

Traditional Medicine:

Modern Approach For Affordable Global Health

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CIPIH: Research question

Traditional Medicine: Could more effective use be made of them in providing affordable treatments ?

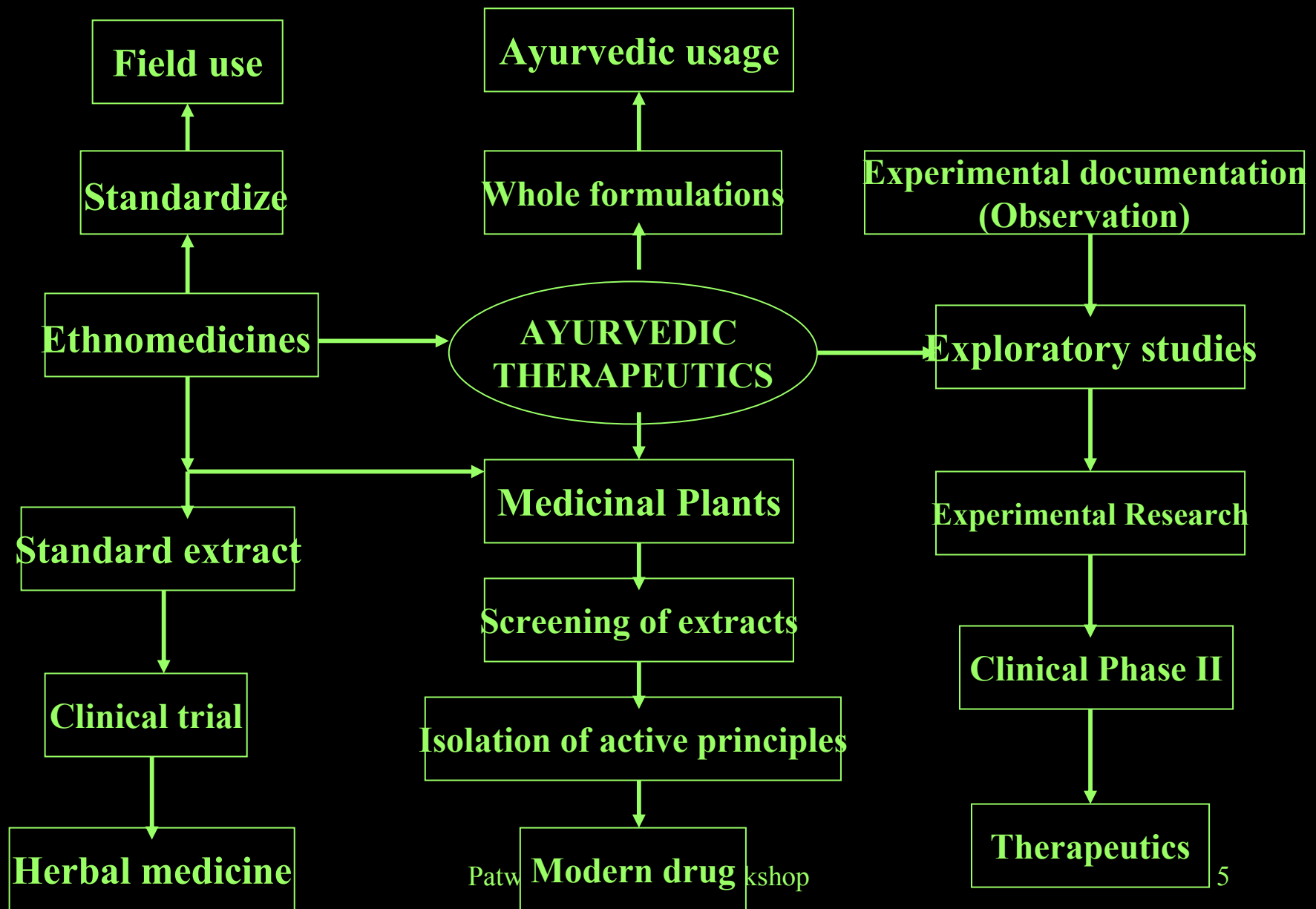
TM Best practices: Home remedies

- Turmeric in wound healing
- Tinospora in sepsis
- Asparagus as galactagogue
- Long pepper as bioenhancer
- Neem for oral hygiene
- Ashwagandha for growing children
- Oil massage for babies
- Yoga for CVDs

