December 13, 2005

Outline and Strategies of Toray Life Science Businesses

Toray Industries, Inc.

Executive Vice President & Representative Director
Hiroaki Kobayashi

Managing Director, General Manager of Pharmaceuticals and Medical Products Division
Kouzo Nagai

Director, General Manager of R&D Division
Koichi Abe

- Summary

  Executive Vice President & Representative Director

  Hiroaki Kobayashi

- Outline and Strategies of Pharmaceuticals and Medical Products Businesses

  Managing Director, General Manager of Pharmaceuticals and Medical Products Division

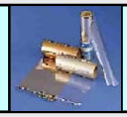
  Kouzo Nagai

- R&D Strategies of Life Science Businesses

  Director, General Manager of R&D Division

  Koichi Abe

Positioning of Life Science Businesses in Toray

<Business Segment>	<Major Products>	FY Mar/05 Net Sales	FY Mar/05 Operating Income
Fibers & Textiles		¥513.4 bill. (40%)	¥20.9 bill. (26%)
Plastics & Chemicals		¥300.4 bill. (23%)	¥15.7 bill. (19%)
IT-related Products		¥219.1 bill. (17%)	¥28.3 bill. (35%)
Carbon Fiber Composite Materials		¥44.7 bill. (3%)	¥5.6 bill. (7%)
Environment & Engineering		¥148.7 bill. (11%)	¥4.3 bill. (5%)
Life Science Other Businesses		¥72.3 bill. (6%)	¥6.5 bill. (8%)
		¥1,298.6 bill.	¥81.1 bill.
Life Science: Pharmaceuticals and Medical Products		¥44.4 bill. (3%)	¥2.9 bill. (4%)

Strategically Expanding Businesses

★ Strategically Expanding Businesses (Life Science, IT-related Products, Environment, Safety, and Amenity)
→ Candidates for next core businesses

TORAY

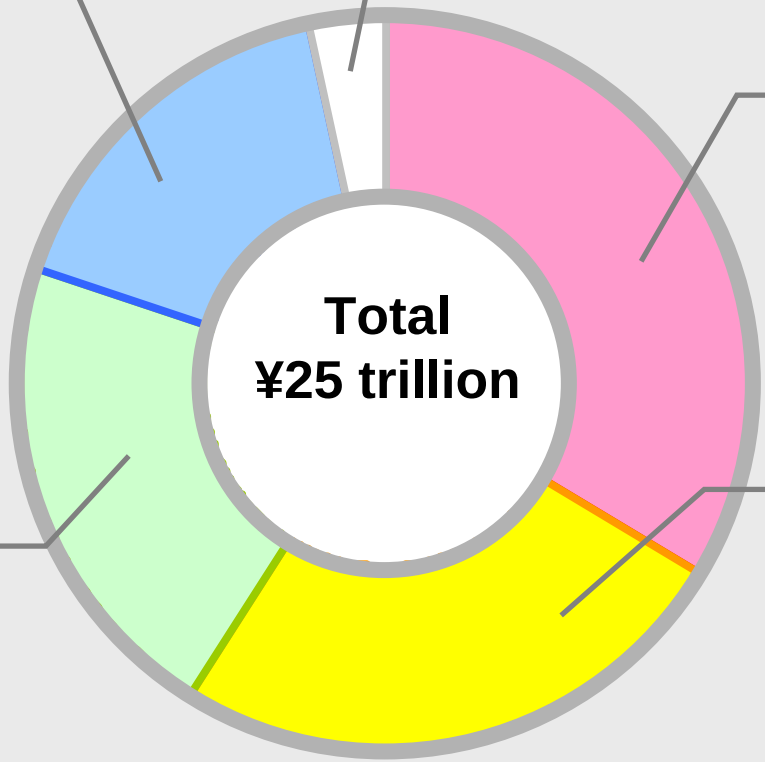
Market Scale Forecast of Bio-related Industries Expected in 2010

(from 2002 Cabinet Office BT Strategy Outline)

Bio-related industries in Japan : ¥1.3 trillion (2001) → **¥25 trillion (2010)**

World wide ¥230 trillion

Others ¥0.8 trillion



Environment / Energy ¥4.2 trillion

- **Bio-processing ¥3.6 trillion**
- Biomass ¥0.2 trillion
- Bioremediation ¥0.4 trillion

Medical ¥8.4 trillion

- **Pharmaceuticals / Medical products ¥8.4 trillion**

Bio-tools / Information ¥5.3 trillion

- **Bio-tools ¥3.1 trillion**
- Bioinformatics ¥2.2 trillion

Foods ¥6.3 trillion

- Health care foods ¥3.2 trillion
- Other food industries ¥3.1 trillion

Red Figures : Toray-related fields (Total ¥15.1 trillion)

TORAY

Organization of Toray Life Science Businesses

Toray Group Life Science Businesses

Pharmaceuticals

Toray, Toray Medical

Feron*

Dorner* / Procylin (BPS)

