



From wisdom of Ancient India to the global food and healthcare markets - can India make it?

Dr. Viloo Morawala-Patell
Founder, Chairperson & Managing Director
AVESTHAGEN LIMITED

Fourth World Conference on the Future of Science
Venice, September 26, 2008

From the wisdom of Ancient India



03 | bioNutrition



To the current Indian Healthcare Scenario

- *Fast growing sector with the healthcare spending expected to rise by 12% p.a*
 - *Healthcare spending expected to touch 8% of GDP by 2012*
 - *Imminent need for cutting-edge healthcare solutions*
 - ***Rapid adoption and adaptation of Technology is the main driver for trends and developments in Healthcare in India***
-
-



The Infrastructure Advantage

➤ **40 National Research Institutes**

15,000 scientists

➤ **300 life sciences colleges**

500,000 graduates per annum

➤ **120 medical colleges**

17,500 medical graduates per annum

➤ **200 biotech companies**

Employing 25,000 scientists in R&D

➤ **100 teaching hospitals**

Employing medical & paramedical professionals



INDIA : The changing environment

- Increasing availability of trained & skilled Human Resource: Returning Indian Scientists with Regulatory expertise
- Improving Regulatory infrastructure
- Improving standards of bio-manufacturing
- Increasing capabilities in clinical development
- Increasing R&D collaborations with US/EU companies
- Increasing acceptance of Indian clinical data by USFDA/ EMEA

Indian **BT** is rapidly climbing up the drug development path



INDIA : paving the road ahead

- **Discovery research: Transition from generics to new molecules**
- **Pre-clinical development: Large animal house facilities**
- **Regulatory infrastructure: GM Crops & NDAs**
- **Risk capital: Private and Public funding**
- **VC investment in innovation**
- **Specialized skills: IND development**

Innovation is replacing the generics and services mindset



Current Global Strategies

India's cost and skill base supports affordable drug development

India is fast attaining global leadership in Bt cotton cultivation

India is an emerging preferred hub for CROs & CMOs

Trans-national partnership models with Indian cos. is on the rise



INDIAN BIOTECHNOLOGY: 2007

ABLE-Biospectrum Survey

SEGMENT	REVENUES (2006-07)	% GROWTH	REVENUES (2005-06)	REVENUES (2004-05)
• BioPharma	~Rs 5600	20	4,700	3570
• BioServices	~Rs 1000	38	720	425
• BioAgri	~Rs 1100	50	580	330
• BioIndustrial	~Rs 400	20	375	320
• Bioinformatics	~Rs 130	20	110	100
• Total	Rs 8300	30	6,485	4745

- **Biotech industry touches \$2 billion (\$1.45 billion).**
- **BioPharma sector crosses \$1.4 billion (\$1b).**
- **BioServices sector touches \$250 million.**
- **BioAgri sector crosses \$250 million.**
- Industry grows at 30 percent .
Bio-agri scores globally with highest global growth rate @ 50% and largest acreage (9 million)

**Industry Revenues Cross US \$ 2 Billion
Doubles from \$ 1 Billion in 2004-05
On track to meet \$5 billion by 2010**



INDIAN BIOTECHNOLOGY: 2007

ABLE-Biospectrum Survey

INVESTMENT GROWTH

YEAR	INVESTMENT (Rs: crores)	GROWTH
FY 2000-01	Rs. 250	--
FY 2001-02	Rs. 504	101%
FY 2002-03	Rs. 635	26%
FY 2003-04	Rs. 850	34%
FY 2004-05	Rs. 1215	43%
FY 2005-06	Rs. 1650	36%
FY 2006-07	Rs. 2270	37%

- Investment crosses \$580 million in 2006-07
- Bangalore alone saw > Rs:1000 crores investment (Biocon, Jubilant, Advinus, AstraZeneca, GE Healthcare, Avesthagen, Agilent, SRA Security)
- Biotechnology Companies R&D spend at an average 3% of Sales.



THE BIO-SCENARIO: INDIA 2007

- E&Y ranks India No:3 after Japan & Korea in the Asia Pacific Region in Biotechnology.
- **M&A**
- Reliance Life Sciences acquires 74% stake in GenMedix, Nicholas Piramal acquires UK's Avecia Biopharma, Biocon acquires IP assets of US based Nobex Corp.
- Merriex Alliance picks up 60% stake in Shantha Biotechnics for global vaccine production
- **PARTNERED RESEARCH**
- Advinus inks \$150 million research deal with Merck
- Biocon co-develops Intranasal Insulin with Bentley Pharma, USA.
- **INVESTMENT**
- Avesthagen attracted €20 million from a leading European VC fund
- **INNOVATION**
- Biocon launched BIOMAb EGFR as India's first proprietary biotech drug for head and neck cancers
- Biocon announced commencement of Phase II trials for: Oral Insulin and Anti-CD6 MAb for RA.

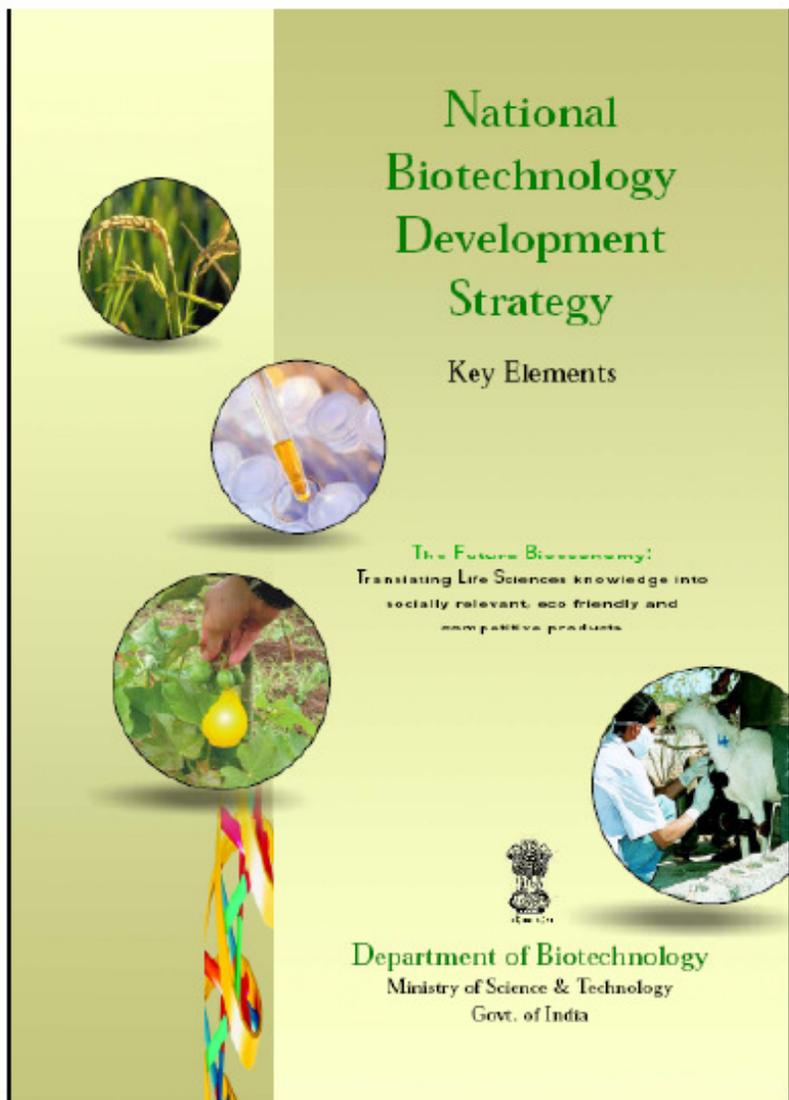
**THE INDIA INVESTMENT MODEL:
M&A & PARTNERING FOR GLOBAL COMPETITIVENESS**



National Biotechnology Development Strategy

Key Elements

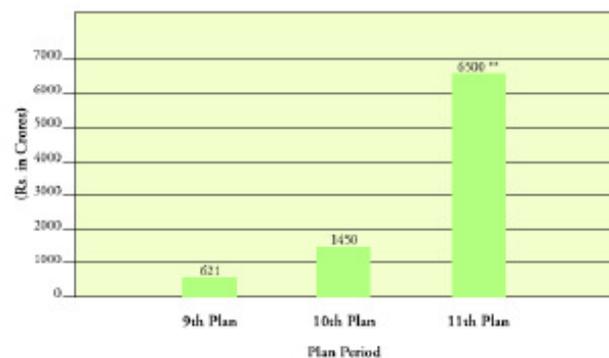
The Future Bioeconomy:
Translating Life Sciences knowledge into
socially relevant, eco friendly and
competitive products




Department of Biotechnology
 Ministry of Science & Technology
 Govt. of India

DBT's Funds

Availability of Funds for DBT through the Plans*



**6500crore rupees ~ \$1.7billion



Government of India

DBT

DEPARTMENT OF BIOTECHNOLOGY

Nov 2007



Conclusions



- India has an innovative & growing Biotech Industry
- Increasing Global linkages with companies in Europe and United States.
- Cost effective collaborative research, development & manufacturing provides benefits to people globally.
- There here is a strong culture of regulation and compliance
- The Industry is aware of evolving international trends in biosafety and biosecurity
- Ease of international audit due to strong English language based systems.
- Partnership with Government.



AVESTHAGEN

BRINGING SCIENCE TO LIFE



Who we are

An innovative and diversified globally-focused biotechnology company based in India that is developing new products and novel technologies in the fields of bionutrition, biopharmaceuticals, bioagriculture, and predictive, preventive and personalized healthcare.