TM Best Practices: Drug Discovery

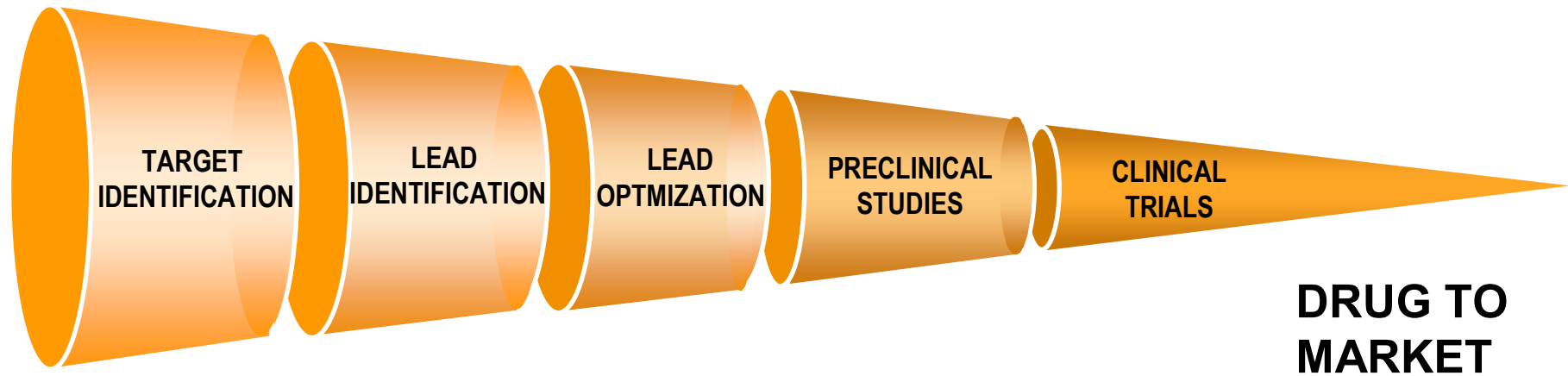
CSIR: NMITLI and Network Projects

Drug Discovery, Reverse Pharmacology and Ayurveda



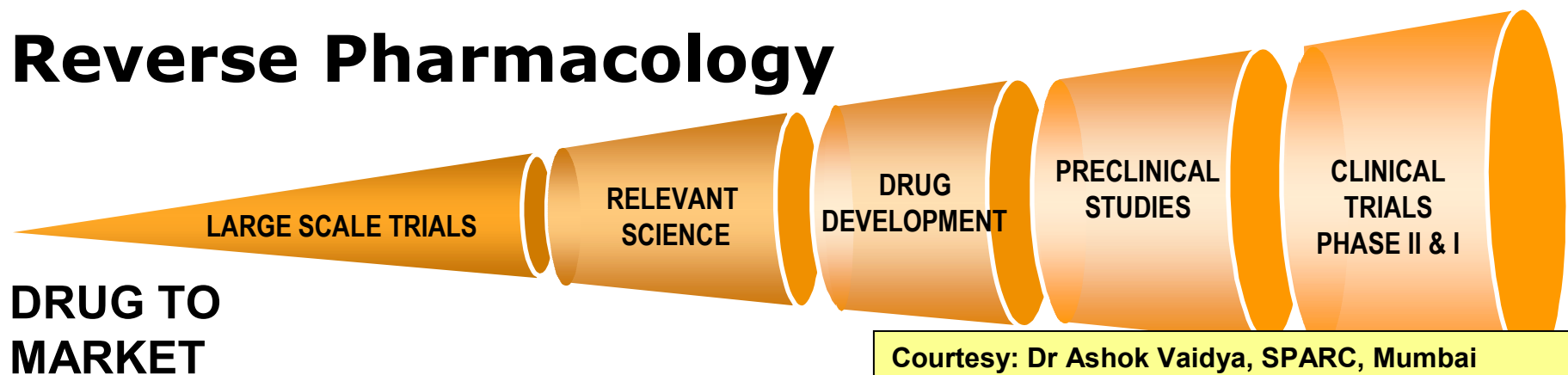
Drug Discovery and Development Process

Expensive, time consuming, numerous bottlenecks



Economical, time sparing, least bottlenecks

Reverse Pharmacology



Courtesy: Dr Ashok Vaidya, SPARC, Mumbai

NMITLI Herbal Drug Development

3 Years Outcome

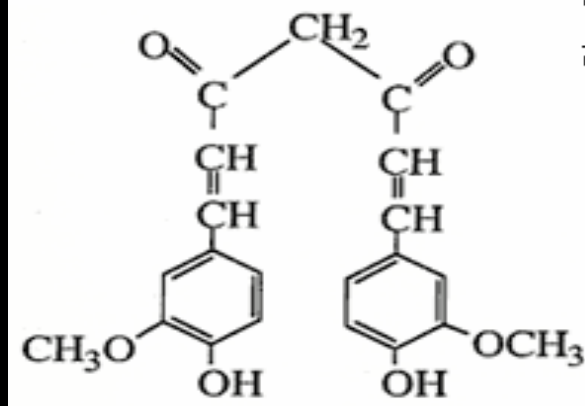
- Rheumatic and Musculoskeletal Disorders
 - Osteoarthritis, Rheumatoid arthritis
 - Stage I RCT indicated one formulation significantly better than Glucosamine
- Hepatic Disorders
 - Pre-clinical suggest better activity than sylimarine
- Diabetes
 - Pre-clinical suggest better insulin sensitizing activity

Leads from Ayurveda

Curcumin, Gingerol, Gugulosterones, Eugenol, catechins, Anethol, Piperine, Apocynin, Genestein, polysaccharides from TC, biflavonoids from Semecarpus, Gallates, Bacosides, Boswellic acid, Glycyrrhizin, Allicin...

Curcuma longa

- Ayurvedic description
- Lead molecule: Curcumin



हरिद्रा

मेहेषु धात्री निशा (अष्टांगहृदय)

हरिद्रा विषघ्न कुष्ठघ्न कंडूघ्न (चरकसंहिता)

