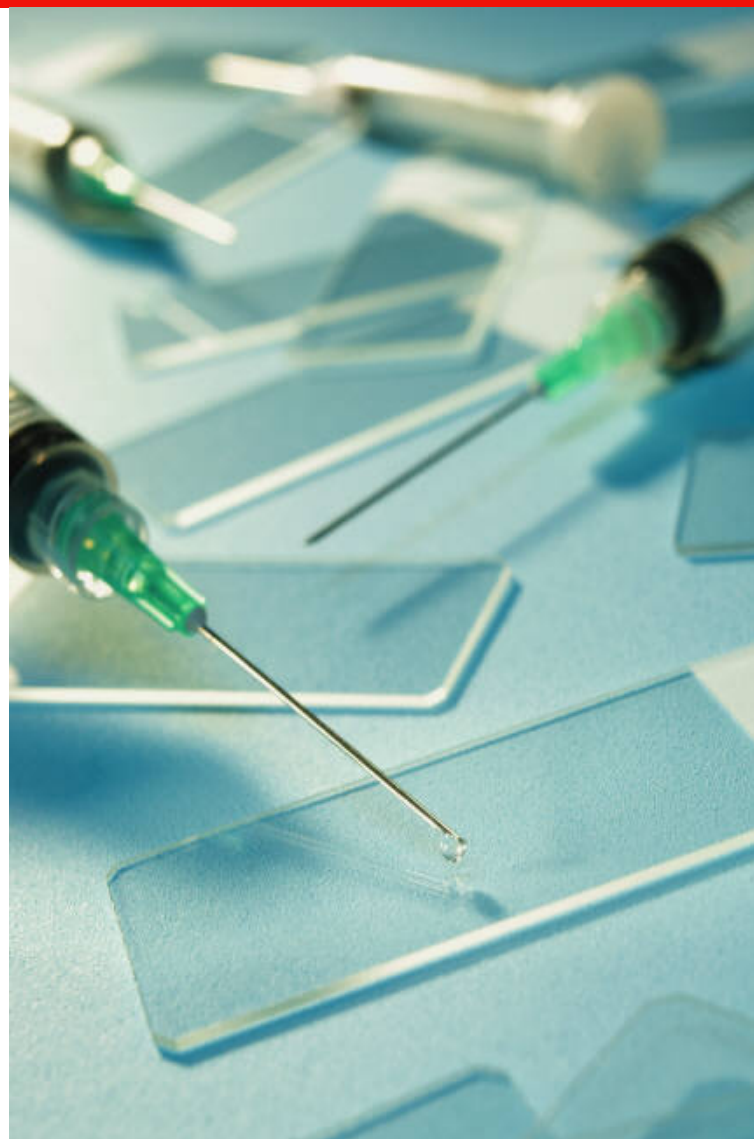
Nomura Code Securities Limited

Biotechnology

Frances Cloud, Nomura Code Securities

Istanbul, 8th November 2007



Industry background – Europe and the US

Evolution of Biotechnology

Biotechnology Milestones

BC – Use of biotechnology to brew beer, leaven bread, produce cheese and ferment wine

1928 – Discovery of Penicillin

1953 – Discovery of the DNA double helix model

1957 – First successful recombinant DNA experiment

1973 – Industrial glutamate production by fermentation

1982

- Recombinant human insulin is approved as the first biotech drug
- Development of a recombinant DNA vaccine for livestock

1986

- Production of first biotech anti-cancer drug – Interferon
- Genetically engineered plants (tobacco) are grown in field trials

1994 – First cloning of an animal from adult cells (sheep Dolly)

1997 – Approval for a whole food produced through biotechnology – Flavsavr Tomato

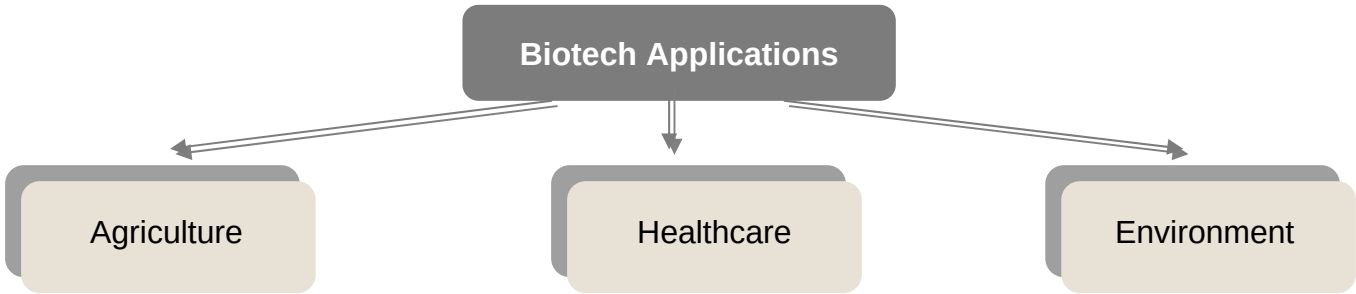
1999 – Production of human stem cells in cell culture

2004 – FDA approves the first DNA microarray for diagnostic purposes (AmpliChip)

2006 – Nobel Prize for the discovery of RNA interference

Source: TSC Research

Healthcare is an important application for biotechnology

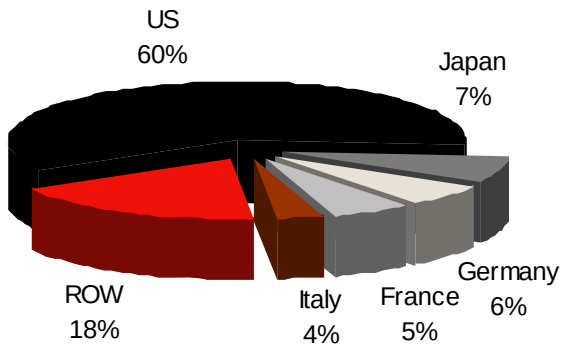


- *Genetically Modified Crops*
- *Genetically Modified Crops for Non-Food Uses*
- *Use of molecular-marker technologies*

- *Biopharmaceuticals*
- *Recombinant Vaccines*
- *In Vitro Diagnostics*

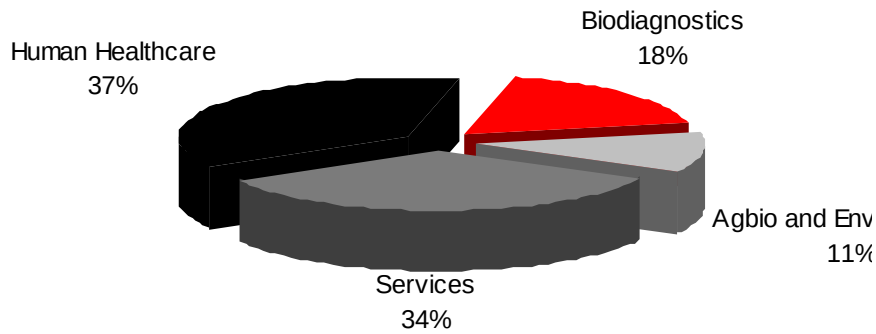
- *Biocatalysis*
- *Bioethanol*
- *Biopolymers/ Bioplastics*