Through our disciplined and prolific R&D efforts we are developing novel products that are designed to treat, predict, and prevent chronic disease and address hunger and energy limitations around the globe

AVESTHAGEN LIMITED



Our Achievements – Making Science Work

~Euro 40 million raised since inception

- Three operating divisions created through our prolific Science and Innovation platform
- Revenue generating business with Rs. 660 million in revenues (FY '08 unaudited)
- Exceptional pipeline of products with significant market potential
 - bioNutrition:** 26 products in the pipeline; 15 'near-term' launches; 1 product already commercialized
 - bioPharmaceuticals:** 8 products in pre-clinical with the first Indian commercialization planned for late 2009
 - bioAgriculture:** Existing seed business with approved technologies and deep pipeline of products
- Positioned ourselves as “partners of choice” for global industry players – strong partnerships in place
- Fully integrated organization with 668 employees
- Proven ability to productively utilize funds and create shareholder value

Avesthagen, with the successful completion of the proposed IPO,
is poised to move its business to the “next level”



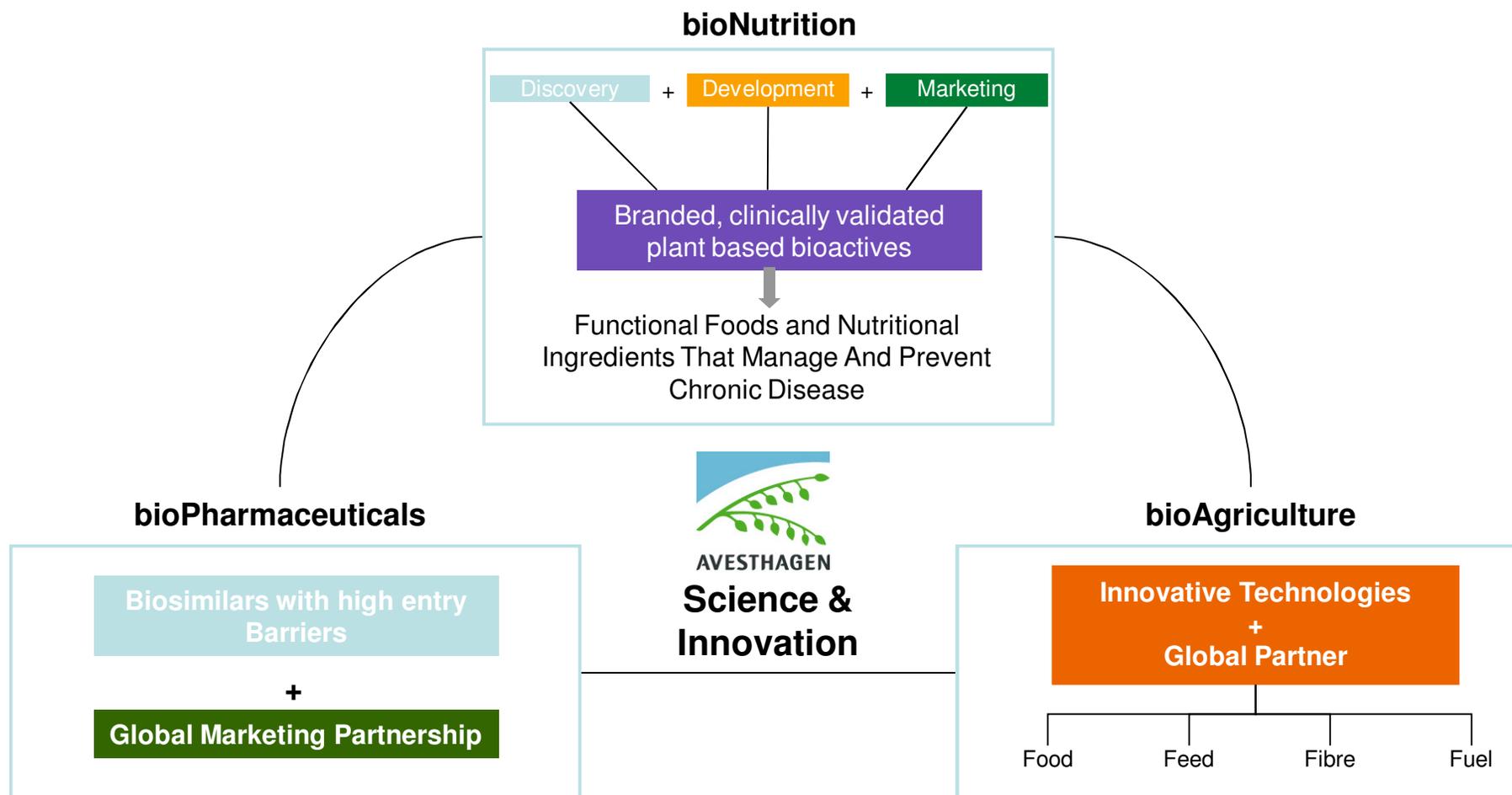
Investment Highlights

We are a pioneer in the field of Bionutrition, Biopharmaceuticals, and Bioagriculture

- Diversified, reduced risk, business model**
- Multiple pillars of growth**
- Prolific R&D platform poised to generate multiple near term and long term innovative product opportunities**
- Blue chip investor base and validating partnerships with industry leaders**
- Strong Intellectual Property positions**
- Highly experienced scientific and management team**

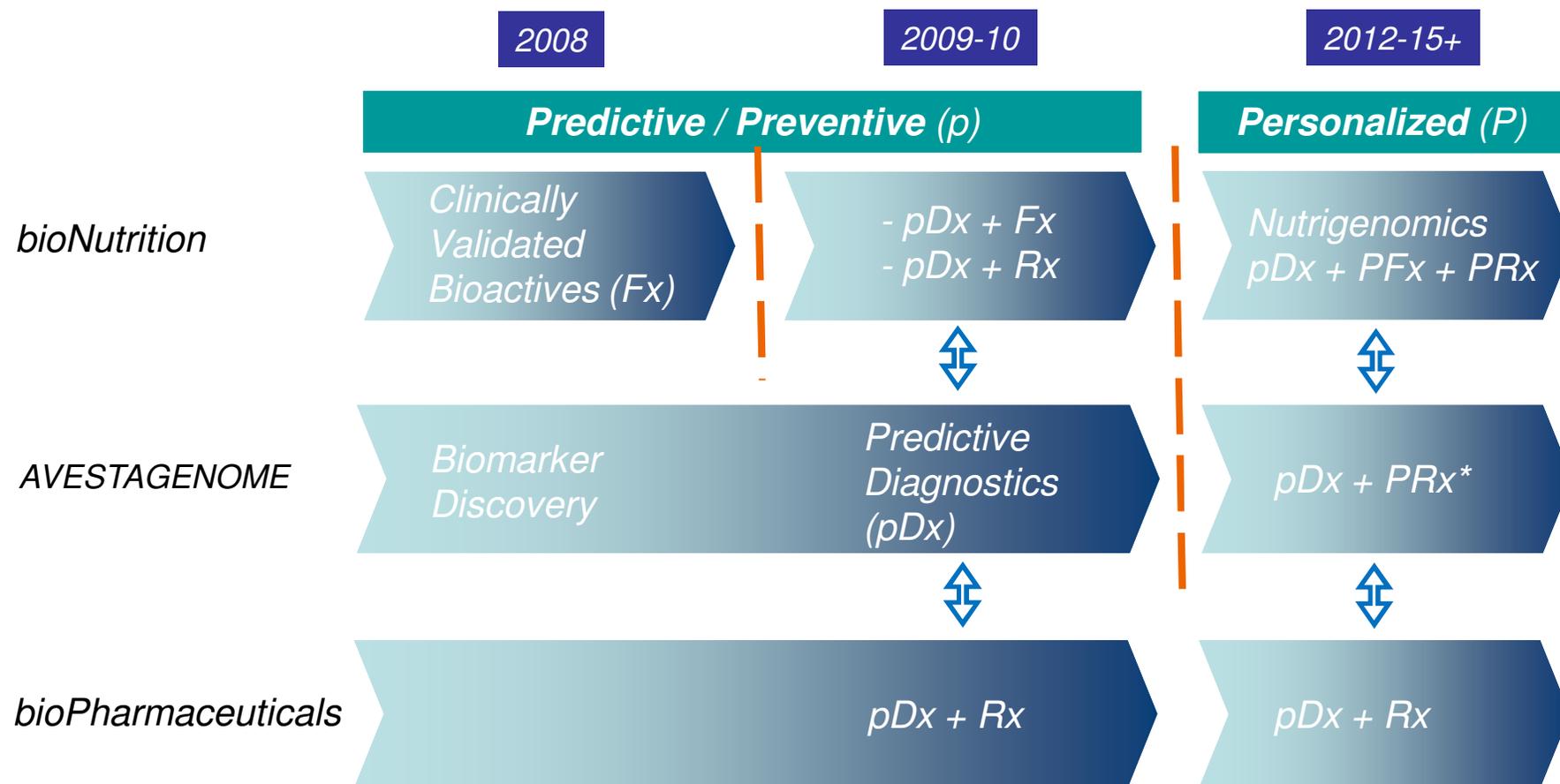


Science & Innovation Drives Our Unique and Diversified Business Model





Moving towards personalized healthcare



* Includes biopharmaceuticals and bioactives products
 Dx: Diagnostics; Rx: Prescription; Fx: Functional food



Mission Statement

Convergence of Food and Pharma

To discover, develop and market branded, clinically validated, plant based bioactives as “functional foods” and as dietary supplements which are intended to aid in the prevention and management of chronic and degenerative diseases.