हरिद्रा कटुका तिक्ता रूक्षोष्णा कफपित्तनुत् ।

वर्ष्या त्वग्दोषमेहास्रशोथ पांडुव्रणापहा ॥

(भावप्रकाशनिघंटु)

- Biological targets: Aryl hydrocarbon receptor, Cytochrome P450 enzymes, Glutathione S-transferase, kinases, COX, iNOS, MMP
- Therapeutic class: Cancer, Inflammation, **Diabetes** and **Chemo prevention**

Chen HW. Anti-invasive gene expression profile of curcumin in lung adenocarcinoma based on a high throughput microarray analysis. *Mol Pharmacol.* 2004 Jan; 65(1): 99-110. Patwardhan - CIPM Workshop

Limtrakul P, Modulation of human multidrug-resistance MDR-1 gene by natural curcuminoids. *BMC Cancer.* 2004 Apr 17; 4(1): 13.

Zingiber officinale

- Ayurvedic description
- Lead molecule: Gingerols

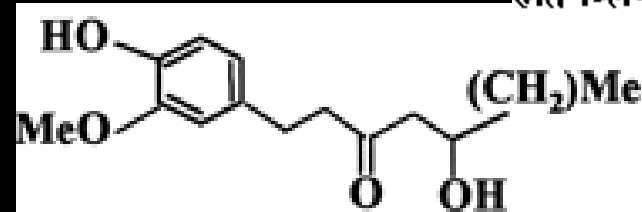
शुंठी

शूलप्रशमन दीपनीय तृप्तीघ्नानि (चरकसंहिता)

शुंठी रूच्यामवातघ्नी पाचनी कटुका लघु । सिग्धोष्णा मधुरा पाके
कफत्वातविबन्धनुत् ।

वृष्यास्वर्या वमिकासशूलश्वास हृदामयान ।

हृति श्लिषदशोथार्श आनहोदरमारुतान् ॥ (भावप्रकाशनिघंटु)



- Biological targets: Vanilloid receptors
- Therapeutic class: Antipyretic, analgesic, antitussive, cardiotonic, and sedative

Dedov VN. Gingerols: a novel class of vanilloid receptor (VR1) agonists. *Br J Pharmacol*. 2002 Nov; 137(6): 793-8.