Biotech by Country (2005)



Biotech by Segment (2006)

Biotech companies by sector in Europe

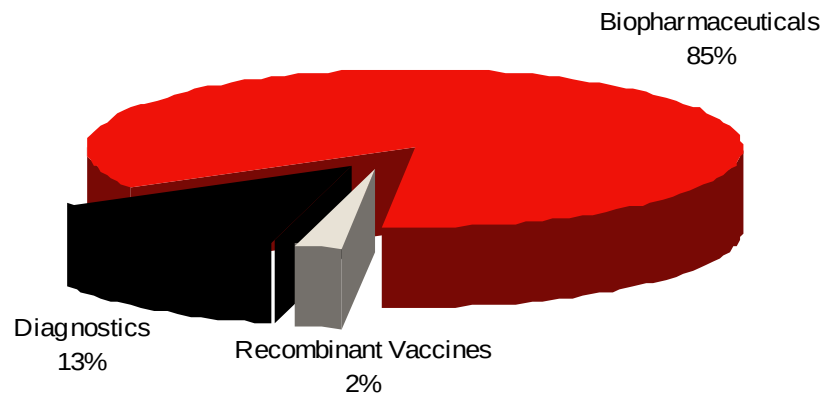


Source: TSC Research; EuropaBio (2006), "Industry in Numbers" – World Pharmaceutical Frontiers

Within healthcare, biopharmaceuticals predominate

Healthcare Biotechnology Segments

(100% = €13.3 billion, EU, 2005)



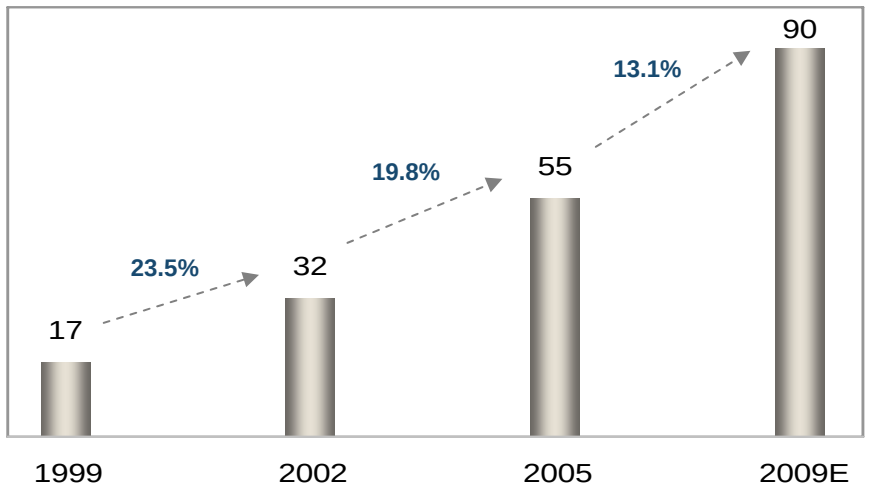
Biopharmaceuticals is the largest segment in the healthcare biotechnology industry comprising about 85% of the market

The average turnover per marketed biopharmaceutical is steadily increasing; in the EU it has tripled over the last 10 years, reaching € 133 million in 2005

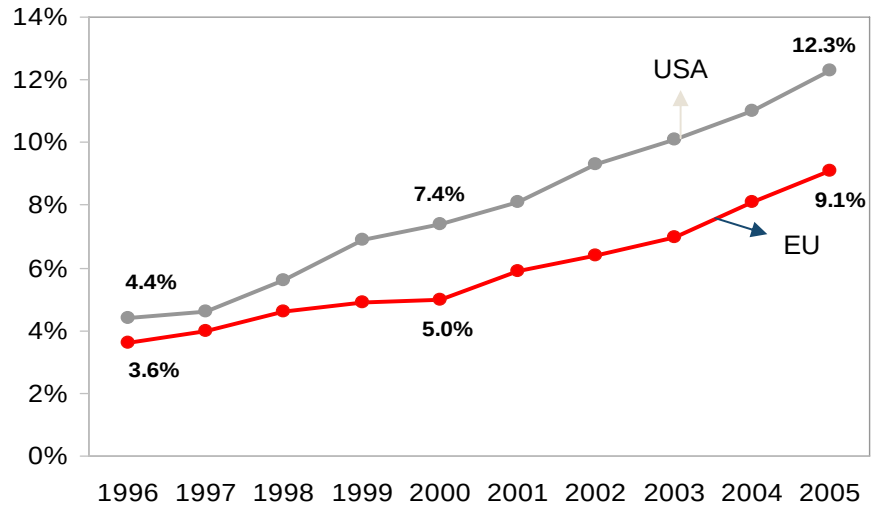
Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

Sales of biopharmaceuticals have grown faster than sales of small-molecule drugs in the past decade

Biopharmaceuticals Market Size ($ Bn)



Share of Biopharmaceuticals in Total Pharmaceuticals (%)



Biopharmaceutical products' share in global pharmaceuticals is expected to reach 13.8% by 2009

Source: IMS Health; BioGenerIX Projection; Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

US leads the way in the market for biopharmaceuticals; seven out of top ten products are US manufactured

Biopharmaceuticals

Classes of marketed biopharmaceutical products include recombinant hormones such as human insulin, monoclonal antibodies used to treat cancer and also for diagnostic purposes, and recombinant interferons and interleukins

Major therapeutic fields for which biopharmaceuticals have been developed are cancer, metabolic disorders and musculoskeletal and immunologic disorders

Breakthrough technologies – advancements in genomics, proteomics and completion of human genome project

Country	Biopharmaceutical	Manufacturer	Market Share (2005)	Change over 2004 (%)
US	Erypo/ Procrit	Johnson & Johnson	7%	(8.8)
US	Enbrel	Amgen/ Wyeth	7%	40.7
US	Aranesep	Amgen	7%	38.0
US	Remicade	Johnson & Johnson/ Schering Plough	5.7%	17.3
US	Epogen	Amgen	5.4%	(0.8)
Switzerland	Mabthera/ Rituxan	Roche/ Genentech	5.1%	23.6
US	Neulasta	Amgen	4.7%	31.7
US	Avonex	Biogen Idec	2.9%	9.6
France	Lantus	Sanofi-Aventis	2.9%	47.5
Switzerland	Herceptin	Roche/ Genentech	2.7%	48.2
	Total Top Ten		**50.4%**	**19.4**