To combine nature, tradition and technology to create quality ingredients that meet consumer needs for great taste, improved nutrition and disease prevention, cost effectiveness and environmental stability.

Our goal is to incorporate great-tasting, life-enhancing natural ingredients into the world's everyday food menu.



Business Overview

- ❑ Leveraging our wide scientific capability to convert herbal extracts and botanical biomass from traditional Indian medicine into clinically-validated products
- ❑ State of art ISO 9001 & ISO 22000 certified manufacturing capability producing 26 bioactives offering customized products to match customer needs
- ❑ Bioactives for use in our Functional Foods like crackers breakfast cereals, snack bars, bakery products, staple foods, fruit and dairy based beverages.
- ❑ Commercialization strategy with a strong branding and OTC focus to create champion brands initially in India, US, Middle East and then worldwide.



Proprietary Tools

ADePt™

- ❑ A repository created by Avesthagen, which serves as a systems biology platform for integrated access to medicinal plant research.
- ❑ A comprehensive source on plants having medicinal value containing a vast array of information including genomic, proteomic, tissue culture, metabolomic, ethnobotanical, patent and related literature on each plant
- ❑ Provides a broader access to medicinal plants through its high-throughput analytical techniques, simulation tools and an advanced query system and context mapping tool
- ❑ Enables the improvement and rationalization of traditional medical practices that are based on the use of medicinal plants and also contains in-house experimental data from bio-assays, MetaGrid™, preclinical data generated for various bioactives
- ❑ The database contains information on 3,000 medicinal plants and more than 15,000 compounds



Proprietary Tools

MetaGrid™

- ❑ Avesthagen's proprietary MetaGrid™ technology enables the accurate standardization of multi-constituent plant extracts and redefines phyto-fingerprinting protocols
- ❑ Other metabolite profiling methods often focus on less than 10 metabolites that occur in significant proportions out of several thousand metabolites. This narrow focus solely on major constituents does not address batch-to-batch variations in bioactivity, particularly when the minor constituents also contribute to the observed bioactivity
- ❑ Utilizes novel algorithms and enables the standardization of operating procedures, permitting adequate and uniform standardization and a quantitative estimation of metabolites at a comprehensive level
- ❑ Another beneficial application may be to the clinical research community, which works with finely calibrated and uniformly standardized supplements



Key business strategies

- Exploit our proprietary technologies to identify bioactive extracts which may be clinically validated to address a chronic disease or condition in a commercially attractive end market
- Continue to expand and leverage our Good Earth and Avesta brands to commercialize functional food products and bioactive ingredients, which can prevent or manage chronic diseases
- Partner with global leaders, such as Danone, to penetrate markets outside of India
- Globally launch Functional Foods containing the scientifically and clinically validated bioactives under Avesthagen's brands



Targeting Special Niches in the Global Consumer Healthcare Market

Functional foods

The global market is estimated to be **USD 85 billion** in size in 2006, growing at a rate of 8-9% p.a. USA, Europe and Japan are the largest markets for functional foods.

Dietary supplements

The global market for dietary supplements is estimated at **USD 68 billion (2006)**, and is exhibiting a growth rate of 4-5% per annum. The US is the largest market for dietary supplements, with an estimated market size of USD 22 bn.

Global functional ingredient sales

Global ingredient sales are estimated at **USD 9.4 billion** for 2006. This constitutes USD 7.6 bn. as supply to the supplement market, and USD 1.8 billion as supply to the functional food market.

Source: Nutrition Business Journal November 2007



Functional Food Sales by Region (in US\$ mm)

Country	2004	2005	2006
USA	26,210	28,500	31,400
Europe	22,219	23,503	24,955
Japan	17,895	19,508	19,439
Canada	2,162	2,335	2,533
Rest of Asia	2,382	2,685	2,960
LatAm	588	661	727
Aust/ NZ	935	1,056	1,146
EE/ FSU	670	825	970
Mid East	353	417	477
Africa	316	360	405
Total	73,729	79,400	85,013

Source: Nutrition Business Journal



Market Drivers

We believe our products and product candidates that target the consumer healthcare market benefit from a number of growth trends in the industry :

- An increasingly ageing population*
- The increasing cost and awareness of healthcare*
- The growing trend towards self-medication*
- The growing consumer interest in alternatives to pharmaceuticals*
- Nutrition is being increasingly recognized as a major avenue for healthcare*
- Consumer is increasingly aware of the linkage between health and nutrition*
- The Dietary Supplement and Health and Education Act (DSHEA) in the US*

→ **Product Pipeline - Diabetes**

Brand Name	Clinical Status	Functionality	Launch date - Market	Food Application	Manufacturing Partner	Distribution Partner
Teestar™	Clinical trials completed	Glucose modulator	<ul style="list-style-type: none"> • Launched in India - May 2008 • Dec 2008 Global 	Crackers	AGEF	AGEF & other global partners
Cincata	Clinical trial Protocols completed	Insulin mimetic and sensitization activity	<ul style="list-style-type: none"> • Oct, 2008, India • Oct 2009 Global 	Beverage and snacks	To be identified	To be identified
Aspand™	Clinical trial Protocols completed	Insulin sensitization activity	<ul style="list-style-type: none"> • Oct, 2008, India • Oct 2009 Global 	Beverage and snacks	AGEF	AGEF + other International
Govad™	Pre-clinical trials completed	Insulin mimetic and sensitization	<ul style="list-style-type: none"> • April, 2009, India • April 2010 Global 	Snacks and beverages	To be identified	To be identified
Gosh™	Pre-clinical trials completed	Insulin mimetic and sensitization activity	<ul style="list-style-type: none"> • April, 2009, India • April 2010 Global 	Snacks and beverages	To be identified	To be identified
Senin	Pre-clinical trials completed	Insulin mimetic and sensitization	<ul style="list-style-type: none"> • April, 2009, India • April 2010 Global 	Snacks and beverages	To be identified	To be identified



Product Pipeline – Bone Health

Brand Name	Clinical Status	Functionality	Launch date - Market	Food Application	Manufacturing Partner	Distribution Partner
	Clinical trials Protocol Ready	Reduces bone resorption and cartilage degradation	<ul style="list-style-type: none"> • Oct, 2008 India • Oct 2009 Global 	Snacks and Beverage	AGEF	AGEF + other International
	Clinical trials Protocol Ready	Bone formation and reduces bone resorption	<ul style="list-style-type: none"> • Oct, 2008, India • Oct 2009 Global 	Beverage, Dairy and snacks	AGEF Danone March 2010	AGEF + other International Danone March 2010
	Pre-clinical trials completed	Bone formation activator	<ul style="list-style-type: none"> • April, 2009, India • April 2010 Global 	Beverage and snacks	To be identified	To be identified
	Pre-clinical trials completed	Bone formation, reduces bone resorption and cartilage degradation	<ul style="list-style-type: none"> • April, 2009, India • April 2010 Global 	Snacks and beverages	To be identified	To be identified



Product Pipeline – Cardiovascular Health

Brand Name	Clinical Status	Functionality	Launch date - Market	Food Application	Manufacturing Partner	Distribution Partner
PomPlex™	Pre-clinical trials completed	Lowers cholesterol, Lowers triglyceride	<ul style="list-style-type: none"> •Oct, 2008, India •Oct 2009 Global 	Snacks and Beverage	AGEF	AGEF + other International
SMART CHOL	Pre-clinical trials completed	Lowers cholesterol	<ul style="list-style-type: none"> •Oct, 2008, India •Oct 2009 Global 	snacks	AGEF &	International distribution
DHA	Process Development completed	Cardio Vascular Health Cognition	<ul style="list-style-type: none"> •April. 2009 India •Oct. 2009 Global 	Snacks and Beverage	AGEF	AGEF + other International



Product Pipeline – Cosmetology

Brand Name	Clinical Status	Functionality	Launch date - Market	Application	Manufacturing Partner	Distribution Partner
 XanoMax [®]	In vitro studies completed	Anti ageing and anti wrinkle	<ul style="list-style-type: none"> •April 2009, India •Oct 2009 Global 	Cosmetics Skin and Body care	To be identified	To be identified
 AmlaPure [™] ORGANIC	In vitro studies completed	Anti ageing and anti wrinkle	<ul style="list-style-type: none"> •Oct, 2009, India, •April 2010 Global 	Cosmetics Skin and Body care	To be identified	To be identified
 HibiX [™]	In vitro studies completed	Anti ageing and anti wrinkle	<ul style="list-style-type: none"> •Oct, 2009, India, •April 2010 Global 	Cosmetics Skin and Body care	To be identified	To be identified



Product Pipeline – Weight Management

Brand Name	Clinical Status	Functionality	Launch date - Market	Food Application	Manufacturing Partner	Distribution Partner
	Invitro assays Completed	Reduction in fat absorption	<ul style="list-style-type: none"> •April 2009 India •April 2010 Global 	Snacks and Beverage	To be identified	To be identified
	Invitro assays Completed	Alpha Amylase inhibitor	<ul style="list-style-type: none"> •Oct . 2009 India, •Oct. 2010 Global 	Beverage and snacks	To be identified	To be identified
	Invitro assays Completed	Reduction in fat absorption Alpha Amylase inhibitor	<ul style="list-style-type: none"> •April 2010 India, •April 2011 Global 	Beverage and snacks	To be identified	To be identified

