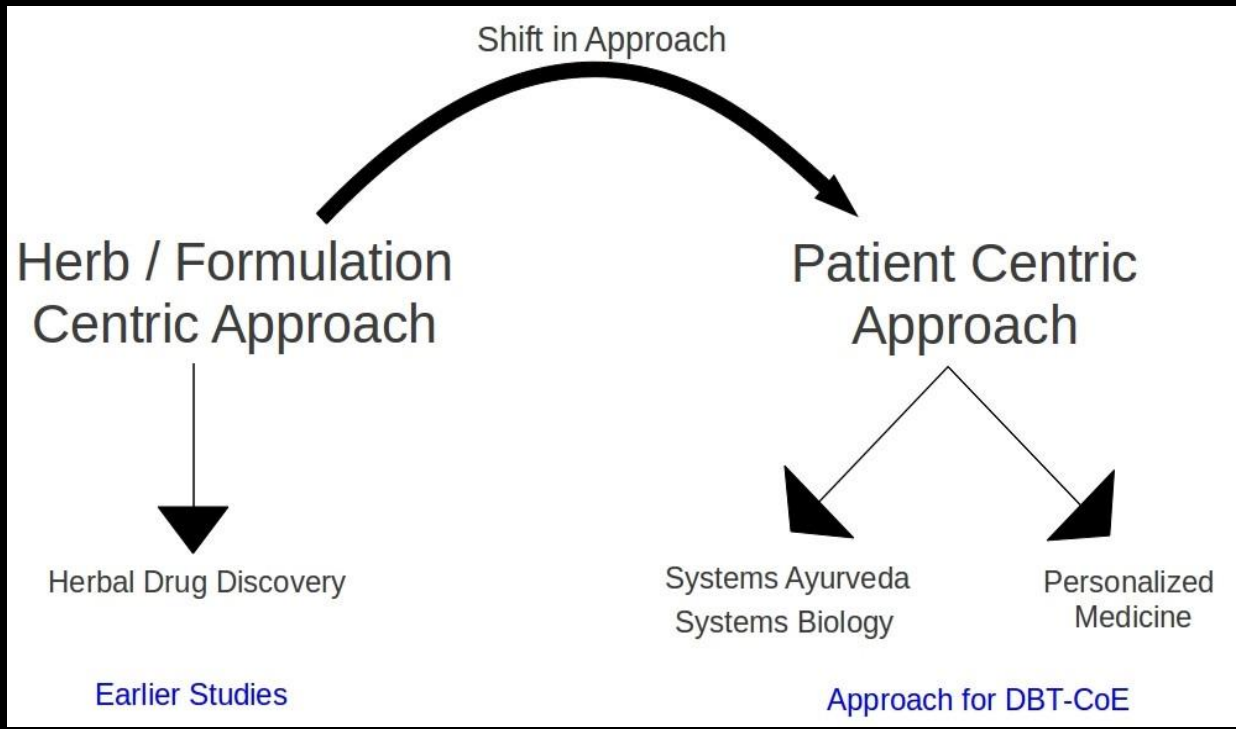
5. Vyakti (disease expression)

6. Bheda (irreversible damage)

A phenotype that is positive for a disease biomarker - low adiponectin, low HDL

# Expected Outcome





Ayurveda: Holistic Science of Mind, Body and Spirit

# The Mind

Heart- Brain

# The Brain

## Left brain expression (Academic)

detail oriented  
 (Looks at parts)  
 Logical  
 Sequential  
 Rational  
 math and science  
 can comprehend  
 Analytical  
 Objective  
 uses logic  
 facts rule  
 words and language  
 present and past  
 knowing  
 acknowledges  
 knows object name  
 reality based  
 forms strategies  
 order/pattern perception  
 practical/planned  
 safe  
 cautious

## Right brain expression (Creative)

'big picture' oriented  
 (Looks at wholes)  
 Random  
 Intuitive  
 Holistic  
 philosophy & spiritualism  
 can 'get it' (the meaning)  
 Synthesizing  
 Subjective  
 uses feeling  
 imagination rules  
 symbols and images  
 present and future  
 believes  
 appreciates  
 knows object function  
 fantasy based  
 presents possibilities  
 spatial perception  
 impetuous/spontaneous  
 adventurous  
 carefree/risk taking