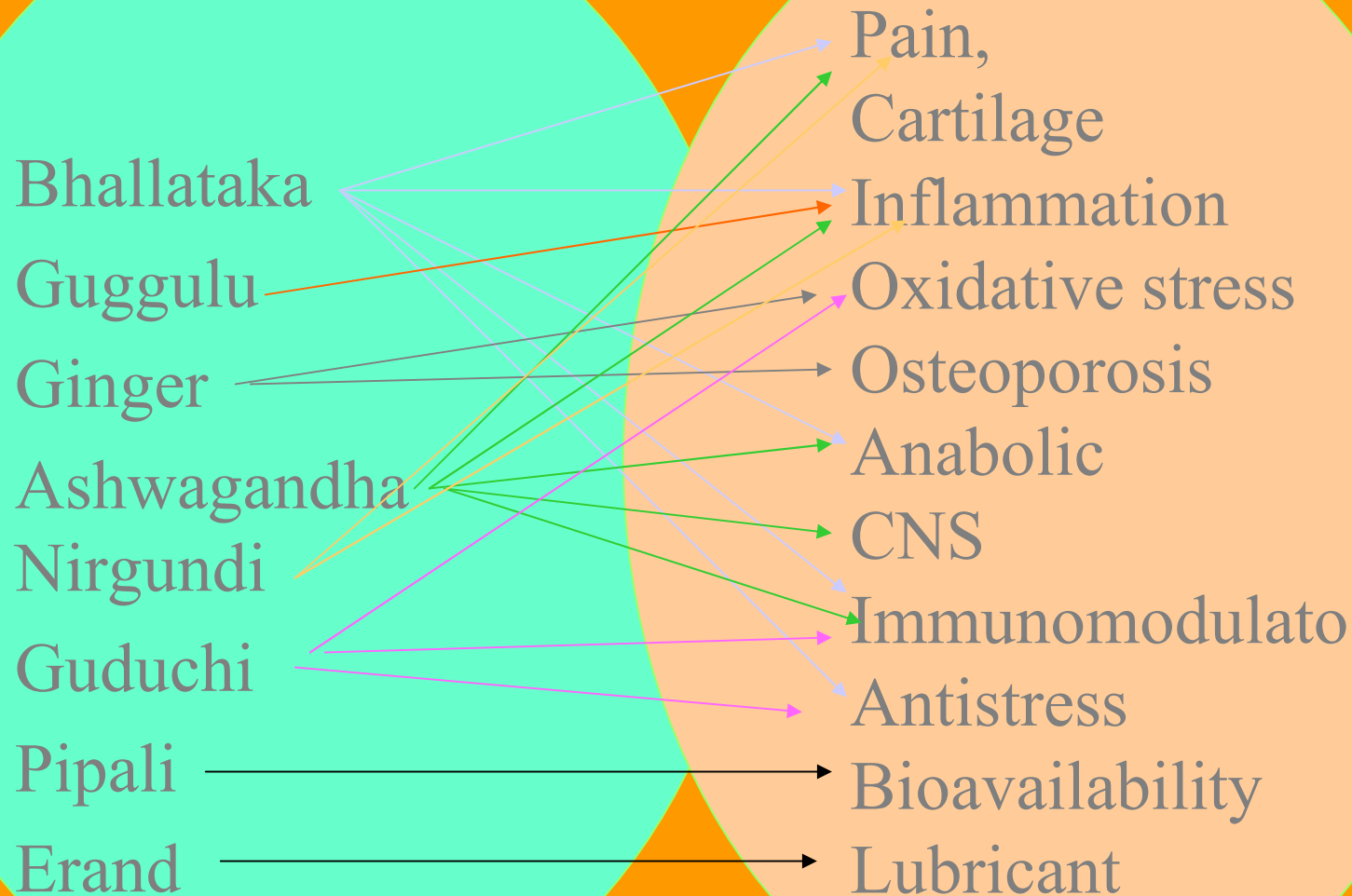
Ohizumi et al. Stimulation of sarcoplasmic reticulum Ca (2+)-ATPase by gingerol analogues. *Biol Pharm Bull*. 1996 Oct; 19(10): 1377-9.