→ Product Portfolio overview

Functional foods marketed under the "Good Earth" brand

- ❑ An extension of Avesthagen's "Food-for-Medicine" program
- ❑ Functional foods - "Avesta Inside". Clinically validated bio-actives integrated into convenient delivery formats
- ❑ Whole-wheat crackers with Teestar™
 - Clinically validated
 - Reduces blood glucose
 - Maintains optimum body weight
 - Zero trans fat
 - Launched in May 2008
- ❑ Teestar incorporated atta / ready-mix to be launched by Sep/Oct. 08
- ❑ Other products on the horizon to address conditions like Diabetes, Cardiovascular disease and Bone loss as well as Weight-management

Teestar™



➔ Product Portfolio overview

OTC bioactive ingredients marketed under the Avesta™ brand in USA

- Organic Amla – add to beverages
 - Anti-oxidant superfruit
 - WinterWell
 - Effective cold & flu formula
 - Gymnema
 - Blood sugar regulation
 - Triphalax
 - Gentle herbal laxative
 - ThinkWell
 - Fast acting brain formula
 - Mangosteen
 - Superior antioxidant
 - Ashwagandha
 - Stress, stamina & healthy aging
 - Boswellia
 - Healthy inflammatory response
- We plan to launch selected above products in India by end-2008





bioAgriculture

Agriculture represents 22% GDP

126 million farming families in Primary Agriculture

234 million in Agriculture sector

Average Farm size 1.41 Ha

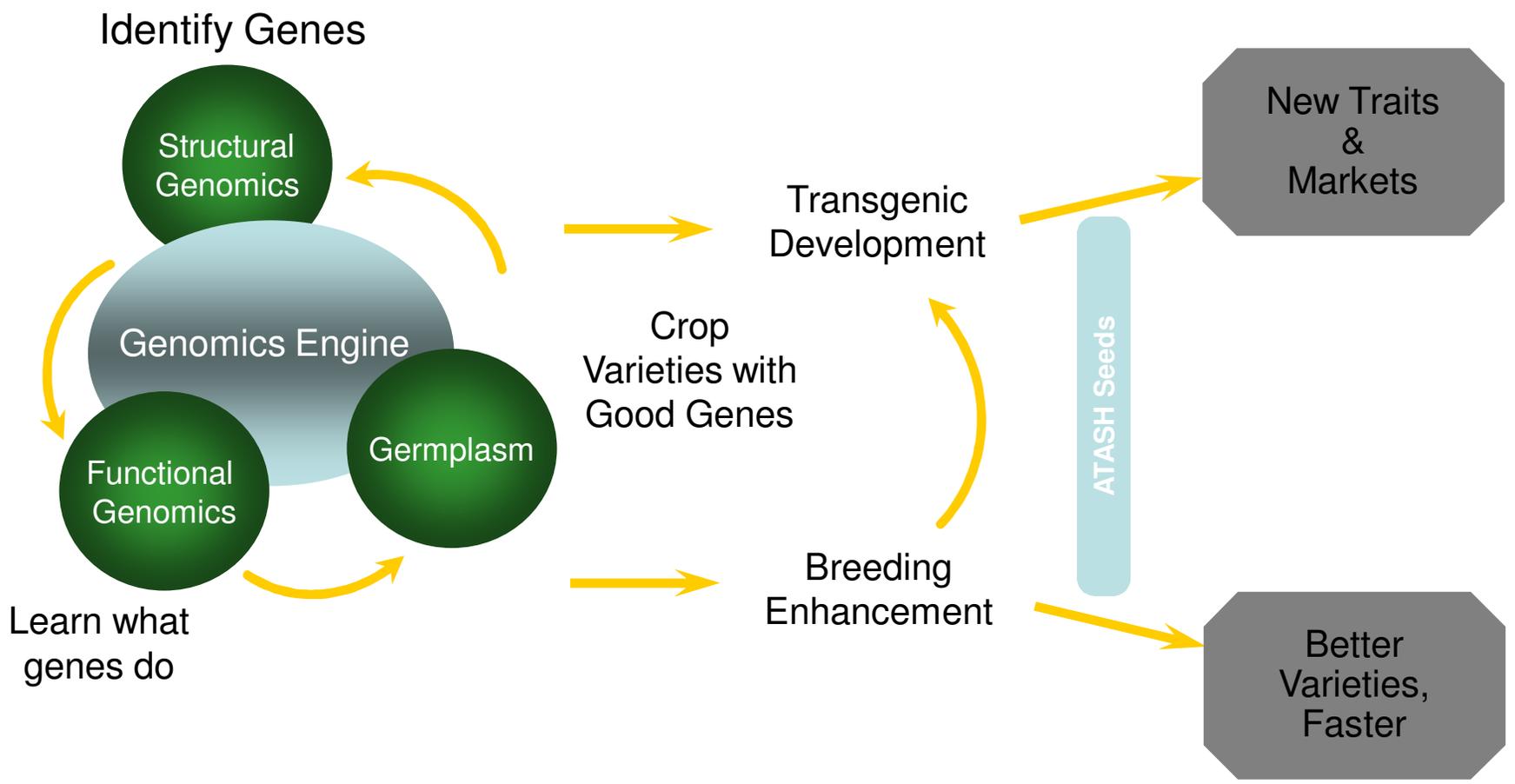
90% Production - domestic use

Export - \$6.0 billion (1.5% of total exports)

700 million people living in 683,000 villages

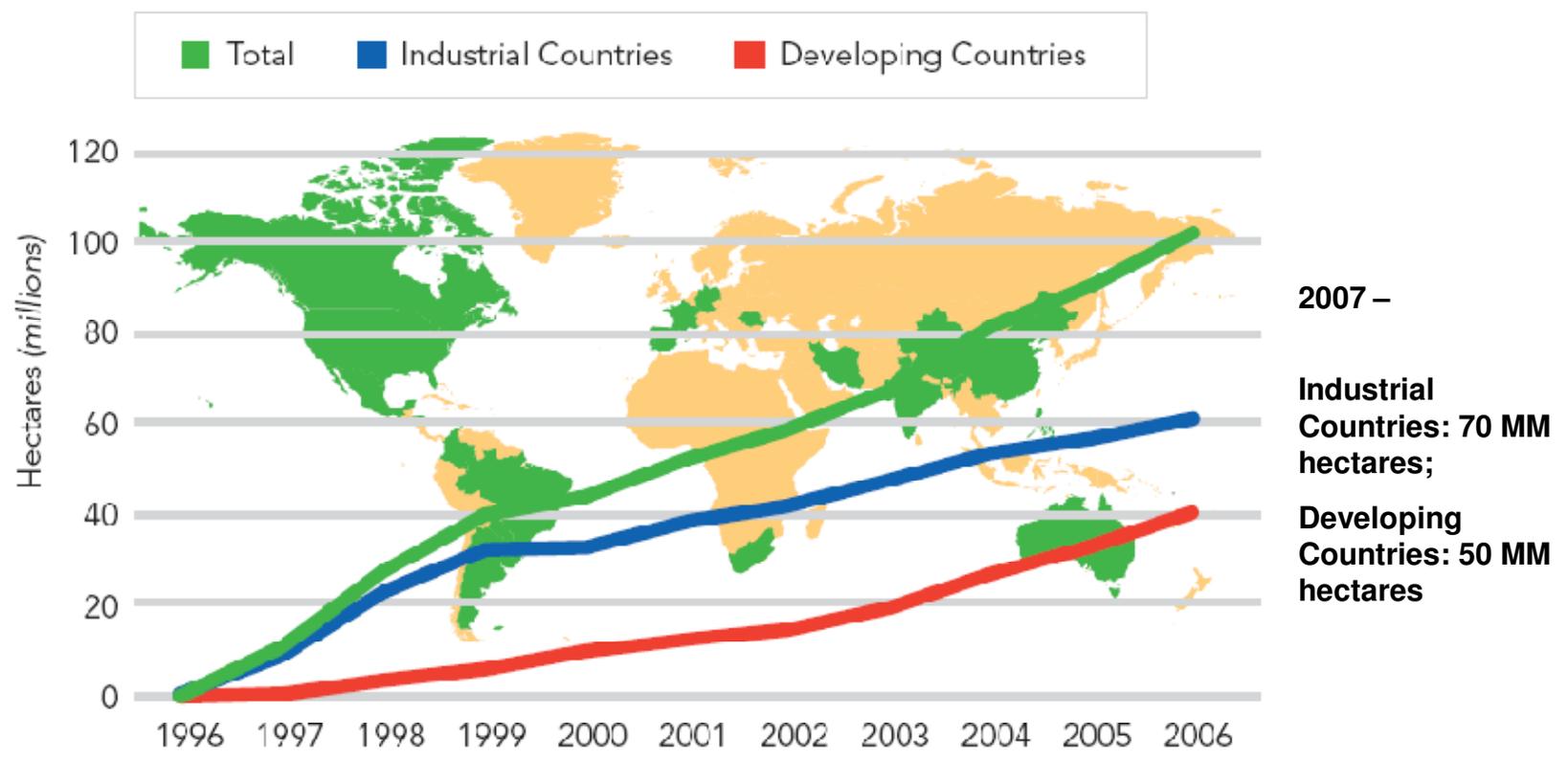


Focused on developing GM & non-GM crops





Target Market Size for GM Seeds - US\$ 6.8 billion



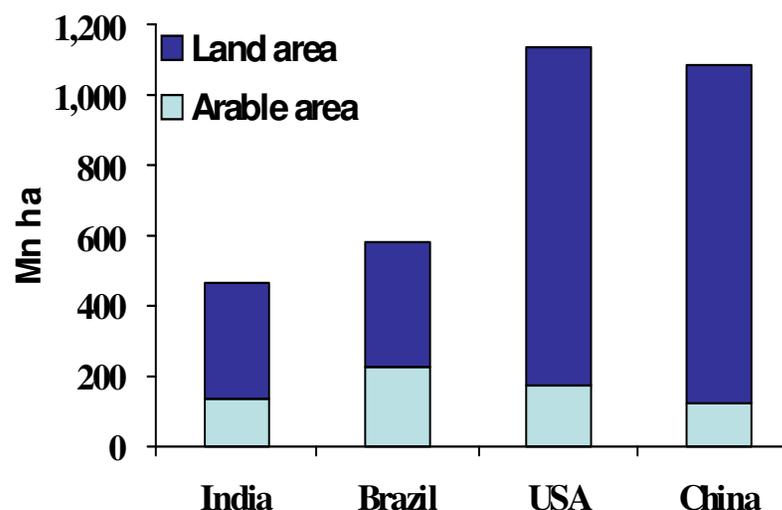
Note: Increase of 13%, or 12 million hectares (30 million acres between) 2005 and 2006.