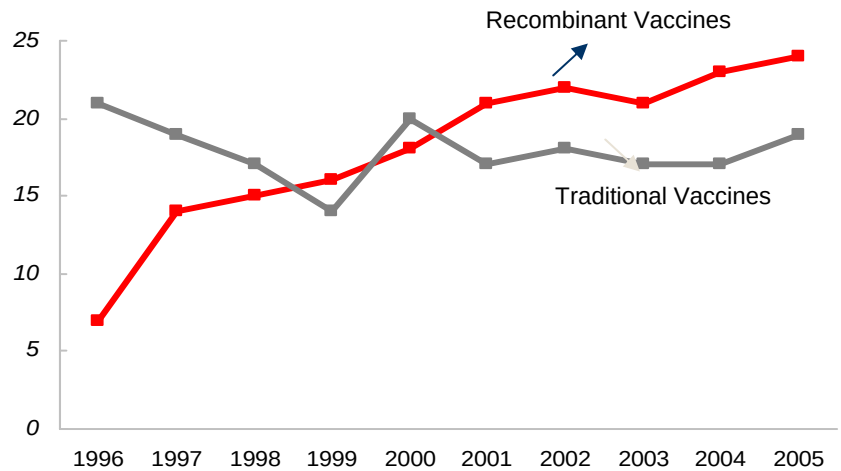
Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

Recombinant vaccines command much higher prices than traditional vaccines

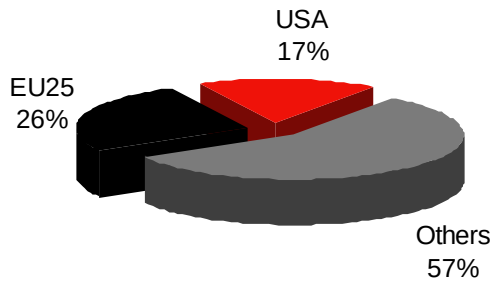
Recombinant Vaccines

- Vaccines represent about 1% of the total global pharmaceutical market; recombinant vaccines account for 20% of all vaccines, with most products targeting hepatitis B
- Recombinant vaccines sell at a premium price compared to conventional vaccines
- While the value sales of recombinant vaccines has quadrupled in the EU during 1996-2005, now accounting for 46% of the vaccine market, its share of total vaccines in recent years has been declining
- In the US, recombinant vaccines account for 54% of all vaccines

Average Turnover per Vaccine in the EU
(€ million)



Value Share of Recombinant Vaccine Production



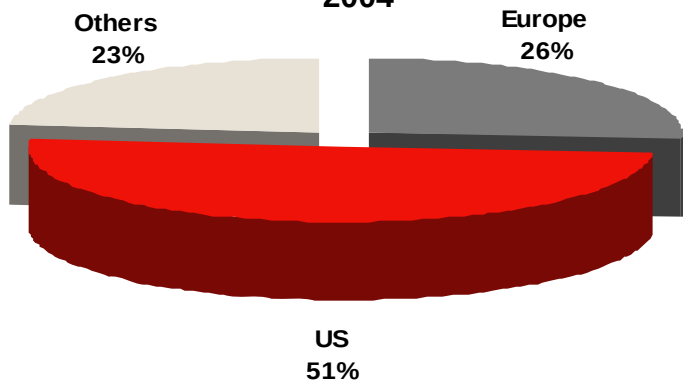
Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

Despite their potential for early disease detection, high costs may inhibit adoption of biotech diagnostics

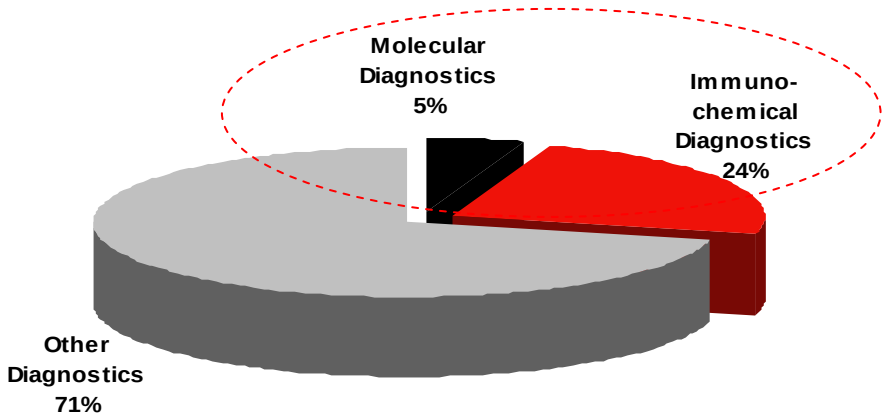
In Vitro Diagnostics

- Modern biotechnology diagnostics are a subgroup of in vitro diagnostic tests which are either protein-based or DNA-based
- Share of biotechnology diagnostics is high at 51% in the US, about twice the spend as compared to the EU
- As healthcare expenditures continue to rise, the use of sophisticated biotech diagnostics may be restricted due to high costs despite their potential for early diagnosis and prevention
- Some of the main application areas of biotech diagnostics
  - HIV tests
  - Cardiac diagnostic assays
  - Genetic testing

Share of Biotechnology Diagnostics By Country, 2004



Share of Biotechnology Diagnostics in Global IVD Diagnostics, 2004



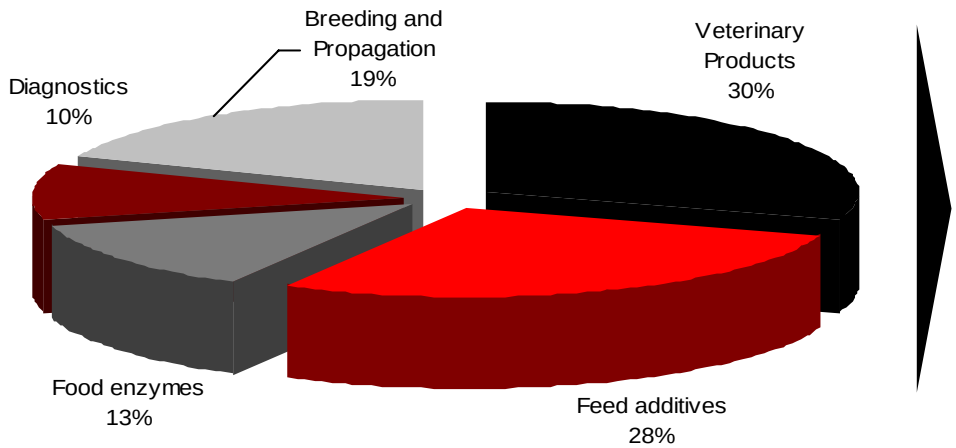
Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

Veterinary products and feed additives have the highest share of biotech applications in agriculture

Biotechnology Applications – Primary Production and Agriculture

- Breeding and propagation of crops, livestock and fish using genetic markers, genetic modification of seeds and embryo transfer
- Feed additive production
- Veterinary diagnostics – Detection of salmonella, genetic modification
- Veterinary Vaccines – for pseudorabies eradication
- Food enzymes