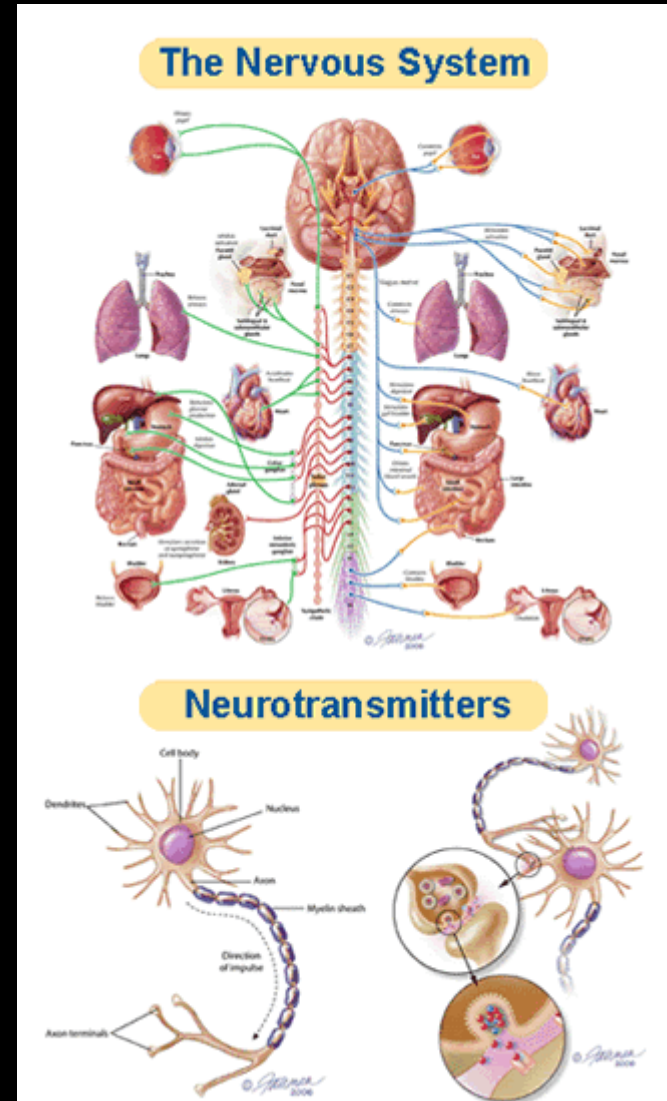
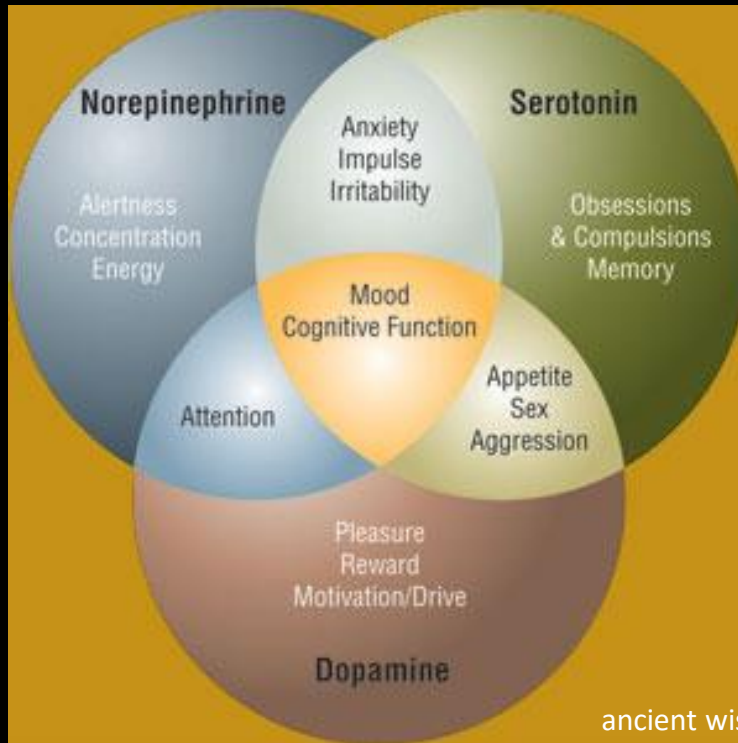
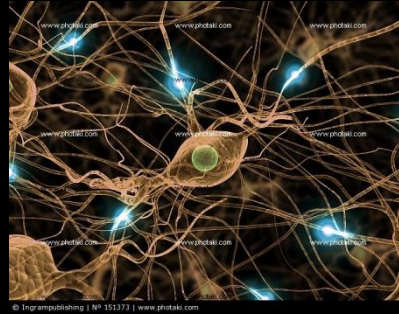
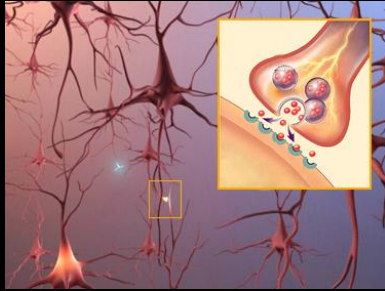