Medical Products

Toray, Toray Medical

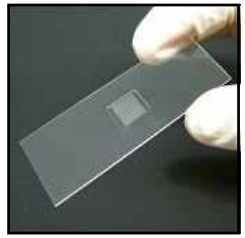
Toraysulfone*

Toraymyxin*

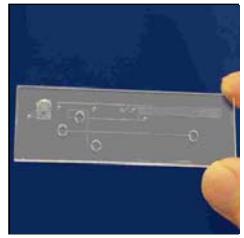
Inoue-Balloon Catheter

Bio-tools

Toray (From FY Mar/07)
Kamakura Techno-Science
Toray Research Center



High performance DNA chips



Lab. on chips

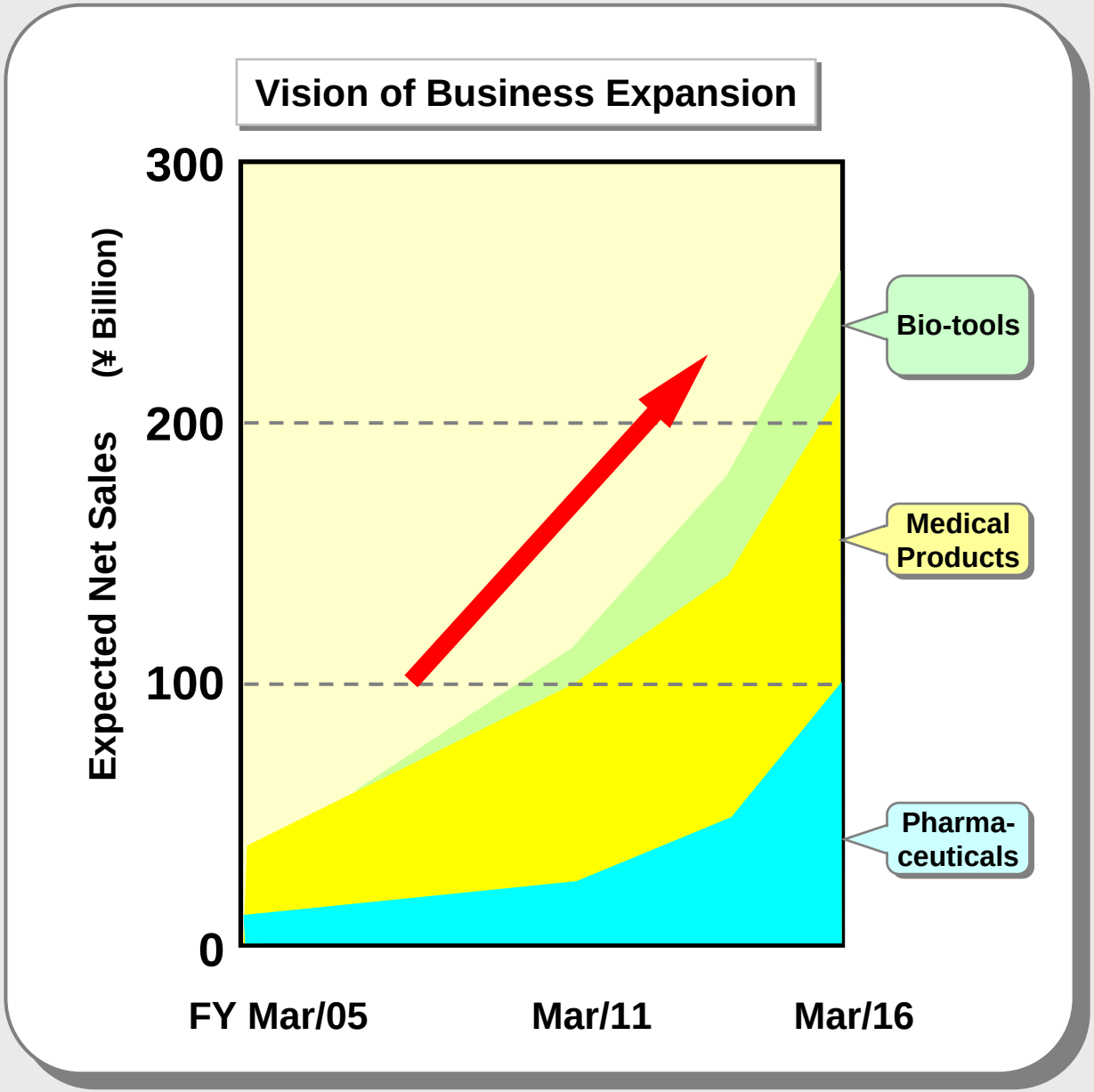
Blood preprocess devices

Life Science-Related Businesses

Animal drugs	: Intercat*, Interdog*
Water treatment systems	: Membrane Bio Reactor
Bio raw material polymers	: Polylactic acid
Bio process synthesis	: Pyruvic acid, D-tartaric acid

TORAY

Expansion of Life Science Businesses



Characteristics and Issues of Toray Life Science Businesses

Life Science Businesses

Pharmaceuticals

◆ **R&D for Drug Discovery**

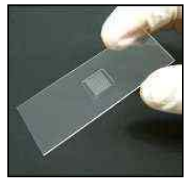
- New drugs for unmet medical needs
- New indications of Feron* and Dorner*

Medical Products

◆ **R&D based on Extracorporeal Circulation**

- Artificial kidney of the next generation under development
- Pipelines for novel medical devices

Bio-tools



◆ **Integration of Biotechnology & Nanotechnology**
⇒**Generation of Innovative Bio-tools**

- Research tools & diagnosis businesses (business model by alliance)
- Contents business (joint R&D with medical institutes)

★ **R&D Expenditures/Rate to Net Sales : over 20%**
(about 25% of total R&D Expenditures)

TORAY

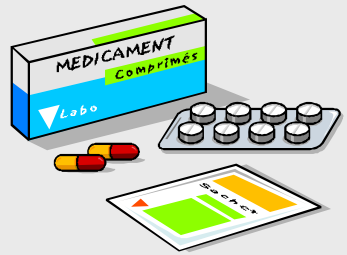
Pipeline of Pharmaceuticals & Medical Products

[Pipeline of Pharmaceuticals]