June 1, 2005

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Multiple Targets Need A Combo



Activity Matrix: Systems-Biology Approach

Combinatorial, Holistic and Systems Approach: The Most Modern View

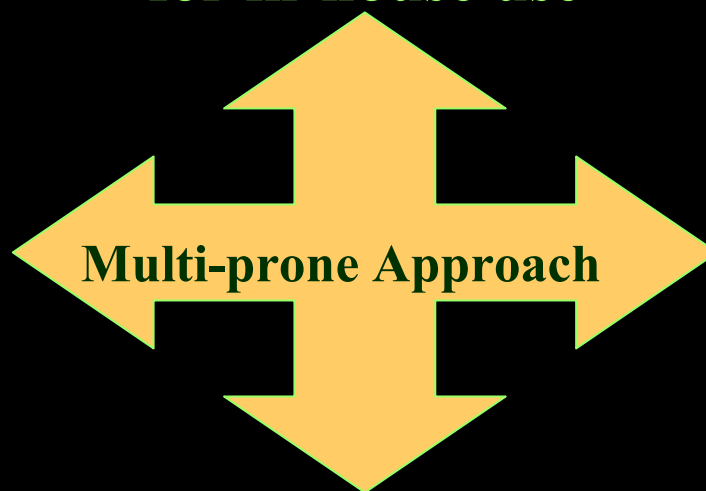
- The preparation of dual- or multiple-ligands on an almost rational basis is now conceivable and it can be expected that many of these molecules will yield drugs of superior clinical value compared with monotarget formulations.

Multitargeted drugs: The end of the 'one-target-one-disease philosophy?
Camille Wermuth, *Drug Discovery Today* 19, October 2004