Source: Clive James



Indian Seeds Market

- ❑ With a size of US\$1.5 billion, India is the fifth largest commercial seed market in the world
- ❑ Arable land is around 136 million hectares which is higher than China
- ❑ High growth expected on the back of transition from traditional varieties to high value varieties, hybrids and transgenic crops
- ❑ Public sector – varietal crops like paddy, wheat, pulses – 80% of seed volume; 40% of total value
- ❑ ~ 150 companies in private sector – majority operates as traders



- ❑ Increase in India's share in world crops can come from improved productivity as growers shift to hybrids and transgenic plants



Product Pipeline

Drought-FIT™

Drought tolerant Indica Rice (MAB) *

- Checked in All India Trials
- Best Material so identified for drought tolerance
- Currently in mass production
- Variety Product launch in India in 2008
- Hybrid Product Launch in Indian in 2011
- Rice Variety seed market is Rs. 17.6 billion
- Rice Hybrid seed market is Rs. 2.4 billion

Source: www.irri.org/science/rice stat

* Acquisition through membership of Seed Consortium



Product Pipeline

Nutrition-FIT™

High Anti oxidant Rice (Non GM)

- Collection of over ninety lines
- Currently in field for multiplication
- Analysis for antioxidant content, 2008
- Large scale cultivation, 2008
- High antioxidant Rice based product, 2009
- Global Market Launch in 2009
- According to estimates of the USA Rice Federation, total rice production in the US for 2008 will be 423 million tons, of which 25% would be specialty rice
- 30% of specialty rice is estimated to be colored rice i.e. 31.7 million tons



Source: USA Rice Federation



Product Pipeline

Hybrid-FIT™

Pigeon Pea Hybrid ICPH2671(AH701) *

- Public-private collaboration
- 20-30% higher yield than “check Maruti”
- Resistance to major diseases such as wilt and sterility mosaic
- Hybrid is well suitable for light vertisols
- Hybrid seed color is dark brown and size of seed is equal to check
- Drought tolerance
- Year of Launch in India: 2009
- Pigeon Pea Seed Market Tonnage for India: 1.4 million MT
- Pigeon Pea Seed Market Value for India: Rs. 3.5 billion

Source: ICRISAT

* Acquisition through membership of Seed Consortium



Product Pipeline

TO BE BRANDED

Pearl Millet New Hybrid (AH557) *

- Extra Early hybrids which mature in 70 days
- High yielder than local checks in Extra early segment
- Resistant to Downey Mildew
- Grain color is grey with conical compact head
- Non lodging
- Medium Plant Height, Profuse and uniform tillering
- Year of launch in India: 2010
- Pearl Millet Seed Market Tonnage for India: 15,000 MT
- Pearl Millet Seed Market Value for India: Rs. 230 million

Source: ICRISAT

* In-licensed by Avesthagen from ICRISAT



Product Pipeline

Nutrition-FIT™

High Lycopene Tomato



- Analysis for antioxidant content, 2007
- A range of 250-500% increase in Lycopene
- Currently analysing fruits of third generation
- Selection of plant and tissue culture, 2008
- Permission for Protected Cultivation trial, 2008
- Large scale Greenhouse cultivation, 2009
- High Lycopene tomato puree product development, 2009
- GM Lycopene product development, 2009
- Market Launch 2011
- Market Size 2009 for lycopene sales: ~US\$26 million

Source: Frost & Sullivan



Product Pipeline

Drought-FIT™

Single gene Japonica rice (GM)

- Four Generations Checked in Greenhouse
- Strip trials permission to RCGM, 2008
- Large Scale Field Trail, 2009
- Commercial Seed Production 2010
- Launch of GM drought tolerant Transgenic Japonica rice, 2011
- Estimated market for drought tolerant variety, US\$ 625 million in India

Source: ABSPII, USAID

bioAgriculture



Product Pipeline

Hybrid-FIT™

Male Sterile slender long grain rice ~ 2010

Male Sterile Tomato ~ 2011



Collaborations



- R&D collaboration
- Several projects have been short listed for joint development starting from markers for breeding, tissue culture related protocol development and GM crop research
- Marketing arrangements with Limagrain group companies such as Clause Seeds
- Research cooperation for the development of high oil corn in tropical maize
- Several projects across the globe for high oil corn breeding in temperate corn
- Avesthagen has a collection of corn germplasm with high oil content for use in this program.



ATASH Seeds



- ❑ Established in 2006 as Atash Seeds Private Limited under the Indo-French Partnership initiative.
- ❑ Started as a 50:50 Joint Venture Between Avesthagen & Vilmorin & Cie (Groupe Limagrain)
- ❑ Currently, Atash Seeds is a wholly-owned subsidiary of Avesthagen Limited focusing on trait value enhancement with diversification into varieties, hybrids and vegetable seeds
- ❑ Atash is a unique seed business model in India driven by technology
- ❑ Atash achieved growth of 100% in year 1 and exceeded first year turnover in the first quarter of the second year (08-09) with consistent profitability
- ❑ We hope to be India's #1 seed company in the next five years



ATASH Seeds



atash
SEEDING GROWTH

ATASH SEEDS

A Product of Bio Technology and Latest Research

First Demand of Indian Farmers

A Research Product of
Atash Seeds Pvt. Ltd.
A Company of Avesthagen Limited

Avesthagen Seed Promise:

“To build credibility with farmers and commitment to excellence while growing as a profitable enterprise”



India Specific Problems

- **Malnutrition**
- **Undernourishment**
- **Micronutrient deficiency**
- **Anemia in women & children**
- **Strict consumer preferences**

*These problems can be solved by
Agriculture biotechnology based solutions*



Indian Industry Scenario

Key Facts

- ❑ Indian Biotech Industry Size : Rs. 85.41 billion
- ❑ Biopharma continues to be the largest contributor to the sector with 70% share
- ❑ Exports account for 61% of the total sales

Key Highlights

- ❑ The global biotech industry size in 2006 was USD73.12 billion, whereas the Indian biotech industry crossed the USD2.18 billion (INR85.41 billion) mark in 2006-07
- ❑ India is counted among the top 12 global biotech hotspots and is the 3rd largest in Asia Pacific (in terms of number of biotech companies)
- ❑ Therapeutics is the fourth largest contributor to the sector. It accounted for 12 % of the total bio-pharma sales with INR. 7.25 billion in revenues. Therapeutics registered a growth of 13.28 % in 2006-07
- ❑ Most of the biopharma companies are focusing on discovery-led innovation and investing in infrastructure and R&D



Biosimilar Pipeline: Synergistic approach

Indication	Product
Rheumatoid Arthritis (Auto-immune disorder)	Product 1 / Product 9 / Product 5
Myocardial Infarction	Product 3
Non-hodgkins lymphoma	Product 5
B-cell-Chronic lymphocytic leukemia	Product 6
Breast cancer	Product 7
Colorectal cancer	Product 8 / Product 11
Non-small cell lung cancer	Product 8
Head & neck cancer	Product 11
Asthma	Product 10
Anemia (Cancer related or Chronic renal failure)	Product 2
Sepsis	Product 4



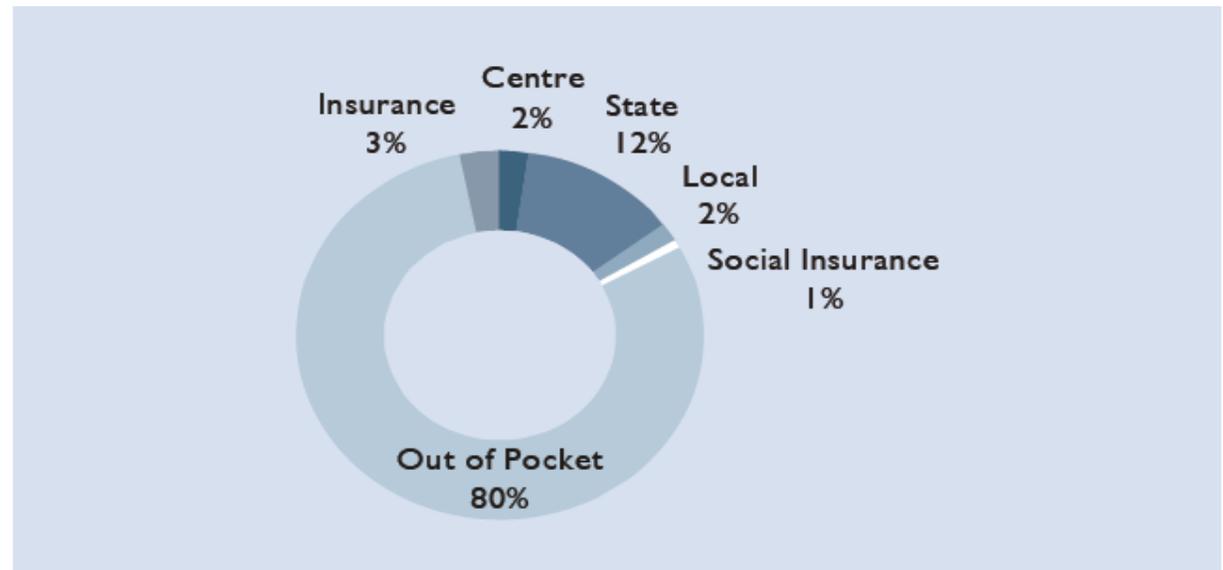
Indian Healthcare Scenario: In search of Cost-effective solutions