Illustration by: VaXzine

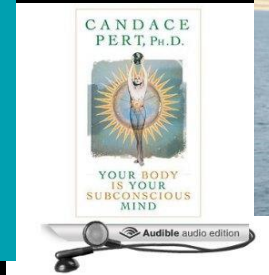
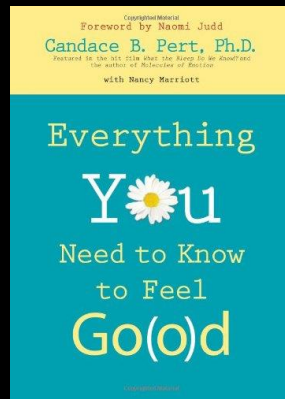
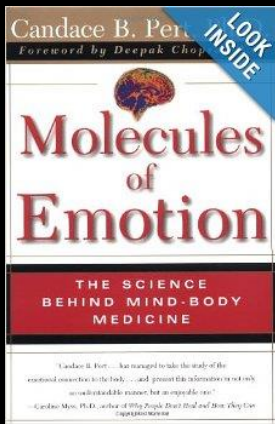
Written and slide design by Dr C Daniels 2008

# Mind-Brain-Body

## Neurotransmitters



# Bridging the gap between Science and Spirituality



“Healing the Hurting, Shining the Light” was produced by Dr. Pert with her son, Brandon Pert, a musician-audio production expert and sound mixer

**Patient perspectives: Kundalini yoga meditation techniques for  
psycho-oncology and as potential therapies for cancer.**

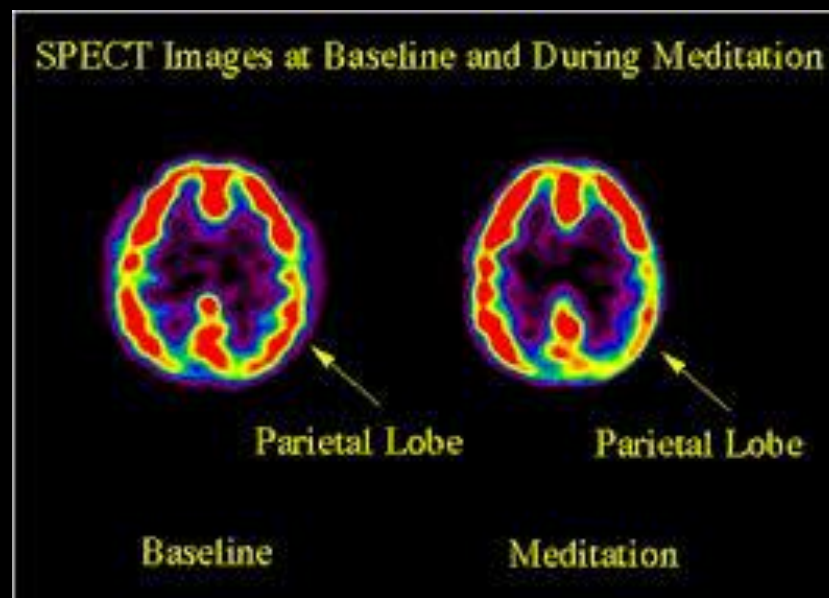
Integr Cancer Ther. 2005 Mar;4(1):87-100.

David Khalsa,

The Research Group for Mind-Body Dynamics, Institute for  
Nonlinear Science, University of California, San Diego, California  
USA.