R&D Themes	R&D Stage
Antipruritic Agent (TRK-820) — Uremic Pruritis —	Phase III
Antipruritic Agent (TRK-820) — Itching of Atopic Dermatitis —	Phase I
Drug for Urinary Frequency (TRK-130)	Phase I
Analgesic for moderate to severe pains (TRK-091)	Phase II
Feron*(new indication) — Liver Cirrhosis —	Submitted
Feron*(new indication) — Combination Therapy with Ribavirin for Chronic Hepatitis C —	Phase III
Dorner*(slow released) — pulmonary hypertension —	Phase II/III
Dorner*(slow released) — chronic renal failure —	Phase II

[Pipeline of Medical products]

R&D Themes	R&D Stage
Toraylite*(Dried product)	Preparing for Sale
Anti-thrombogenic PMMA membrane	Development
Oxidized LDL removal membrane	Development
Leukocyte removal column	Development
Catheter for atrial fibrillation	Development



P I :Phase I Clinical Study
P II :Phase II Clinical Study
P III:Phase III Clinical Study

TORAY

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  Director, General Manager of R&D Division
  Koichi Abe

History of Toray Development of Pharmaceuticals and Medical Products

Year	Highlights
1947 - 1953	Production and sales of penicillin
1970	Start in-house research for pharmaceuticals and medical products
1977	Launched Filtryzer* (kidney dialysis)
1978	Launched PGF2a (injectable solution, labor induction)
1983	Launched PGE2 (oral stabilization agent, labor induction)
1985	Launched Interferon-β (Feron*)
1986	Launched Anthron* (antithrombogenic catheter)
1988	Launched Inoue-Balloon Catheter (mitral stenosis)
	Established Pharmaceuticals & Medical Products Division
1992	Launched PGI_2 derivative BPS (Dorner* / Procylin)
	New indication of Feron* to active hepatitis C
1993	Launched Toraymyxin* (blood purification device for treating severe septicemia)
1994	Launched Toraysulfone* (kidney dialysis)
1997	New indication of Feron* to inactive hepatitis C
1999	New indication of Dorner* / Procylin to pulmonary hypertension
2002	Filed MAA for TRK-820 (antipruritic drug) in Sweden

Green-letter : Pharmaceuticals
Blue-letter : Medical Products

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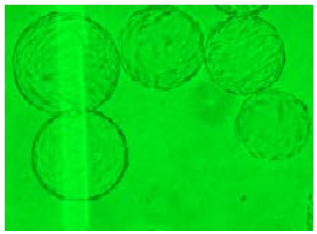
Toray Products (Pharmaceuticals)

Natural Human Interferon- β : Feron*

Establishment of large scale production technology (Beads culture)

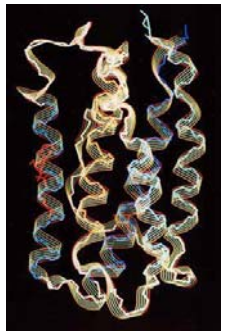


Fibroblast cells on the beads

The world first interferon product

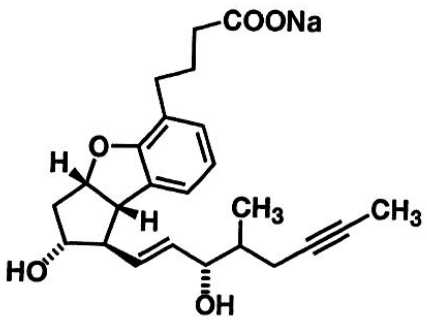
Launched in 1985 (Toray, Daiichi)

Indication: Hepatitis B & C
Melanoma/Brain tumors



World first structure elucidation of mouse interferon-β
(Tokyo Univ. & Toray)

Stable PGI_2 derivative (beraprost sodium): Dorner*/Procylin



Chemical structure of Dorner *

The world's first orally active PGI_2 derivative

Improvement in
- efficacy
- pharmacokinetics

Launched in 1992 (Toray/Astellas, Kaken)

Indications : Chronic Arterial Occlusion (ulcers, pain, chill)
Pulmonary Hypertension

Toray Products (Medical Products 1)

Filtryzer* • Toraysulfone*

1977 Filtryzer* Launched

Hemodializer made of PMMA hollow fibers with excellent absorption characteristics

1994 Toraysulfone* Launched

Hemodializer of polysulfone hollow fiber with high performance

Toraymyxin*

1993 Launched

Only one blood purification device on which polymyxin B immobilized

- Severe septicemia
- Integration of in-house technology(Chemical·Fiber·Plastic·Bio)

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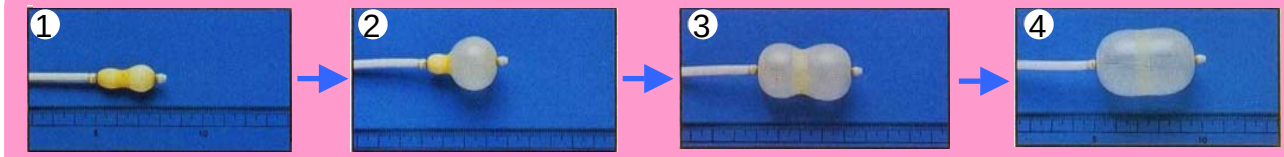
Toray Products (Medical Products 2)