Ayurveda: Systems Advantage

**Standardized traditional formulations
for in-house use**

**Science base
Evidence to
understand
mechanisms**



**Drug Discovery
engine to
reduce Target
to Lead
bottleneck**

Chemical biology approach for new Leads

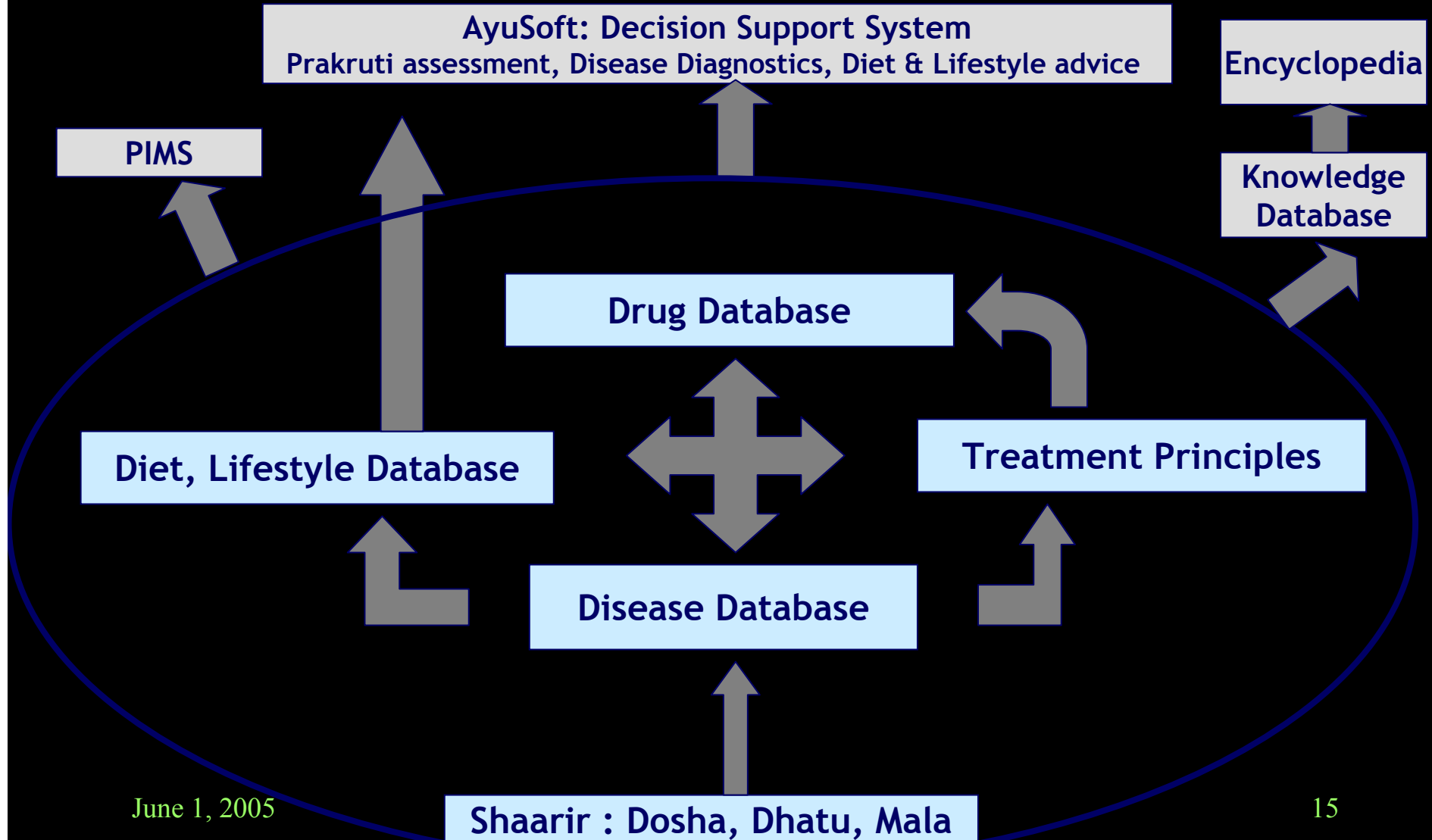
Natural product extract libraries

Holistic and Personalized Concepts

AyuSoft and AyuGenomics

- A comprehensive, interactive and intelligent software to assist Medical Practitioners and Researchers
- Pharmacogenomics applications based on Basic Principles of Ayurveda

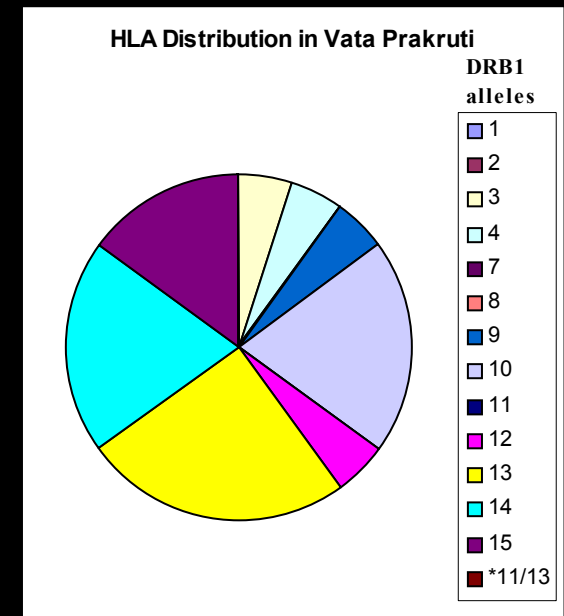
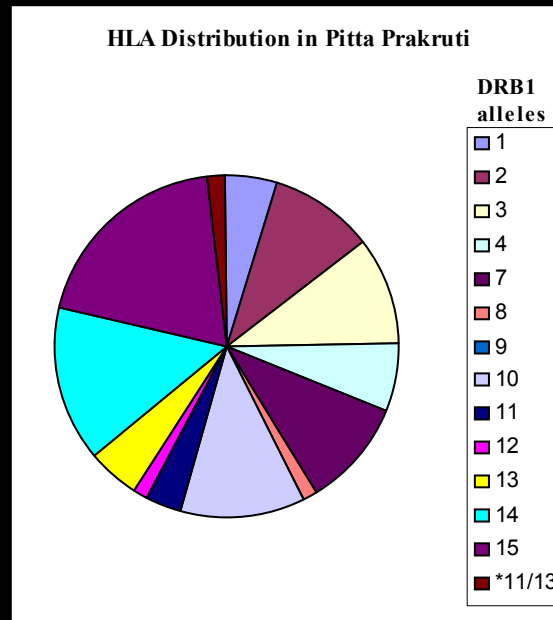
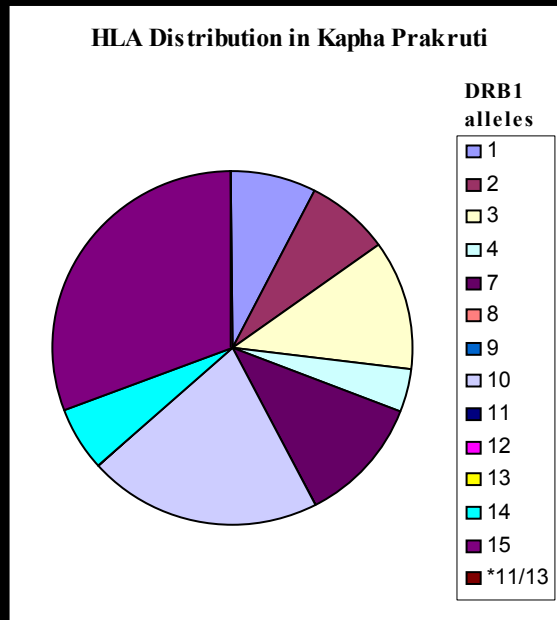
AyuSoft