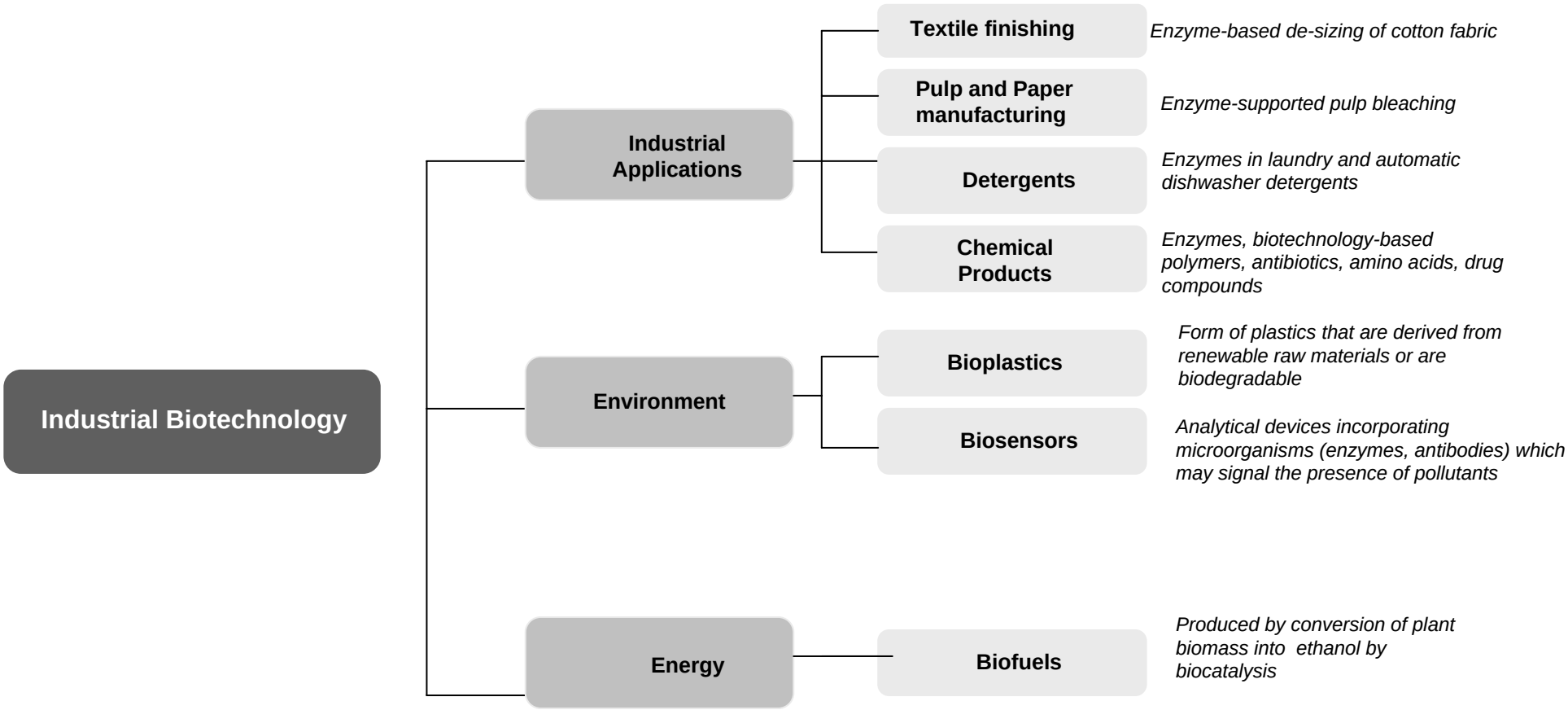
Turnover Share By Applications in Various Sectors (2005)



- *The combined economic contribution of the application of modern biotechnology in the input sectors has been estimated at between €3 - 5.6 billion or 13-23% of turnover in these sectors*
- *Main biotechnology tools applied include molecular marker technologies, genetic modification of plants and animals, embryo transfer and propagation techniques*

Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

Industrial biotechnology applications encompass applications in industry, environment and energy



Source: Consequences, Opportunities and Challenges of Modern Biotechnology in Europe – Joint Research Centre, European Commission (2007)

US leads the way in nanomedicines and PGx; Europe suffers from funding restrictions

	Nanomedicines
US	• As part of its five-year Alliance for Nanotechnology in Cancer, the US National Institutes of Health's National Cancer Institute (NCI) has granted $26.3 million in first-year awards to establish seven Centers of Cancer Nanotechnology Excellence (CCNEs) (2005) • As part of a New Pathways to Discovery project, the US National Institutes of Health (NIH) has granted $42 million over five years to establish four Nanomedicine Development Centers • The US demand for nanotechnology medical products is set to rise by over 17% annually to $53 billion in 2011 and $110 billion in 2016
Europe	• In the field of novel therapeutics and drug delivery systems, Europe has pioneered the design and development of many of the first generation nanomedicine with particular strength in the areas of tissue engineering, regenerative medicine and stem cell research • However, EU lags behind as funding mechanisms are fragmented and unorganised; this can inhibit attainment of critical mass and multidisciplinary needs for research and development
	Pharmacogenomcs
US	• Pharmacogenomics (PGx) is a growing area of interest both in Europe and in the US; more than 60% of the firms are located in US and the remaining 40% of the firms are in Europe • On an average the US research groups have on average twice the financial resources available to European groups; in the US the USA, the FDA has been very pro-active on PGx, enlisting expert staff and issuing guidelines for PGx-related drug licensing
Europe	• The EU is well-placed in PGx research, though lagging slightly behind the US in industrial activity • Heavy administrative burden, unclear requirements and the lack of a clearly earmarked funding programme for PGx has been impeding the development of PGx in Europe; academic research in the EU could benefit from greater unification of efforts and funding of more infrastructure

Source: State-of-the-art and potential socio-economic impact in the EU– Joint Research Centre, European Commission (2005)

EU leads stem cell research efforts; the US has vetoed increase in funding citing moral grounds

	Stem Cell Research
US	• The US federal spending through National Institutes of Health (NIH) has been about $640 million annually for the last couple of years (2006-07); only about 6% of that, or $40 million is used for human embryonic stem cell research • Stem cell research funding in the US has primarily been state and private inventor driven; recently the US administration vetoed the expansion of funding for embryonic stem cell research • State stem cell research spending has been around the $528 million mark annually; California's $3 billion is by far the biggest commitment to stem cell research; until 2007, private donors had contributed $1.74 billion for stem cell research in the US
Europe	• Seventh EU Research Framework Programme 2007–2013 would allocate just under €10 billion a year, double current annual funding levels, for research • The European Union has agreed to allow funding for human embryonic stem cell experiments after member states compromised
	RNAi Technologies
US	• Understanding the mechanism of RNA interference has suggested ways to create superior new therapies against disorders such as macular degeneration and respiratory syncytial virus (a common childhood infection) • Start-up biotechnology firms and major pharmaceutical companies have invested billions of dollars into RNAi research projects; the first drug candidates already are entering early human clinical trials and the federal government has just awarded a $23 million contract to a private company to develop RNAi-based drugs as a defense against bioterrorism