Inoue- balloon Catheter

1988 Launched (Marketing in 80 countries world wide)

First catheter for treatment of mitral valve



Inflation of balloon

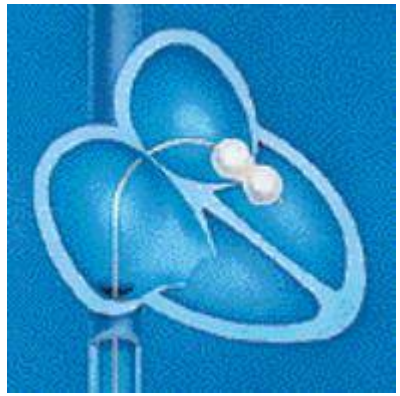


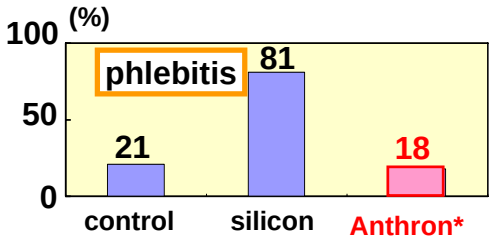
Image of treatment

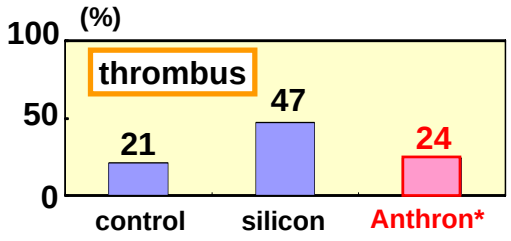
Anthron*

1986 Launched * Easy sliding in blood vessels and antithrombotic

Catheter coated with Anthron*(heparinized hydrophilic material)