# Cerebral blood flow changes during chanting meditation

David Khalsa et al. Nucl Med Commun. 2009 Dec;30(12):956-61.  
Alzheimer's Research and Prevention Foundation, Tucson, Arizona, USA.



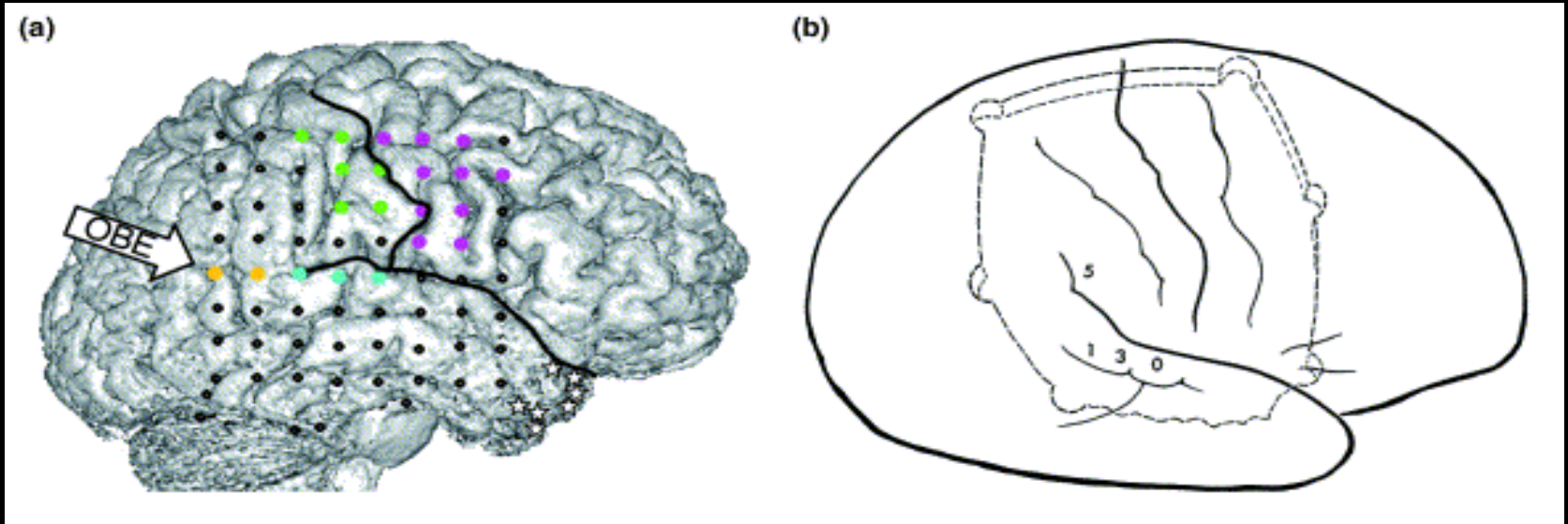
When the meditation state was compared with the baseline condition, significant rCBF increases were observed in the right temporal lobe and posterior cingulate gyrus, and significant rCBF decreases were observed in the left parietotemporal and occipital gyri.

Ayurveda: Holistic Science of Mind, Body and Spirit

# The Spirit

Unknown territory to modern science

# Out of Body Experience



Stimulating illusory own-body perceptions, Blanke O. *et al.* (2002), *Nature*, 419:269-270.

Out-of-body experiences: from Penfield to present, Frank Tong, *Trends in Cognitive Sciences*, 2003, 7:104-106

Department of Psychology, Princeton University, Princeton, NJ 08544, USA

# Patanjali, Penfield and SAMADHI !

Samadhi

Much beyond just Out of Body Experience!

Way to gain knowledge and not just for fun!!

Way to the ultimate realization!!!