Source: American Society for Biotechnology (2007)

Biotechnology drivers in developing markets

NOMURA

CODE

Biotech Drivers in Emerging Countries

	Regulations	Funding	Skills
 **Chile**	+ Unveiled its first biotech policy in 2003, providing an institutional framework for public and private biotech initiatives + Made amendments to Investment Fund Act to relax restriction on VC financing an create an Emerging Stock Exchange, which provides investors with exit options	+ Government agencies to provide funding for biotech + Mining and fisheries corporations are investing in biotech due to government incentives + Recently introduced Second Capital Market Reform which provides tax incentives for VC companies	+ Trained researchers and technicians with reasonable salary expectations
 **South Africa**	+ Sound legal system and strong ICT infrastructure	+ Government funds biotech through various agencies + Only one privately managed VC	+ World class researchers and research institutions
 **Cuba**	+ Strategic government focus on biotech for decades	+ Exclusively state funded	+ Highly skilled young workforce + Integrated innovation system; strong linkages among diverse groups facilitates knowledge flow

Source: "Off The Beaten Path" – Nature Publishing Group (March 2006)

Biotech Drivers in Emerging Countries

	Regulations	*Funding*	*Skills*
 **China**	+ Concerted government support in the form of incentives and investment + Liberal regulations in "hot" areas such genetically modified organisms, gene therapy, cell therapy and stem cell research	+ State and local governments fund biotech initiatives, including government sponsored VC funds – Not much international funding yet	+ Skilled, low-cost trained workforce + R&D infrastructure + Research institutions with 20 years track record of investments
 **India**	+ Government funding agencies offer research grants, fellowships, soft loans and equity + Launch of Small Business Innovation Research Initiative to promote growth of biotech industry through public-private partnerships	+ Some indigenous VC firms are becoming an important source of funding for start-ups – Not much international funding yet	+ Well trained, highly skilled workforce – key destination for outsourcing of contract manufacturing, clinical trials and contract research + Local medicinal knowledge
 **South Korea**	+ Government support through grants and credit guarantees + Regulatory environment encourages innovative products	+ Number of VCs invest in biotech much more than in other emerging economies	+ Strong science base in universities and colleges + Highly skilled scientific workforce

Source: "Off The Beaten Path" – Nature Publishing Group (March 2006)

Lack of tangible government incentives and funding issues limit Turkey's biotech story

Turkey – Regulations, Funding and Skills

Regulations	*Funding*	*Skills*
– Hardly any regulations in the field of biotechnology; does not have a well-regulated biosafety policy or intellectual property rights law – Although biotechnology has been a priority area in Turkey since 1983, there are no incentive programmers and government funding for biotechnology research/ commercialisation is very limited	+ Government intends to increase R&D expenditure from 0.64% now to 2% of GDP by 2010; additional €275 million allocated to promote science and technology (not specific to biotech) – Only €43.8 million was spent on biotechnology in 2002-05 – No private funding into biotech	– Relative lack of skilled personnel compared to some other developing markets – Knowledge base mainly academic – industry is still embryonic – Number of biotechnology patents per million capita is very low

Biosimilars in Turkey

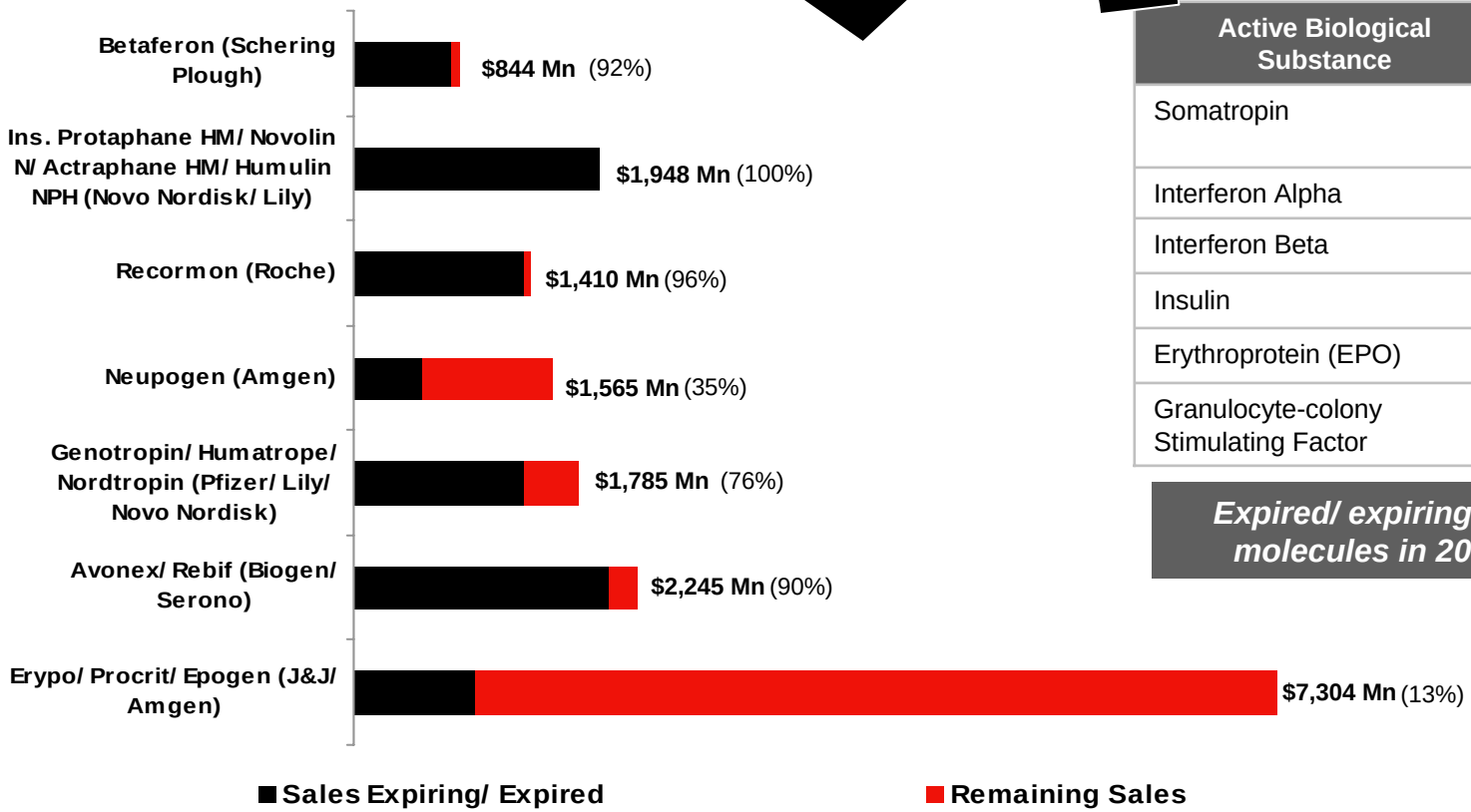
+ Health (58%) and generic (18%) biotechnology publications account for the largest share of all biotech publications
+ There was a strong growth in generic biotechnology publications in absolute terms although share of total biotech publications declined
+ The health and agri biotech sectors are expected to show significant growth from 2010 onwards (consistent with the government's intent to increase R&D expenditure by 2010)