Prevention of complication by thrombus at diagnosis or treatment

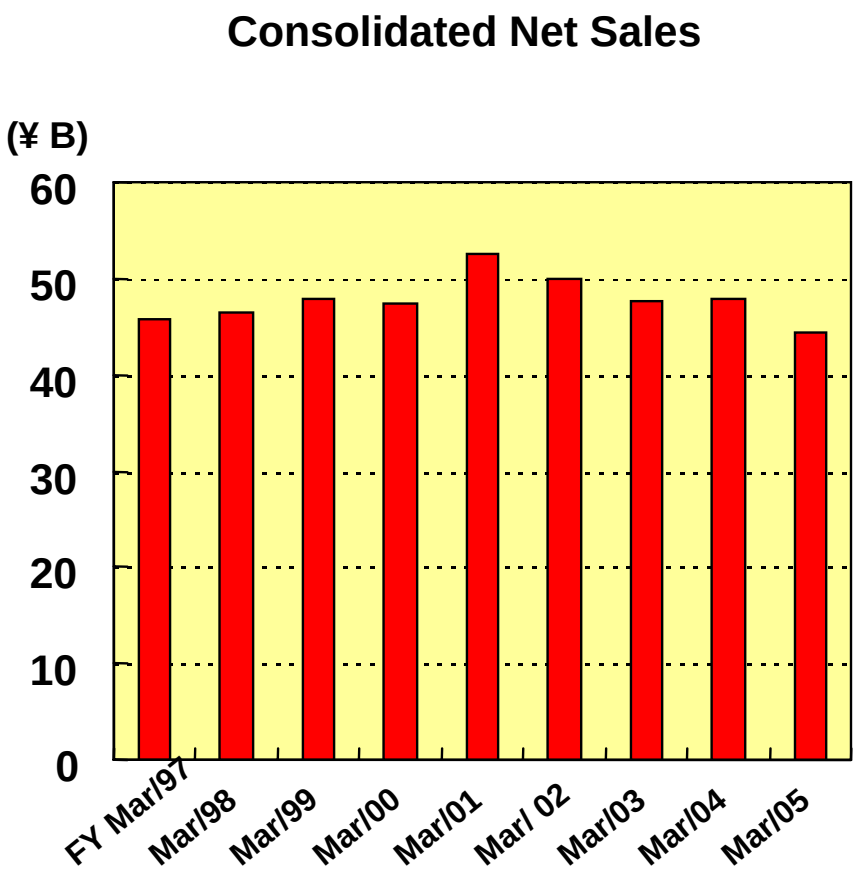




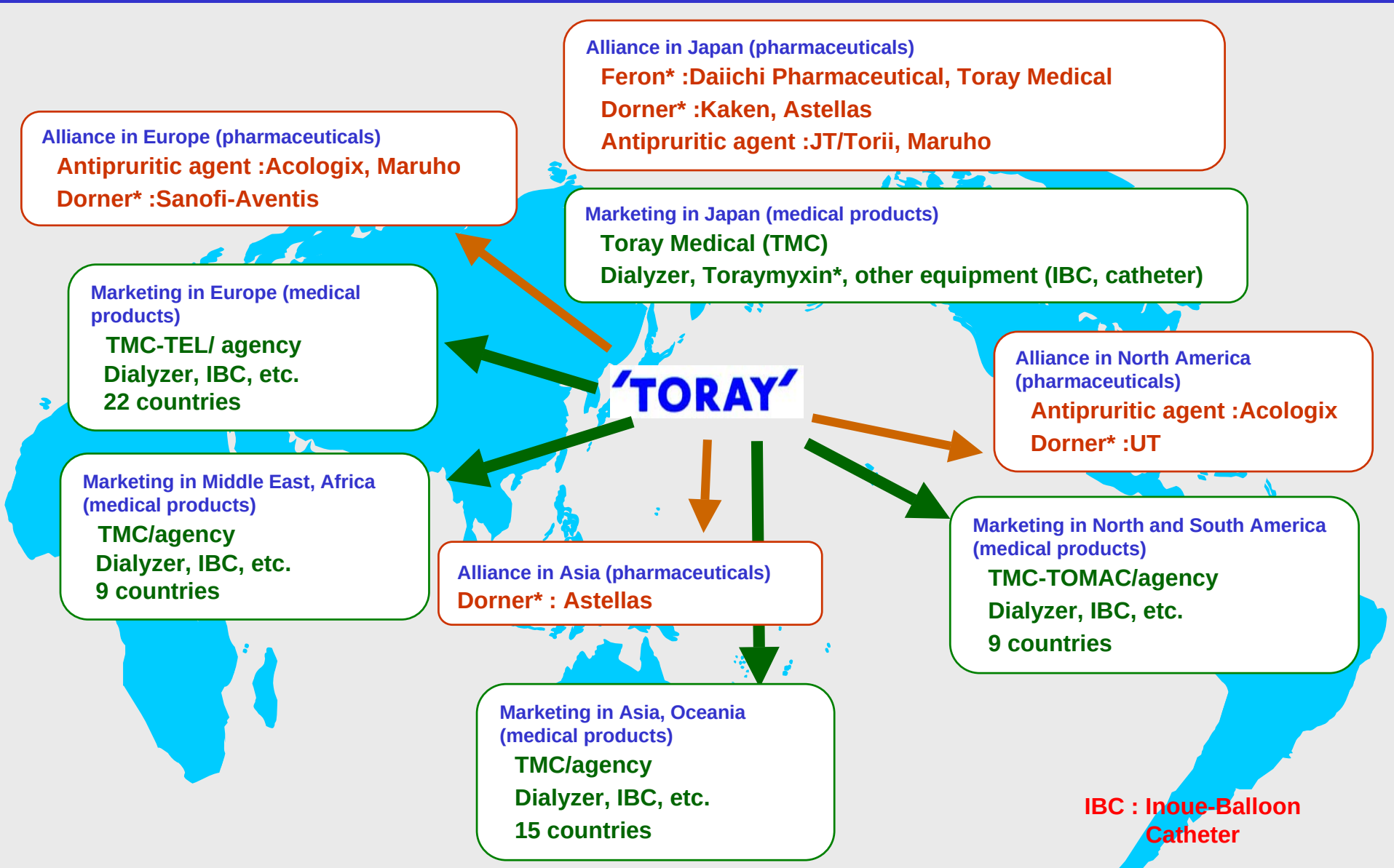
Appearance

Outer ø :ca.2mm
Inner ø :ca.1mm

Net Sales of Pharmaceuticals and Medical Products Businesses



Strategic Alliance in Pharmaceuticals Businesses and Marketing Network of Medical Products Businesses



Organization of Pharmaceuticals & Medical Products

Departments

Pharmaceuticals & Medical Products Division

- Pharmaceutical Operations Dept.
- Pharmaceuticals Planning Dept.
- Pharmaceuticals Manufacturing Dept. — Mishima
- Pharmaceuticals & Medical Products Administration Dept.
- Artificial Organs Operations/Planning Dept.
- Medical Devices Dept.
- Medical Device Production Dept. — Okazaki
- Medical Devices Manufacturing Dept. — Shiga, Seta

Affiliate ····· Toray Medical Co, Ltd. (TMC)

Technology Center

Clinical Development Center

- Pharmaceutical Clinical Research Dept.
- Clinical Research Administration Dept.
- Pharmaceuticals Technical Development Dept.
- Medical Devices Clinical Research Dept.

Research & Development Division

- Pharmaceutical Research Laboratories
- New Frontiers Research Laboratories
- Specialty Materials Research Laboratories

Regulatory Compliance Division

- Medical Products Quality Assurance Dept.
- Regulatory Affairs Dept.
- Pharmaceuticals & Medical Devices Vigilance Dept.

Characteristics and Basic Objectives of Pharmaceuticals Businesses

Characteristics of Pharmaceuticals Businesses

- Centralize resources in research oriented drug discovery and line extension of existing products
  Characteristics : Development of bio-active substances (interferon, prostaglandin, opioid, etc.)
  Creation of innovative drugs
- Clinical development : Mainly Toray in Japan, through alliance outside Japan
- Marketing : Consign marketing to appropriate business partner (new business model)
  Partial sales of Feron* at Toray Medical (TMC)
- Licensing to be one of business pillar

Basic Objectives

R&D for Drug Discovery : Focusing on innovative drug discovery in areas of unmet medical need

Line extension of existing products

- Strengthen profit-structure through sales expansion of existing product line and corporate-structure reinforcement
- Marketing will be done mainly through alliance for the near-term
- M & A is in vision as a constructive alternative

Antipruritic Drug (TRK-820)

New (antipruritic) drug for treatment of pruritus uncontrolled by current medication

Mechanism of Action: opioid kappa agonist **(Basic Patent)**

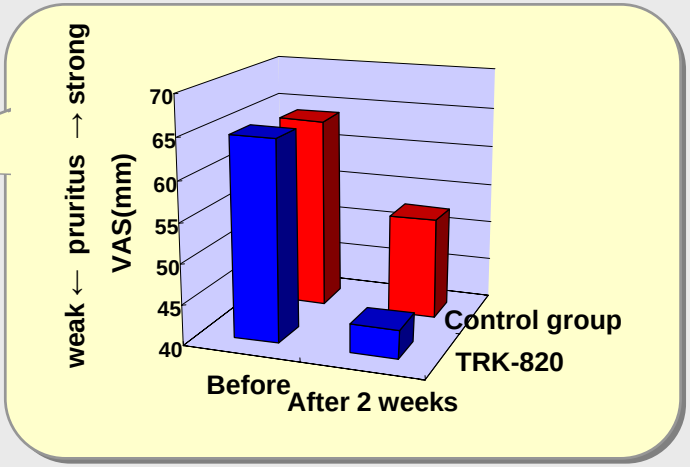
Characteristics:

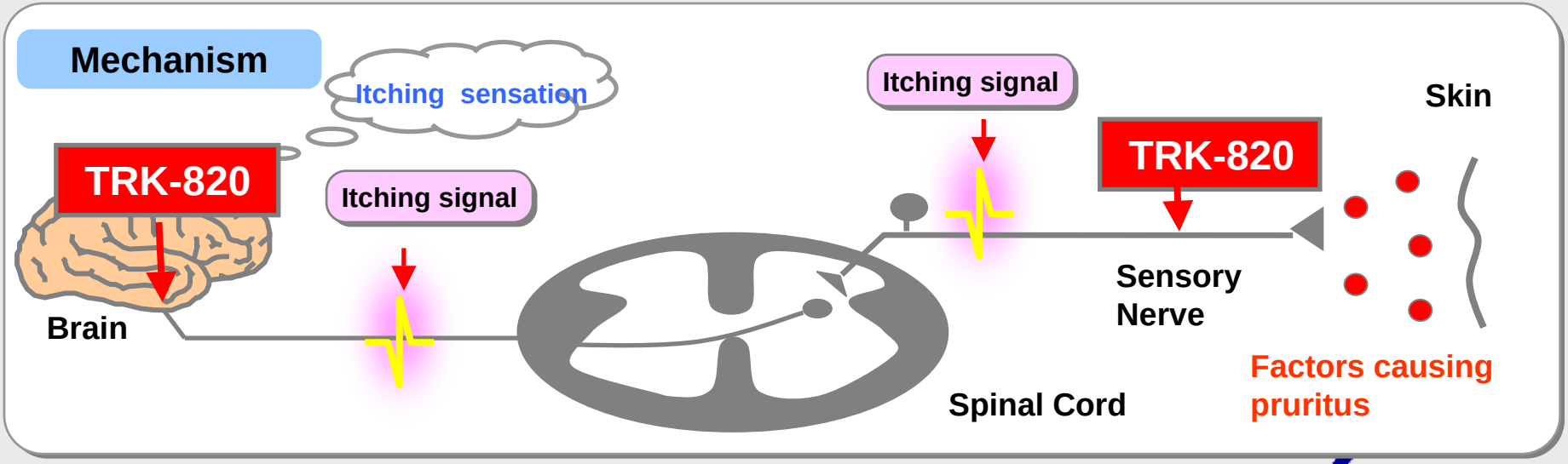
(1) Inhibition of pruritus in humans (5μ g/body) <right figure>

(2) No potential to induce dependency

Indication:

Intractable pruritus in hemodialysis patients, pruritus associated with liver injuries and skin diseases (atopy, pruritus senilis, etc.)





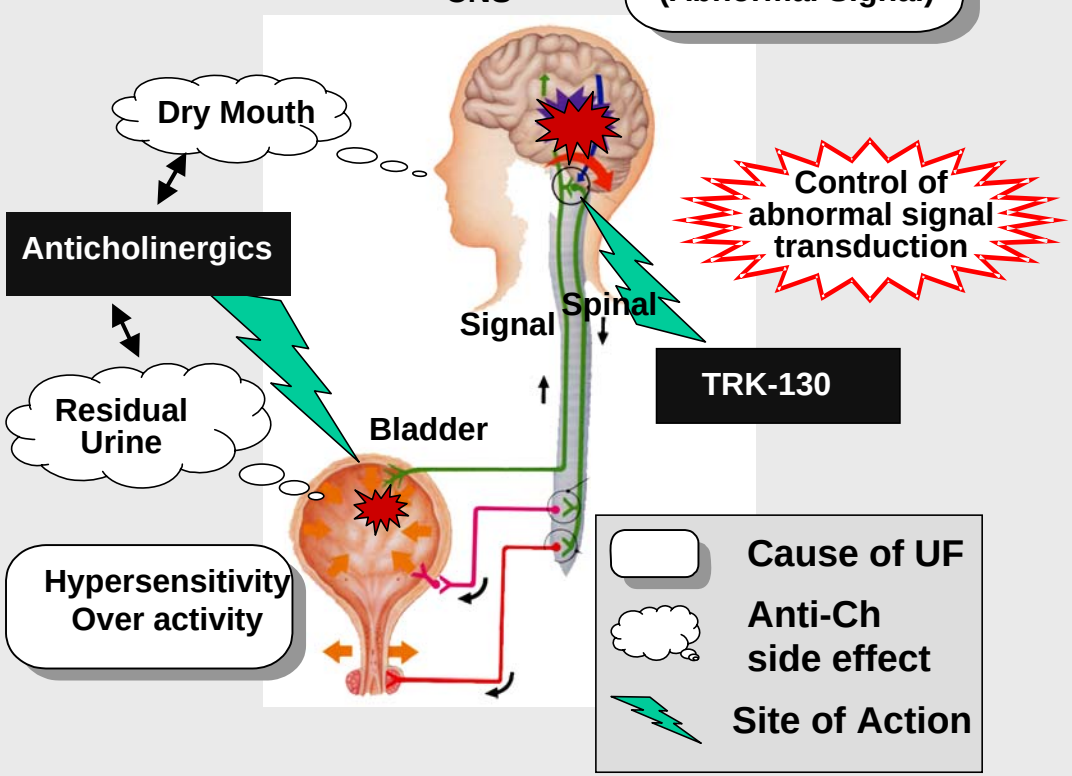
TORAY

Drug for Urinary Frequency (TRK-130)