AyuGenomics: Proof of concept

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

Distribution of HLA alleles in *Prakriti*

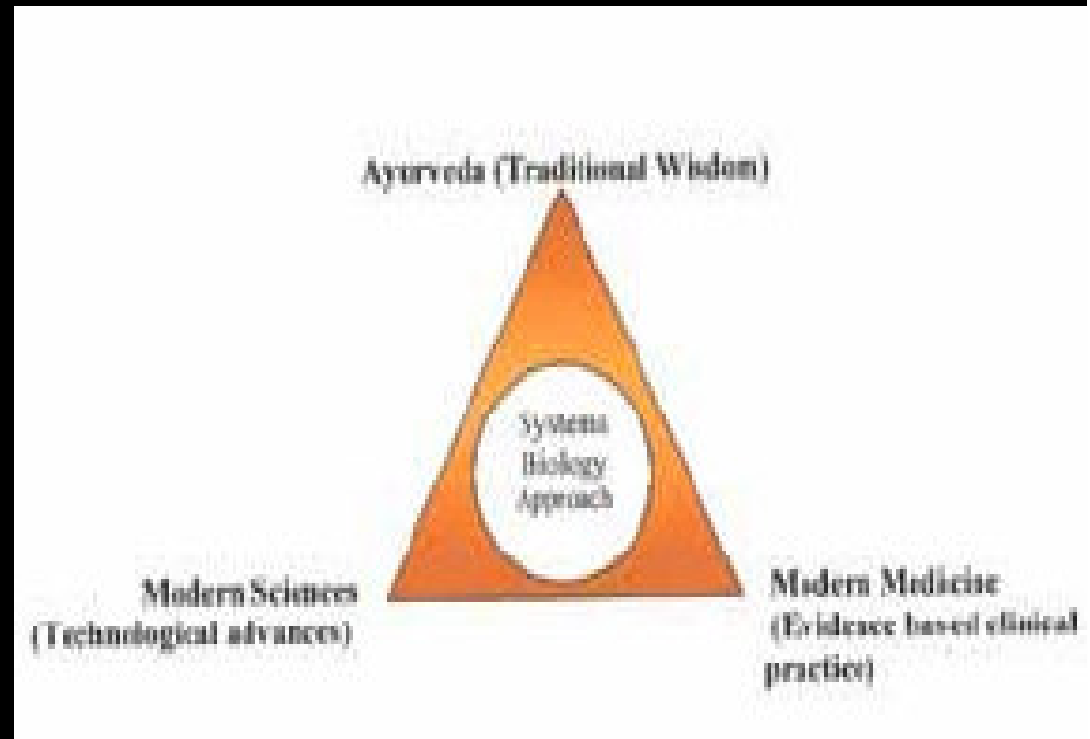


Cold Spring Harbor Symposium Pharmacogenomics: November 2004

Journal of Alternative and Complementary Medicine, April 2005

Traditions and Modernity: Future Medical Science

Golden Triangle approach promotes effective integration of traditional wisdom, power of contemporary science & technology and the evidence base of modern medicine where the holistic strategies reflect from the systems biology principles. **Golden Triangle approach** provides holistic or whole person healing viewpoint besides a new platform for drug discovery.



Mashelkar R.A., Chitrakoot Declaration, 2003

Conclusions

The undercurrents

- Health care affordability receding away from global majority at alarming pace
- Widening wealth disparity and polarization at global level
- Failure of modern medicine to deliver panacea despite advances in science and technology
- Expenditure on health is still out of pocket for majority
- Expenditure on TM is almost exclusively out of pocket in all countries or societies

Proposals

- Facilitate research on TM & public health.
- Capacity building for sharing and harmonization of best practices.
- Develop novel approaches to regulate TM
- Human resource development for education, research and practice of TM.

“It is better to light a candle than
to curse the darkness.”

Con-Fu-Tse

We see initiative of CIPIH in
this light of ancient wisdom of
TM

Thank you!