Source: TSC Research

Biosimilars

Biosimilars offer a ~$9 bn opportunity in the short-term with the first biopharmaceuticals coming off patent

First generation biopharmaceuticals coming off patents in 2005-09
***Total 2004 Sales** (% sales expiring/ expired)*



First Wave of Biopharmaceuticals
(coming off patents in the next few years)

Active Biological Substance	Treatment Area
Somatropin	Human Growth Hormone Replacement
Interferon Alpha	Hepatitis C
Interferon Beta	Multiple Sclerosis
Insulin	Diabetes
Erythroprotein (EPO)	Anaemia
Granulocyte-colony Stimulating Factor	Neutropenia

Expired/ expiring sales from major biotech molecules in 2005-09: $9 Bn (2004 sales)

Source: "Industry in Numbers" – World Pharmaceutical Frontiers

The second wave may rapidly reduce the demand for first wave originals or similars

Biosimilars drivers are the same as for generics

- High cost of drugs, particularly true for biotech drugs – they can cost upto 30 times more than a conventional small molecule drug
- Focus on reduction of government healthcare spending (reaching $3 bn for erythropoitein products from Amgen and J&J in 2007)
- Originals coming off patents
- Industry capability of making biosimilars
- EU has regulations in place for approval and commercialisation of biosimilars; US is approving biosimilars on the case-to-case basis

This is where the similarity ends…

- Second generation' branded biopharmaceuticals will ***reduce the demand for first generation branded/ generic products***
- Biosimilar development and commericalisation involves much more complexity and cost since exact generic copies are impossible
  - EU regulations mandate full preclinical trials and limited clinical trials
  - Concerns about side effects is leading to tighter safety controls
- Higher development costs (due to clinical trials), elapsed time and complexity result in higher barriers to entry for biogenerics; companies would need much stronger capabilities, close to those required for biotech originals development
- Uncertain approval and patent procedures

A biosimilar costs anywhere between $10-40 Mn to develop, compared to $5-10 Mn for a small molecule generic, with development timeline comparable to new biopharmaceuticals

Source: "Biogenerics: the battle is only just beginning" – Pharmaceutical Business Review (January 2006)

Due to molecular complexity it is both more difficult to create biosimilars as well as get approvals

Johnson & Johnson

- In 1998, J&J took over production of the EPO (erythropoietin) that it sold in international markets under license from Amgen
- Dialysis patients receiving J&J's reformulation had a higher incidence of a rare, but strong immune reaction that shuts down red-blood-cell production and leaves a patient with a life-long dependency on transfusions
- After a four-year investigation involving more than 100 people, J&J concluded that the problem arose from the interaction of the packaging rubber stopper with a new stabilising ingredient introduced in 1998

Biotech industry groups have consistently argued that follow-on biologics should have to undergo the same testing required of the pioneer product. The argument is supported by case studies illustrating the hazards of copying biopharmaceutical drugs

Delivering biosimilar medicines involves complex technical and regulatory challenges

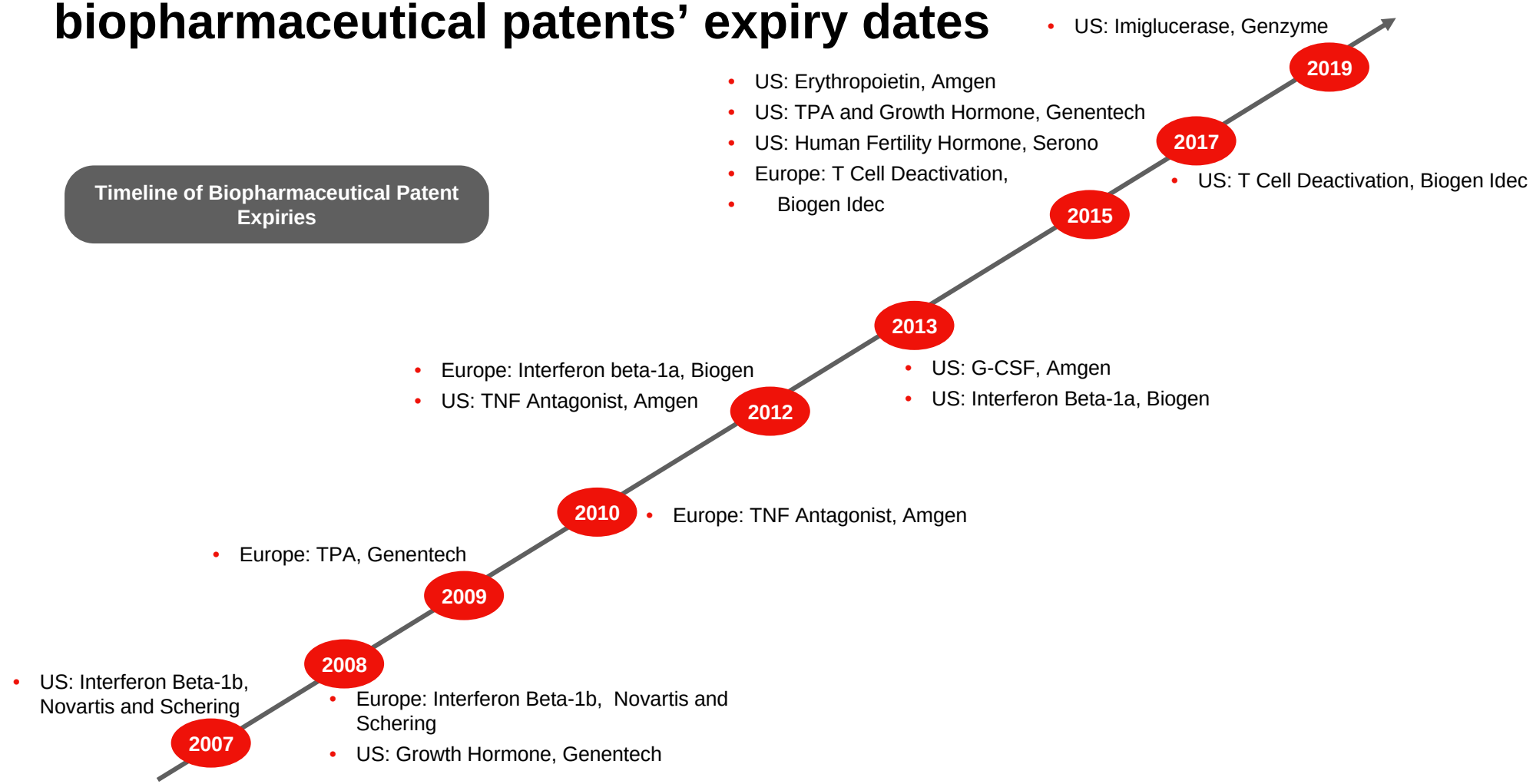
Sandoz

- In July 2003, the Sandoz unit of Swiss giant Novartis sought approval of a genetically engineered growth hormone called Omnitrope
- The application invoked a pre-1997 FDA rule that let a follow-on drug applicant piggyback on another manufacturer's clinical studies, instead of repeating those studies with the follow-on drug; Sandoz stated that Omnitrope was just like Pfizer's Genotropin, an approved growth-hormone product
- Pfizer, Genentech and a biotech trade group petitioned the FDA, demanding that follow-on biologics repeat all tests in order to win approval
- In 2004, the FDA finished reviewing the Omnitrope application but the agency said that it would defer its decision, because of the application's complexity
- Sandoz sued the FDA in the US District Court for delays; in 2006 it received a positive ruling that ordered the FDA to make a decision on approval