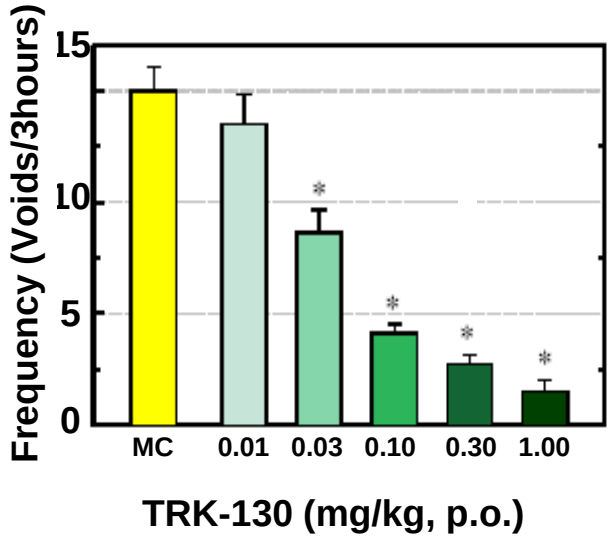
Non Anticholinergic Mechanism : Control of Neuronal Signal Transduction

Mechanism: Inhibit the abnormal signal transduction on overactive bladder **(Basic Patent)**
Characteristics: Free from Anticholinergic side effects (e.g. dry mouth, residual urine)
Indication: Overactive Bladder (Urinary Frequency (UF), Urinary Incontinence (UI))

Mechanism



Anti-UF effect



Analgesic for Moderate to Severe Pains (TRK-091)

Sustained-release tablets containing Tramadol Hydrochloride as an active ingredient (once-daily oral dose)

Analgesic Mechanism:

Weak opioid-receptor agonist having norepinephrin- and serotonin-reuptake inhibitory activity

Characteristics:

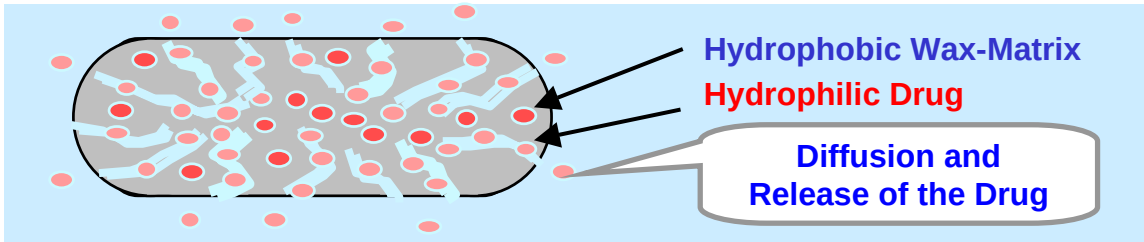
(1) Analgesic activity considered intermediate between nonsteroidal anti-inflammatory drugs (NSAIDs) and potent analgesics (morphine etc.)

(2) Reduction of the side effects observed in NSAIDs (gastrointestinal ulcer/hemorrhage, hepatopathy, nephropathy, etc.)

Indication:

Chronic pain (upper or lower back pain, osteoarthritis), cancer pain, post-operative pain

Release mechanism of Tramadol Hydrochloride in the matrix-type sustained-release tablets



Licensed from
Mundi Pharma

TORAY

Feron* / Dorner* slow released

Feron* : Liver cirrhosis / Combination therapy with Ribavirin for chronic hepatitis C

Characteristics : Antiviral and antifibrotic effects of Feron* delay the progress of liver cirrhosis and hepatocellular carcinoma in Chronic Hepatitis C patients

Background : Chronic Hepatitis C patients

World wide : 170 million patients (about 4 million people are newly infected with Hepatitis C virus each year in the world)

Japan : 2 million patients (WHO report 1999)

Many of Hepatitis C patients progress to cirrhosis and the cancer of liver

If progress to cirrhosis and the cancer of liver can be delayed, the meaning in the medical treatment is high

Dorner* slow released : Chronic renal failure / Pulmonary hypertension

Characteristics : Prevention of progression for chronic renal failure preceding ESRD for which existent drugs are insufficient

1. The concept was proved in pilot clinical studies in human and cat
   (1) increase of renal blood flow, (2) protection of blood endothelial cell, (3) prevention of inflammatory cytokine production
2. Sustained release formulation

Chronic renal failure :

- Existent drugs are insufficient
- 30,000 CRF patients enter ESRD a year in Japan
- Total number of ESRD patients : 250,000 (Japan)

Effect of Dorner* on renal blood flow in rats

TORAY

Basic Objectives of Medical Products

Characteristics of Medical Devices

- **R&D by in-house polymer technology and establishment of business in 3 areas**
  - **Dialysis : PMMA membrane, polysulfone membrane, machine**
  - **ER • ICU : Toraymyxin***
  - **Catheters : Inoue-balloon catheter, PU-Celsite, Anti-thrombotic catheter, Protect, etc.**
- **Integration of manufacturing & marketing (Toray • TMC)**
- **Ensuring business base through global expansion by TMC**

Basic Objectives

- **To create new products by frontier material technology**
  Business development by innovative devices for extracorporeal circulation and catheter for treatment of atrial fibrillation
- **Secure profit by efficient manufacturing and sales**

Development Pipeline of Medical Products

Dialyzer:Toraylite*

Plan for launch in 2006

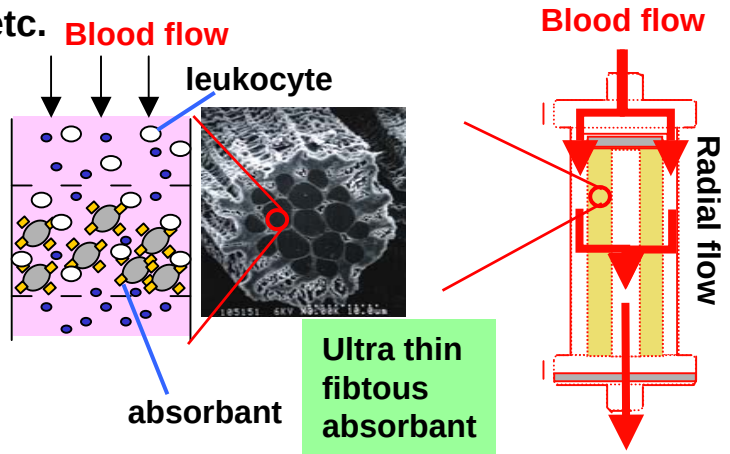
- Dried Toraysulfone*
- Characteristics: light, easy priming
- Patient No.(EU/US 500,000:Japan 250,000)

EU • ICU
Leukocyte removal column

Plan for launch in 2008

Removal of activated leukocyte

Indication:Crohn's disease, Ulcerative colitis etc.