Biologics are typically 20 times more expensive than SCE drugs

Steep rise in healthcare costs world-wide

Cost-effectiveness will be key – Per capita medical expenditure in developing markets is 5 – 8 US \$ v/s 170 US \$ in developed markets

India: Healthcare payment breakdown

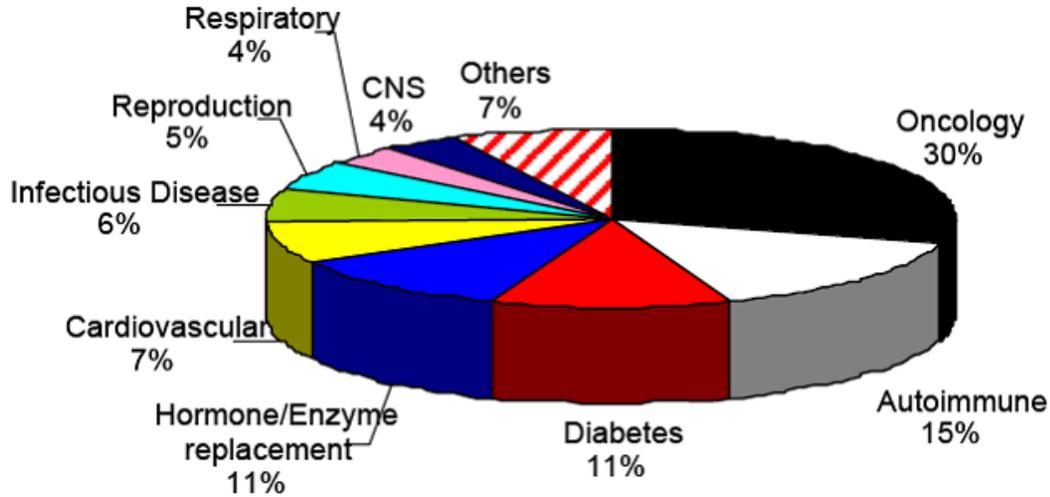


Source: CLSA Asia-Pacific Markets

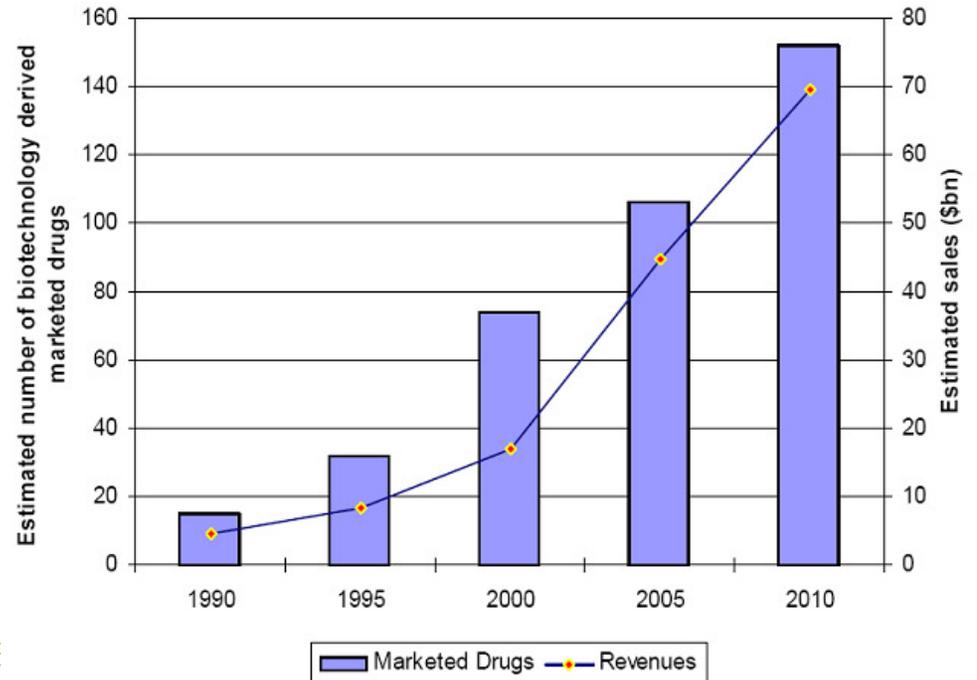
Biologics: Therapeutics segments & Market dynamics



Estimated number of biologic treatments approved in the US by major indication, 2003