Source: “Biotech's Next Challenge” – Barron’s Online (May 2006); TSC Research

Europe and the US have significant differences between biopharmaceutical patents' expiry dates

Timeline of Biopharmaceutical Patent Expiries



Source: "Biotech's Next Challenge" – Barron's Online (May 2006); TSC Research

Europe is ahead of the US in establishing frameworks for approval of biosimilars

2007

First biogeneric drug, Omnitrope (recombinant growth hormone) approved in the EU, Australia and the US (the latter despite the lack of specific regulations governing the approval of biogenerics)

2009

First biosimilar approval expected in the US. Currently, branded opposition is slowing down necessary regulatory reforms

2011

Sales of six key biosimilar product categories are expected to reach $2.2 billion by 2010 in the US and five major EU markets

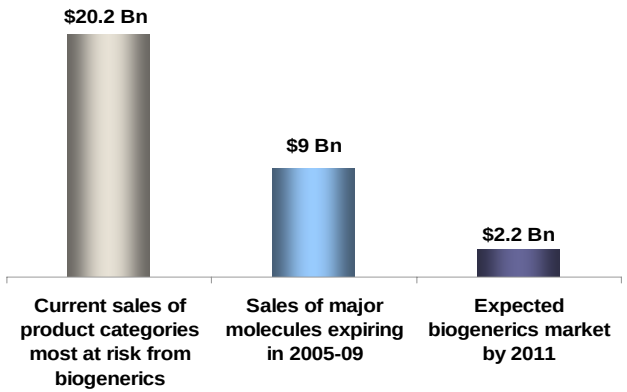
Why Europe is ahead in the biosimilars game…

The EU has created a legal and regulatory framework for the approval and commercialisation of biosimilars

Adopted EMEA's (European Medicines Agency) guidelines on similar biological medicinal products (came into effect June 2006)

Why the US is lagging…

US Congress has yet to create legislation for 'follow-on protein products'. The FDA approved Omnitrope (Sandoz GmbH), a GH biosimilar, but this was done through the 505(b)(2) route, which essentially defined it as a drug rather than a biopharmaceutical. Further approvals are likely to be on a case-to-case basis



The categories most at risk are first generation biogenerics - human growth factor, epoetin, colony stimulating factors (CSFs), interferon alpha and interferon beta; insulin will be minimally impacted

Source: "Biogenerics: the battle is only just beginning" – Pharmaceutical Business Review (January 2006); European Commission (2007)

Biosimilars were expected to be less competitive and more profitable than generics – this may not be true

Entry Barriers to Biosimilars Market

- Approval process in Europe (which is expected to lead the way for biosimilars) is not easy
- Companies have had to run at least two clinical trials comparing a biosimilar EPO to a reference product like Eprex
- Stringent approval process has already dampened the ambitions of some generic makers such as Croatia's Pliva - it shelved plans for a biosimilar EPO, while continuing work on a biosimilar G-CSF in partnership with Australian cancer- drug specialist Mayne Pharma
- Even if companies get approval, substitutability is decided by individual member states, not by the EU
- The high cost of getting products to market has not prevented fierce price competition, at least in part because the early biosimilars also have numerous originators. The situation may be better in future products, such as antibodies

"You won't be able to produce these products in a garage in Lithuania"
- Huub Schellenkens, Utrecht University, Netherlands (2006)

"If the pricing and profits of biogenerics hold up, giants like Pfizer could vie with Novartis in the biogeneric market"
- Eric Schmidt, analyst, SG Cowen

Source: "Biotech's Next Challenge" – Barron's Online (May 2006)

Leading biotech companies have earmarked large R&D budgets for developing biosimilars

SANDOZ
Think Generics

- Sandoz has invested approximately $150 million in development and manufacturing facilities for biosimilars over the past few years
- Won a landmark first-of its-kind biosimilar drug approval in the US after a long battle with the US Food and Drug Administration (FDA) for its biologic growth hormone drug, Omnitrope. Also got the first European approval of EPO, which it will sell as Binocrit.
- Binocrit will cost up to 30% less than the original J&J drug, depending on the country where it is marketed
- Sandoz is also developing copies of five other biopharmaceuticals and these are currently at different stages of development
- Momenta, which specialises in characterising and engineering complex drugs, is developing four biosimilars for Sandoz in a deal which includes taking over two of Sandoz's late-stage compounds

biopartners

- BioPartners got a biosimilar (growth-hormone product) approved in Europe in 2006
- In March 2007, the company was sold to the Polish biotech company Bioton, owner of SciGen (biopharmaceuticals) for $78 million
- The partners in BioPartners are Rentschler (German Contract Drug Developer), with whom it is developing an interferon-beta and LG Life Sciences, with whom it developed Valtropin, an hGH that was the first to receive European approval
- A sustained-release version of Valtropin is also in development, currently in phase III trials scheduled to complete in 2008

Source: APM Health Europe; Espicom; Company Websites

Some of these biosimilars are already being marketing in emerging countries

ratiopharm

- German drug development company, Ratiopharm, has earmarked up to $61.5 million to develop a new version of an already-marketed biologic drug using a pegylation technology developed by US firm Neose (2005)
- Ratiopharm, the largest German generic manufacturer, has two applications for approval of biosimilars at the EMEA, after the clinical phase III studies were successfully completed

- Teva is well-placed in terms of research after the acquisition of the US drug firm Sicor in 2003; Sicor had three facilities developing biosimilar products - in Mexico, China and Latvia - which are all now in the Teva stable