Interest



Calm



Angry



Happy



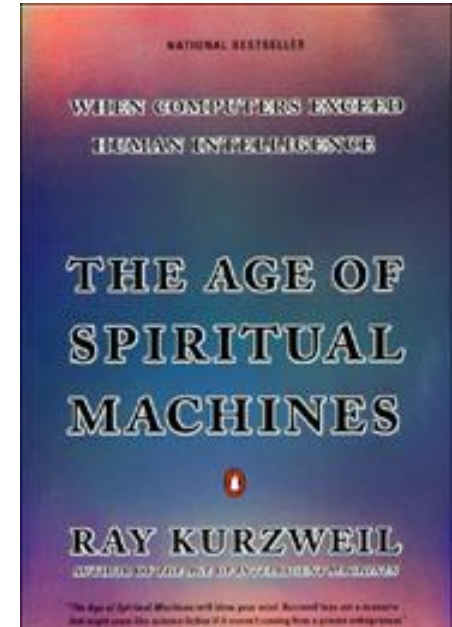
Sad



Surprise



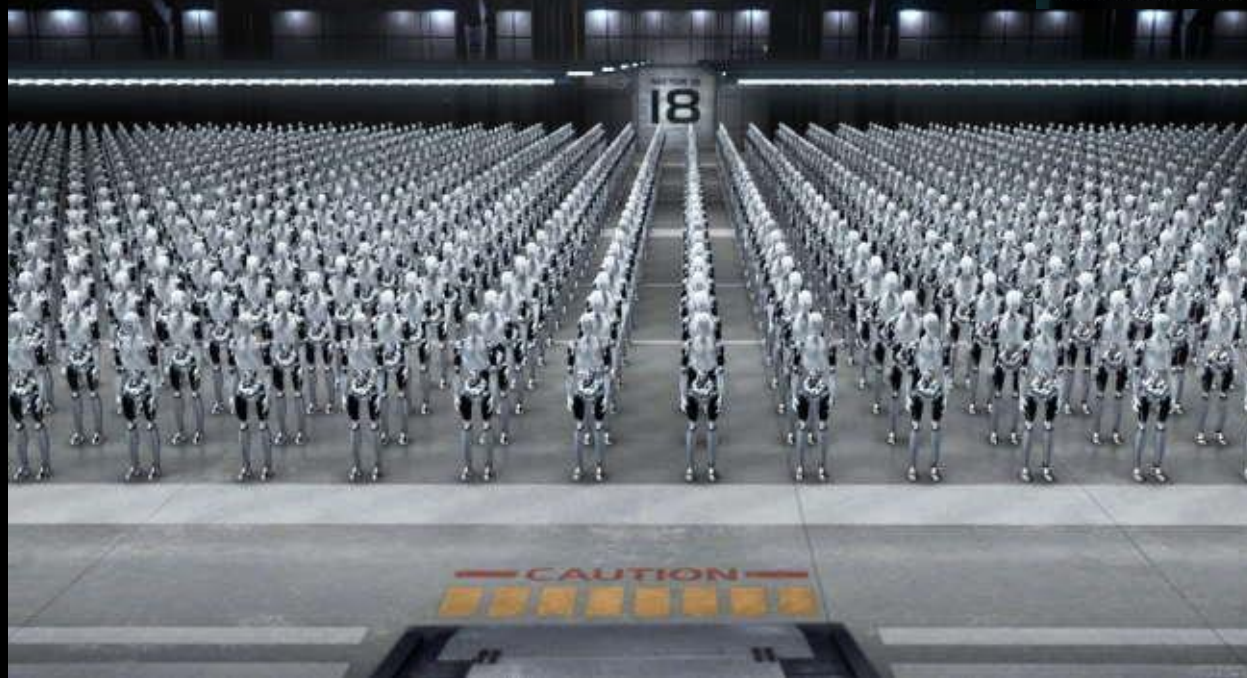
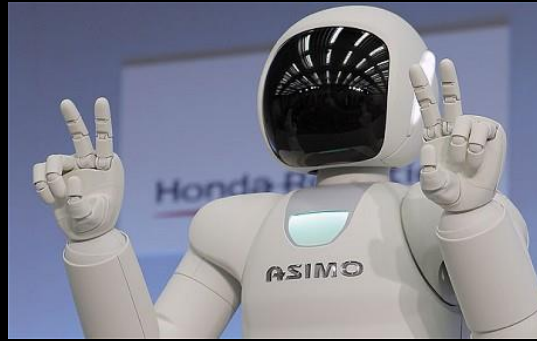
Disgust



the difference between man and machine blurs, where the line between humanity and technology fades, and where the soul and the silicon chip unite.