Source: Business Insights, FDA, PhRMA Business Insights Ltd





Avesthagen leads global change

Biochemistry



Systems Biology

Therapeutics / Diagnostics



Theranostics

One Size fits all drugs



Personalized medicine

Treating Sickness



Preventing Sickness

Aging



Stem Cells Therapy

Food for survival



Food for health

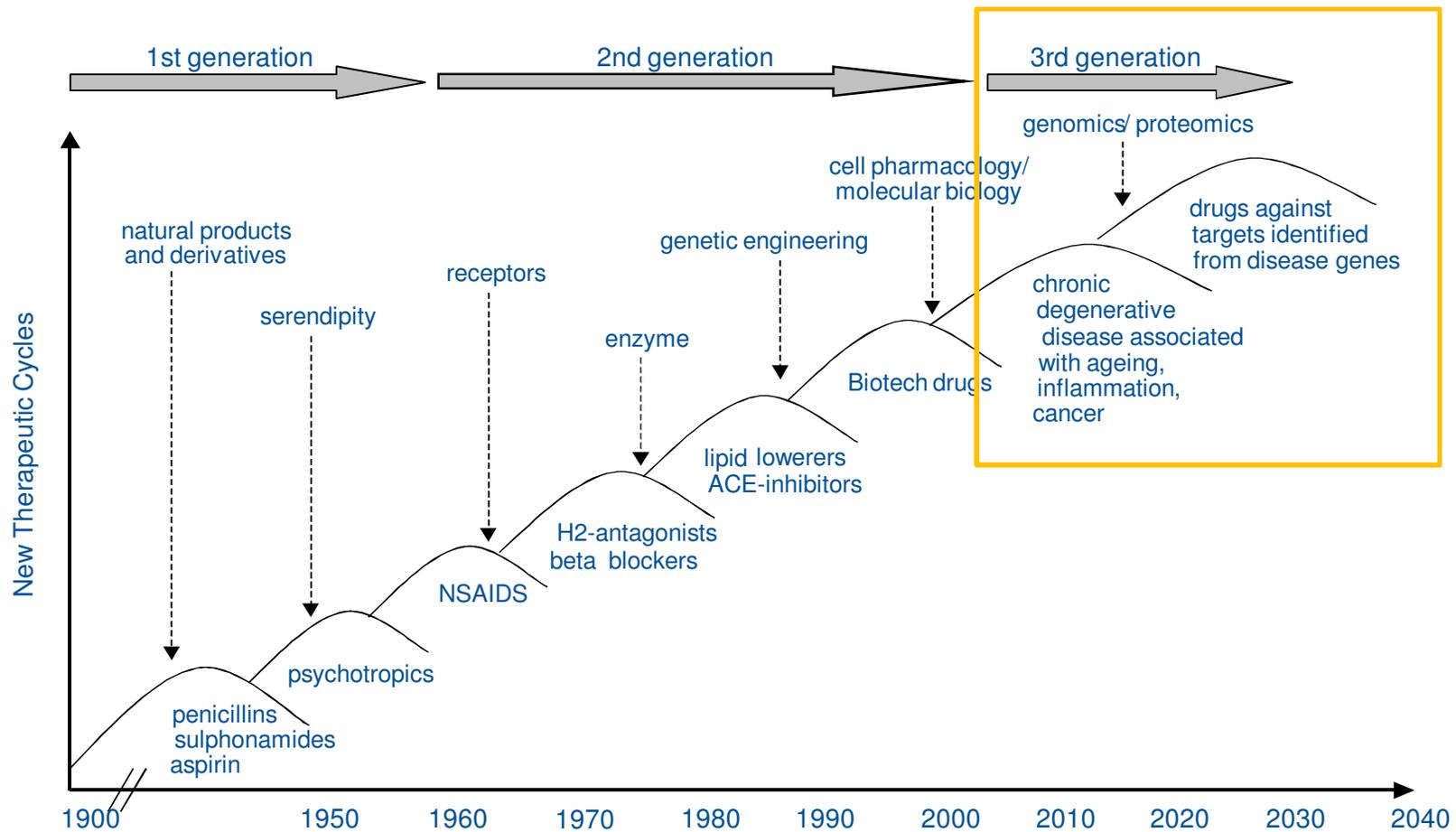
Fossil fuels



Alternative Energy



New Tools for Drug Discovery

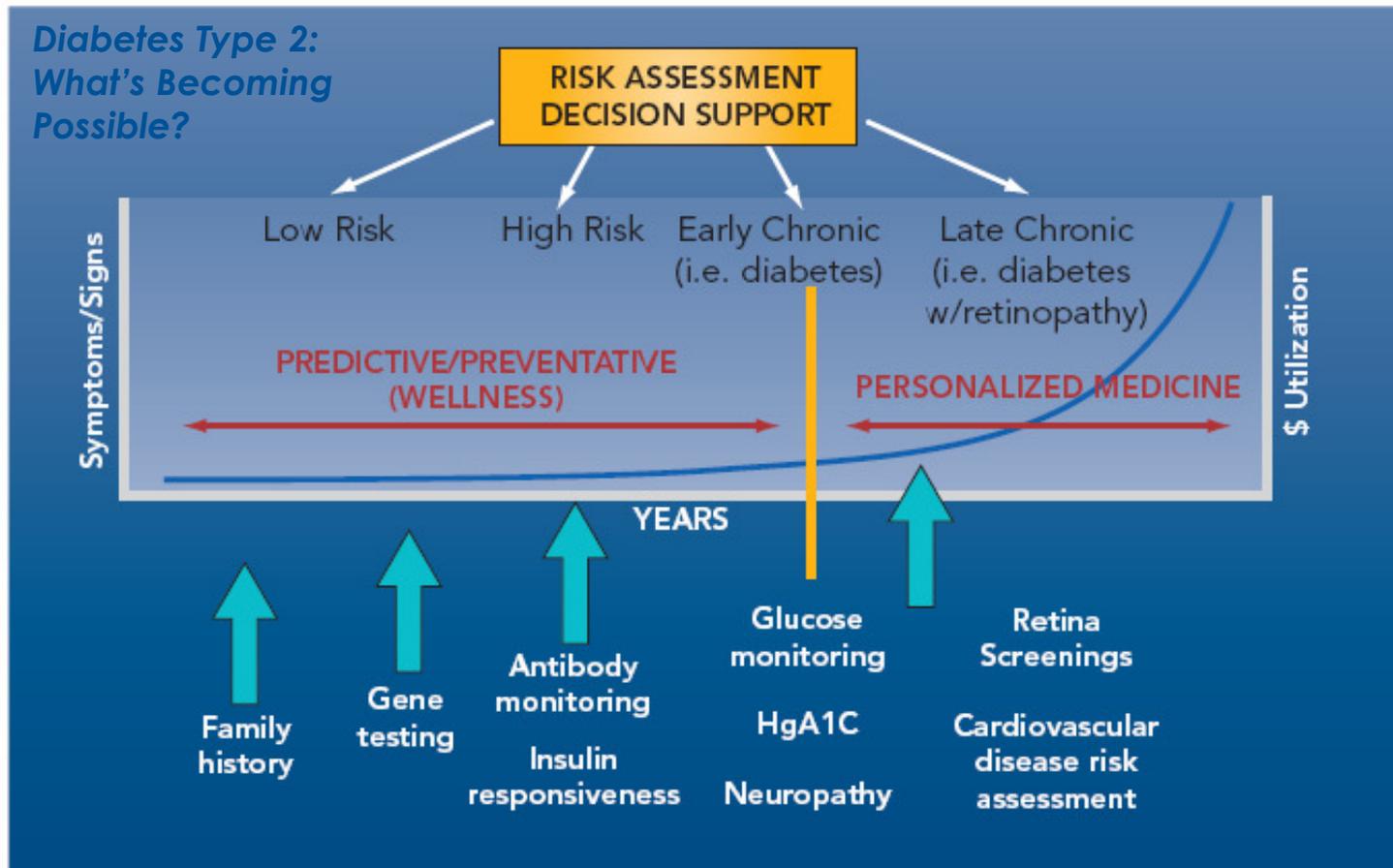


Source: CMS, Lehman Brothers research

Food – Pharma Convergence



Avesthagen | Product Development Strategy

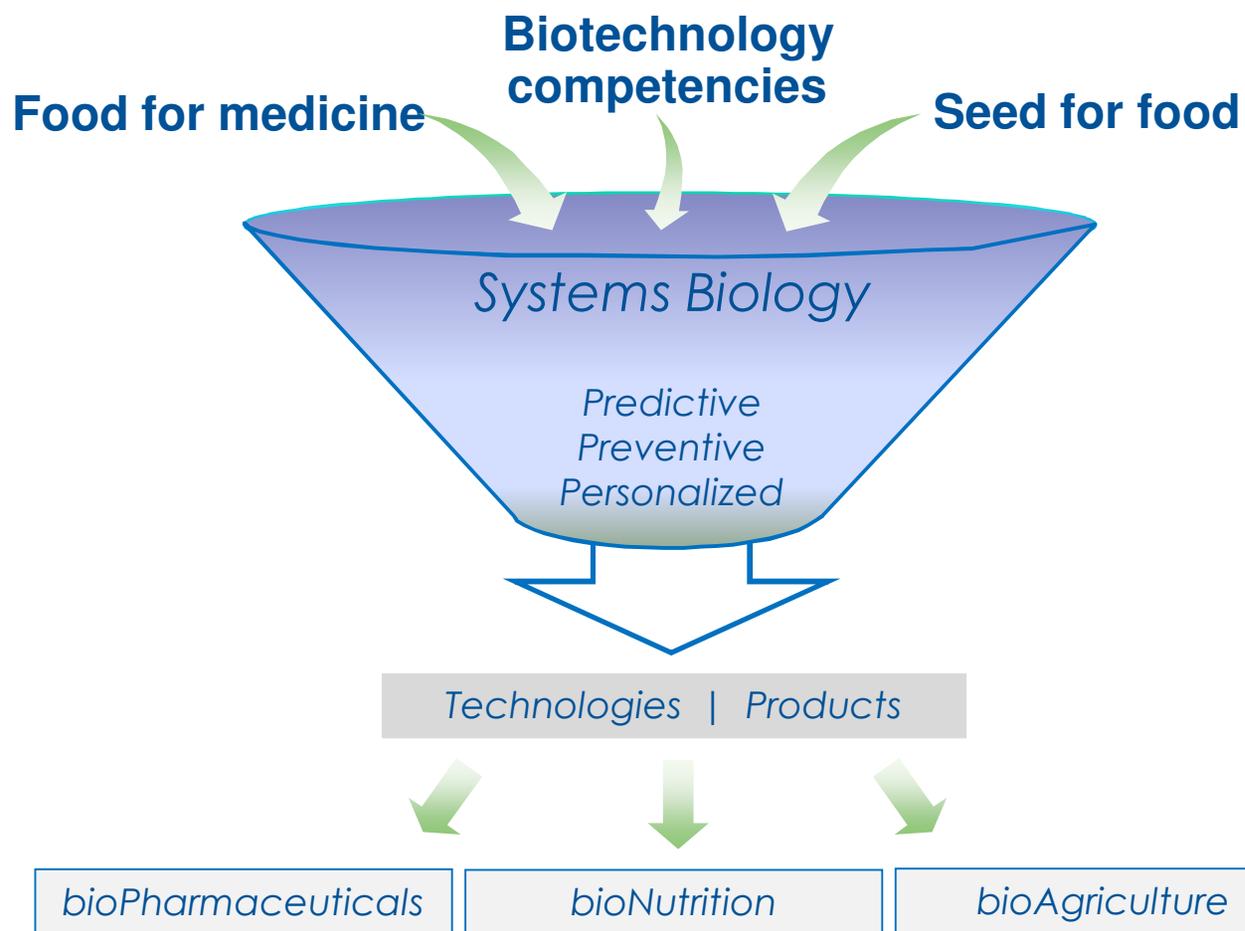


Source :
Burrill & Company

AVESTHAGEN LIMITED



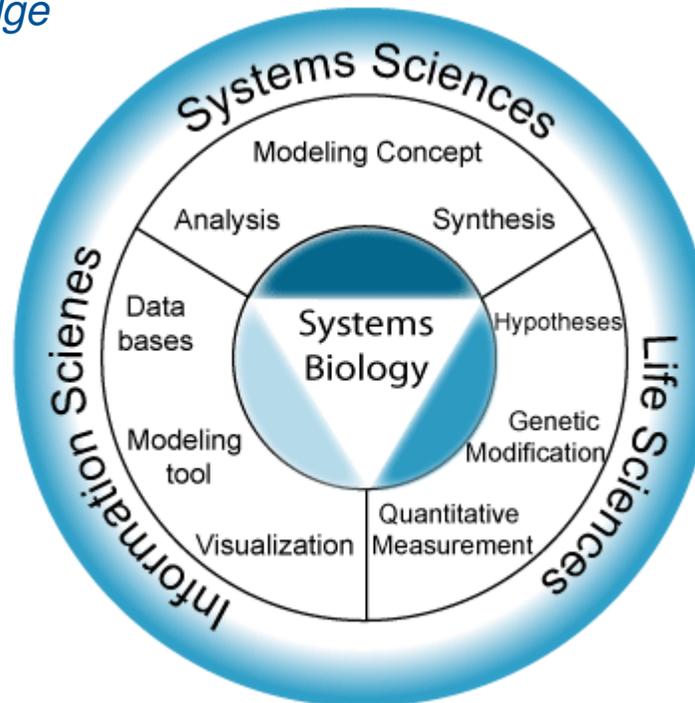
Driving Innovation through a Systems Biology approach