STADA Arzneimittel

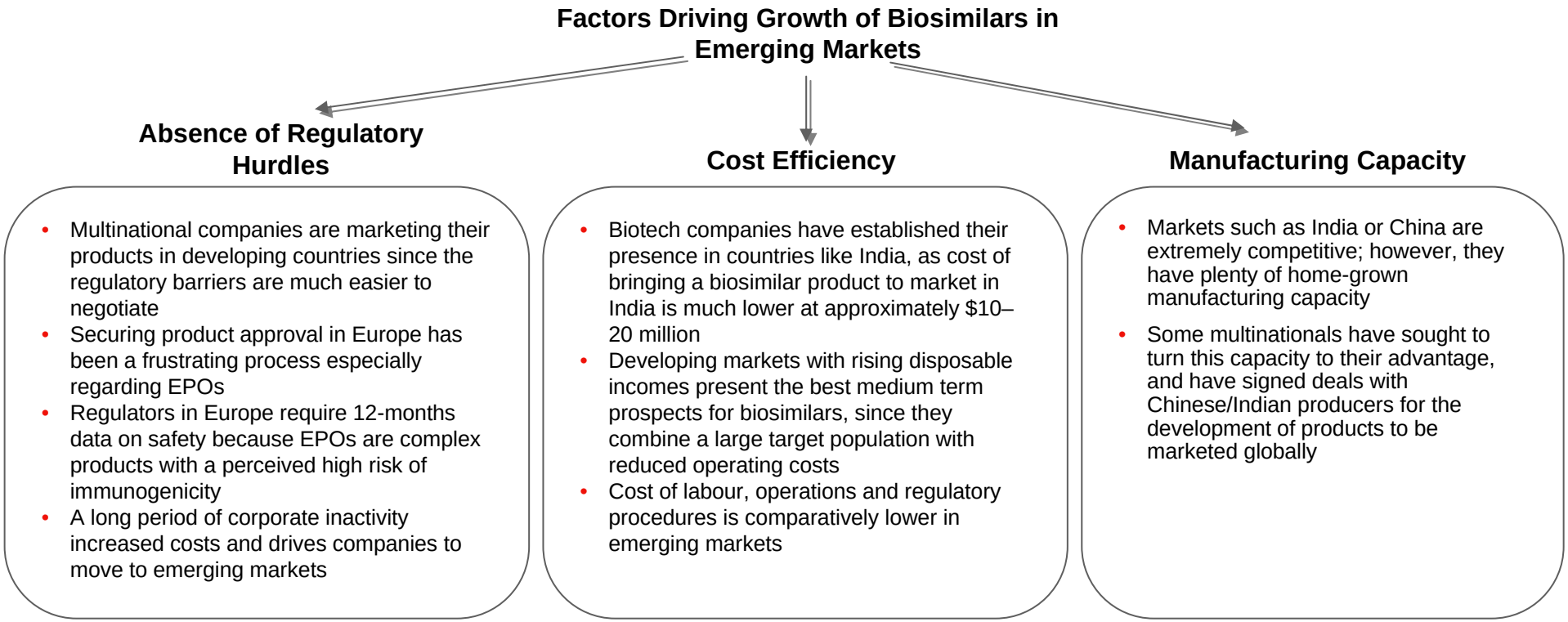
- Stada is working closely with Bioceuticals Arzneimittel AG to pursue various biosimilar projects predominantly financed by venture capital
- Stada paid €16.3 million to acquire a 14.9% stake in Bioceuticals, a company set up predominantly with venture capital and in which it has the option for a complete take-over in 2011
- Of Bioceuticals' development products, the most advanced is an EPO - erythropoietin-zeta - which was filed with EMEA in June 2006 and has just received a positive opinion from the CMPH
- The next most advanced project is a Filgrastim biosimilar to Amgen's Neupogen (recombinant methionyl human granulocyte colony-stimulating factor) for which preclinical trials have now been completed after a delay; Stada has worldwide distribution rights for its Filgrastim product

Source: APM Health Europe; Espicom; Company Websites

Regulatory ease and low cost of operations have enabled growth in emerging markets

Biosimilars is increasingly available in emerging regions such as Eastern Europe, China, India and South America

Companies such as Bioton, Teva and Dr Reddy's have all targeted countries with more relaxed regulatory requirements; Teva and others such as Dragon Pharmaceuticals are already selling their products widely outside the US and Western Europe



Source: APM Health Europe; Espicom Business Intelligence

Biosimilars will be dominated by big pharma from emerging nations as well

Biocon

- Fully integrated bio-pharma company with presence in therapeutic areas of oncology, nephrology, diabetes and autoimmune diseases; biopharmaceuticals segment is the largest contributor to the top-line (84.4% in 2007)
- Major focus area under biosimilars has been monoclonal antibodies (MAbs); key development programs in biosimilars are in G-CSF (oncology) and Streptokinase (cardiovascular)
- Biosimilar products - INSUGEN (Recombinant Human Insulin) launched in 2004, BIOMAb-EGFR (Humanised Monoclonal Antibody) launched in 2006 and ERYPRO (Erythropoietin)

Dr. Reddy's

- Vertically integrated global pharmaceutical company with presence across the value chain, producing finished dosage forms, active pharmaceutical ingredients and biological products
- Invested $30 million to build a bio-manufacturing facility in Hyderabad, expected to be complete by 2009
- Biosimilar products – Grafeel (G-CSF) launched in 2001 and Reditux (monoclonal antibody); presently working on eight biosimilar products which are in different stages of development

Wockhardt

- One of the top three generic players in India, Wockhardt presently manufactures biogenerics for unregulated markets
- In biotechnology, the company provides gene cloning; development of production strains; expression of proteins in all major expression systems; purification; downstream processing and development; testing and marketing of formulations
- Wockhardt seeks to commercialize erythropoietin, insulin and alpha interferon in the regulated markets in Europe and the US, once regulatory procedure for approving biogenerics is formulated
- Developed six biotech products; two major biosimilar products are Wosulin (Recombinant insulin) and Wepox (Erythropoietin)

Source: TSC Research; Company Websites

* Note: G-CSF – Granulocyte Colony Stimulating factor

Shantha Biotech

- Pioneer in biotechnology, Shantha Biotech is the first Indian company to develop, manufacture and market a recombinant DNA product, Hep-B in India
- Shantha Biotech is a research driven company; major therapeutic focus area being infectious diseases and oncology; R&D activities focused around product segment such vaccines, therapeutic proteins and therapeutic monoclonals
- Developed three biosmilar products - interferon alpha, erythropoietin and streptokinase

Bharat Biotech

- Bharat Biotech is a biotechnology company specialising in product-oriented research, and development and manufacturing of vaccines and biotherapeutics
- Bharat Biotech International recently launched an anti-rabies vaccine, Rabirix, for both prophylactic and therapeutic treatments; invested $6.8 million for developing Rabirix
- Marketed biosmiliar product – Hepatitis B; products under development in the biosmilar area are Streptokinase, VEGF

Ranbaxy

- Ranbaxy Laboratories is among the top ten global generic companies, producing wide range of medicines covering majority of the chronic and acute therapeutic segments
- Ranbaxy's foray into the biosmilar drug market has been through a tie-up with Zenotech Laboratories (speciality generics injectables company in biotechnology area) for global development and marketing of G-CSF

Source: TSC Research; Company Websites

* Note: G-CSF – Granulocyte Colony Stimulating factor

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