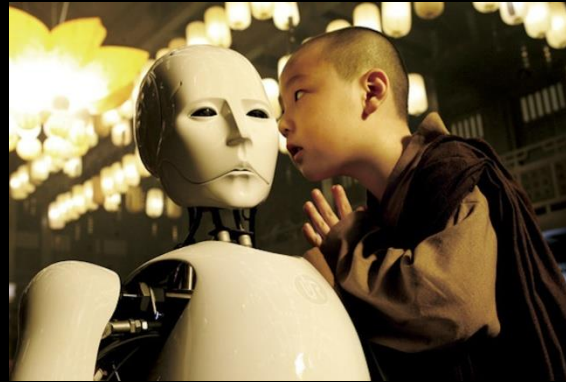
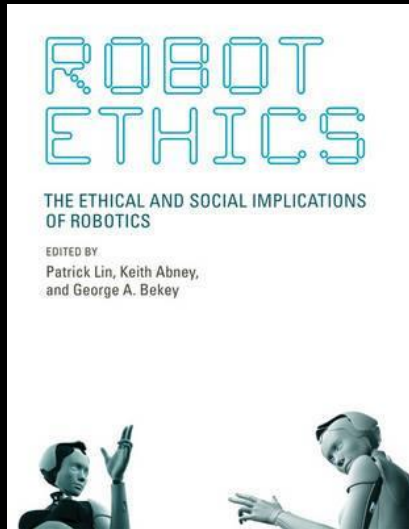
# Kismet, the robot

MIT Artificial Intelligence Laboratory



# Killer Robots or Peaceful Buddha??

## Spirituality will be the way ahead



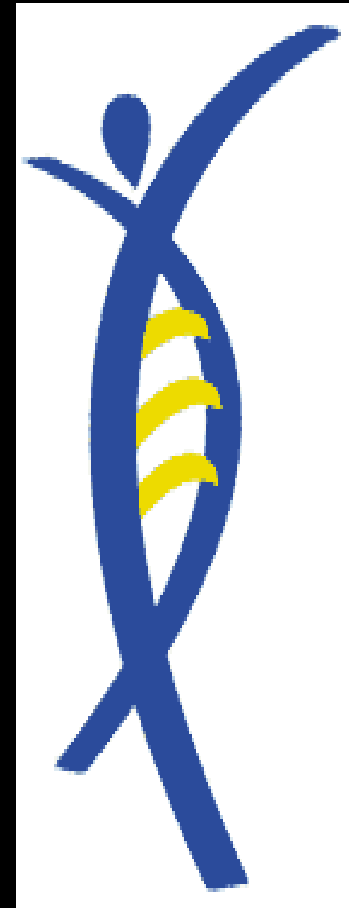
# Becoming Human and Beyond

"Who am I?

Where did I come from?

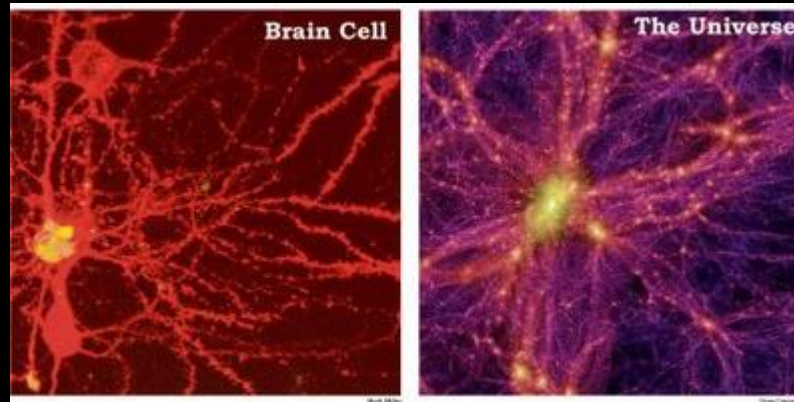
Why am I here?

Where am I going?"



[American Association for the Advancement of Science](#)

November 1-3, 2001 Chicago



## Pindi to Brahmandi!

Same genetic code for all life forms

This meeting brings a right confluence of Mind, Body and Spirituality

Science, Technology and Sprituality for Global Good!

It is only due to internal urge  
that an achievement can take  
place.

Yoga Vashistha

Some time 5000 years ago