Systems Biology

*Confluence of Technology,
Tools and Knowledge*





The **AVESTAGENOME** ProjectTM

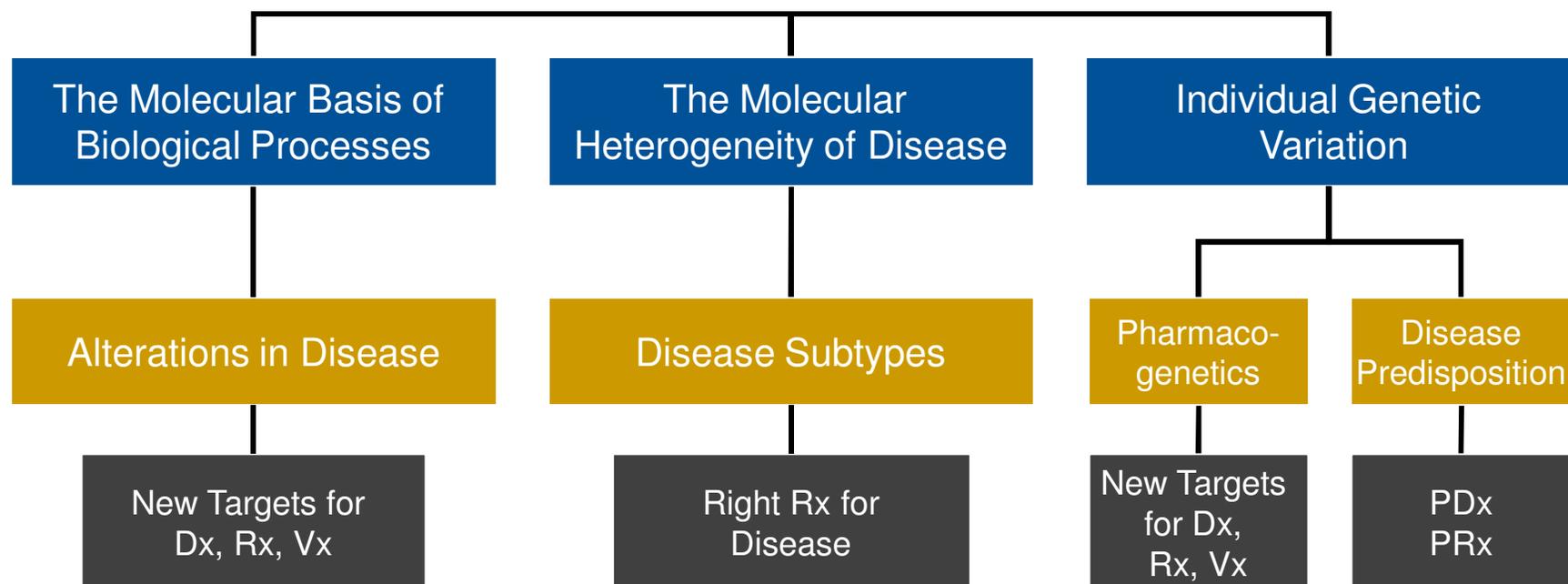
*A systems biology study of the Parsis to determine the genetic basis of
Longevity and age related disease.*

The AVESTAGENOME Project™



Strategy | R&D

*Analyzing the Molecular Profiles (Biosignatures)
of Body Functions in Health and Disease*



Old Money	New Money
From West to East	From East to West
Short term returns (limited exposure in start-ups)	Long/Mid term returns (investment from concept stage)
Limited Understanding from Investors (Risk Averse)	Highly Specialized Investors (Risk Taker)
Limited PE interest	PE investments in biotech in 2007 : USD 4.4 bn
Unavailable local capital	Global Arbitrage
Guarantees (tangible assets)	Guarantees (intangible assets)
Drug Development Cost in 1988 : USD 250 mn	Drug Development in 2008 : USD 1.2 bn
Classic pharma/diagnostics	Biotech / Integrated models
Pharma vs Biotech	Pharma = Biotech
US centric biotech industry	Global industry
Fully integrated business model (FIPCO)	Virtually Integrated business model (VIPCO)
Public OR Private	Public + Private
Large markets / Blockbusters	Niche / Orphan / PPP

Entering a Period of Cooperation



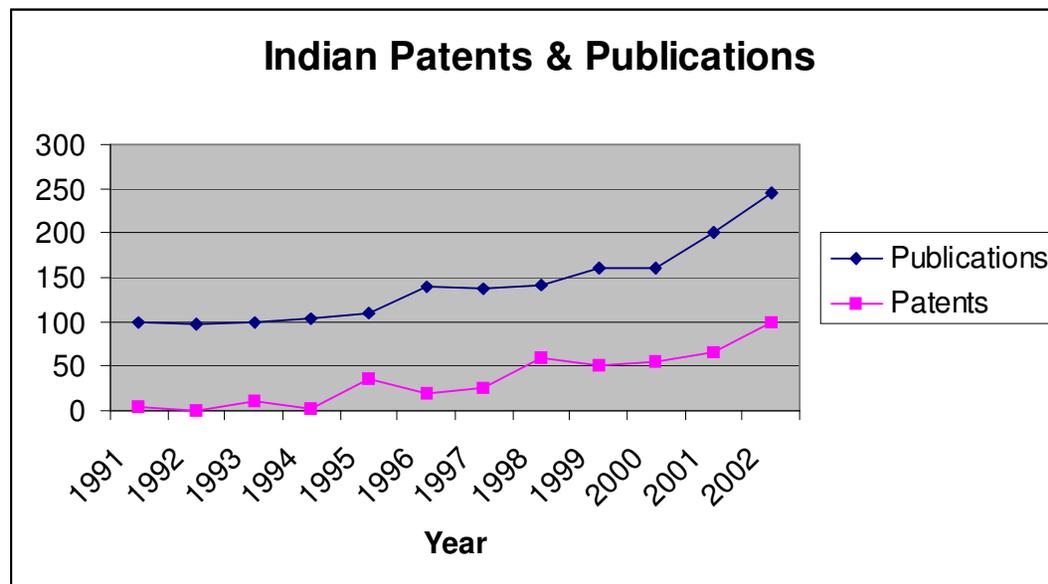
- Strategic Partnering
 - Co-development
 - Co-branding
 - Co-promotion
 - Co-marketing
- Country to country
- Big/small
- Within industry/outside industry (IT/biotech)



India – Innovation is Increasing

State of Innovation:

- Innovation historically has been in process improvement
- However, there are a growing number of patents and publications from government and academic labs



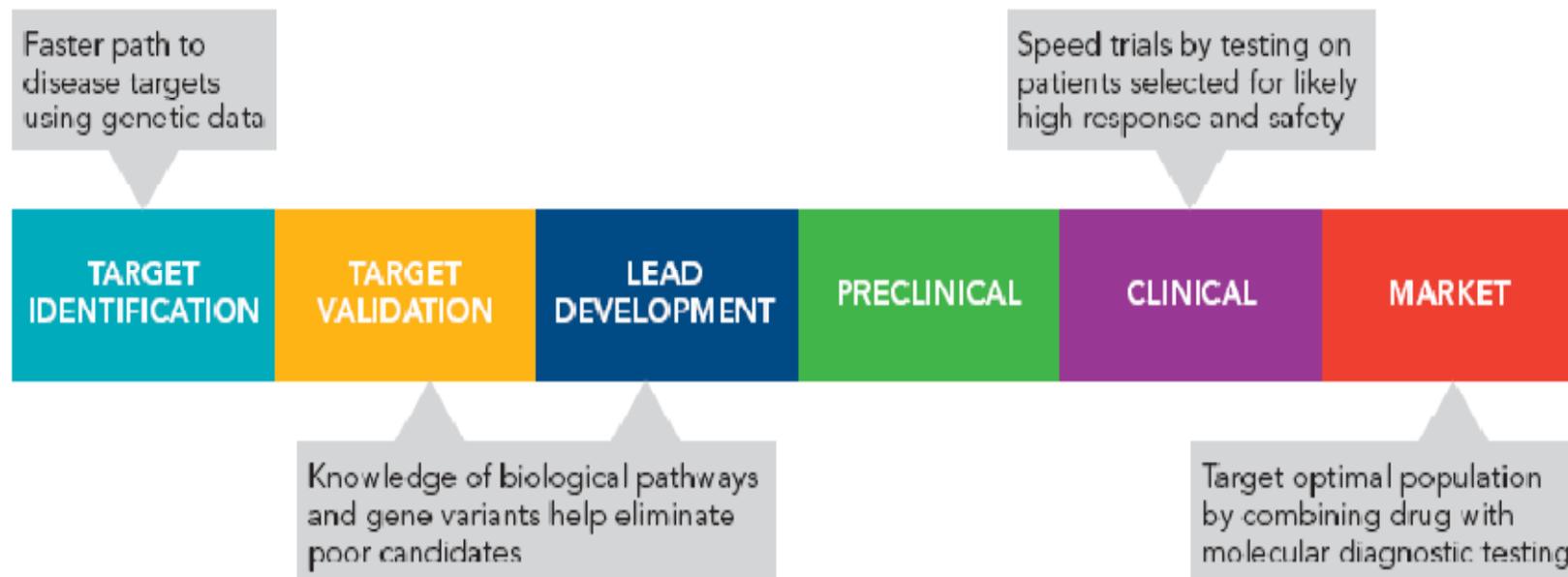
-Nature Magazine

The Avestagenome™ Project



Outcomes | Safer, More Effective Drugs

Identify disease targets, speed clinical trials, and advance more drugs that are safe and effective for specific populations.



Source: Personalized Medicine Coalition

The image features a central graphic composed of numerous thin, light gray concentric circles that create a sense of depth and movement. Overlaid on this are several thin, light green lines that intersect and curve across the composition. In the upper left and lower right corners, there are a few small, simple circles of varying sizes. The overall aesthetic is clean, modern, and minimalist.

THANK YOU