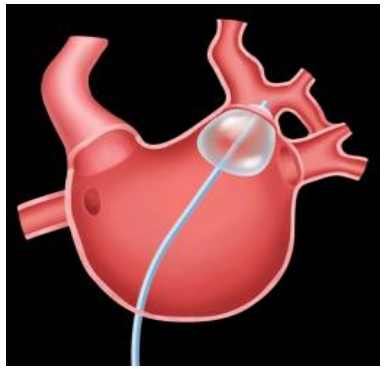


Catheter
Balloon for atrial fibrillation

Plan for launch in 2008

First balloon type ablation catheter in the world

Circular ablation:reduction of operation time



Balloon by X ray

TORAY

Summary : Expansion of Pharmaceuticals and Medical Products Businesses

- **Promote development of existing products to ensure business expansion in or around 2010**
- **Promote R & D of new pharmaceuticals and medical products for further business development in or around 2015**
- **Strengthen profit-structure through sales expansion of existing product line and corporate-structure reinforcement**

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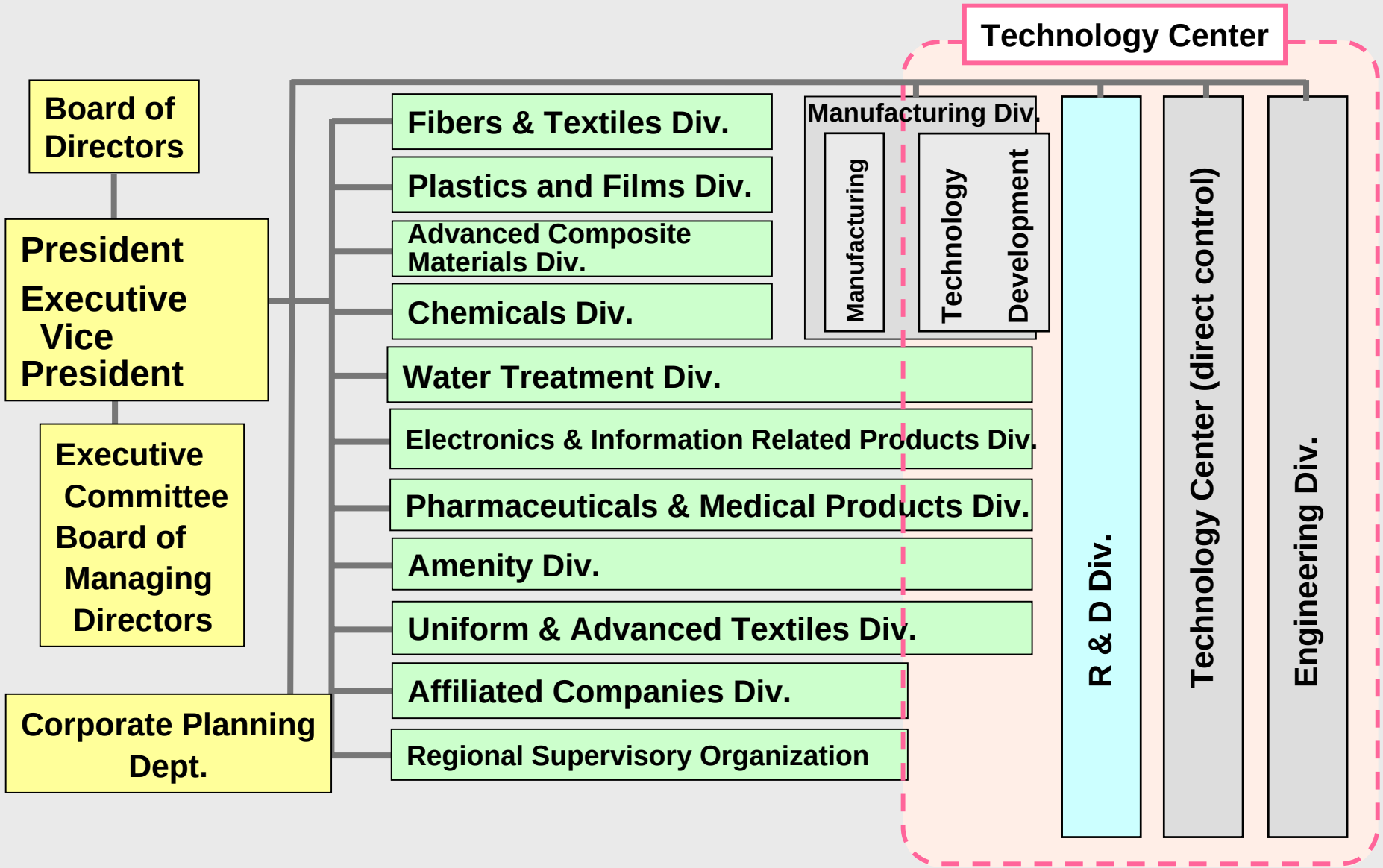
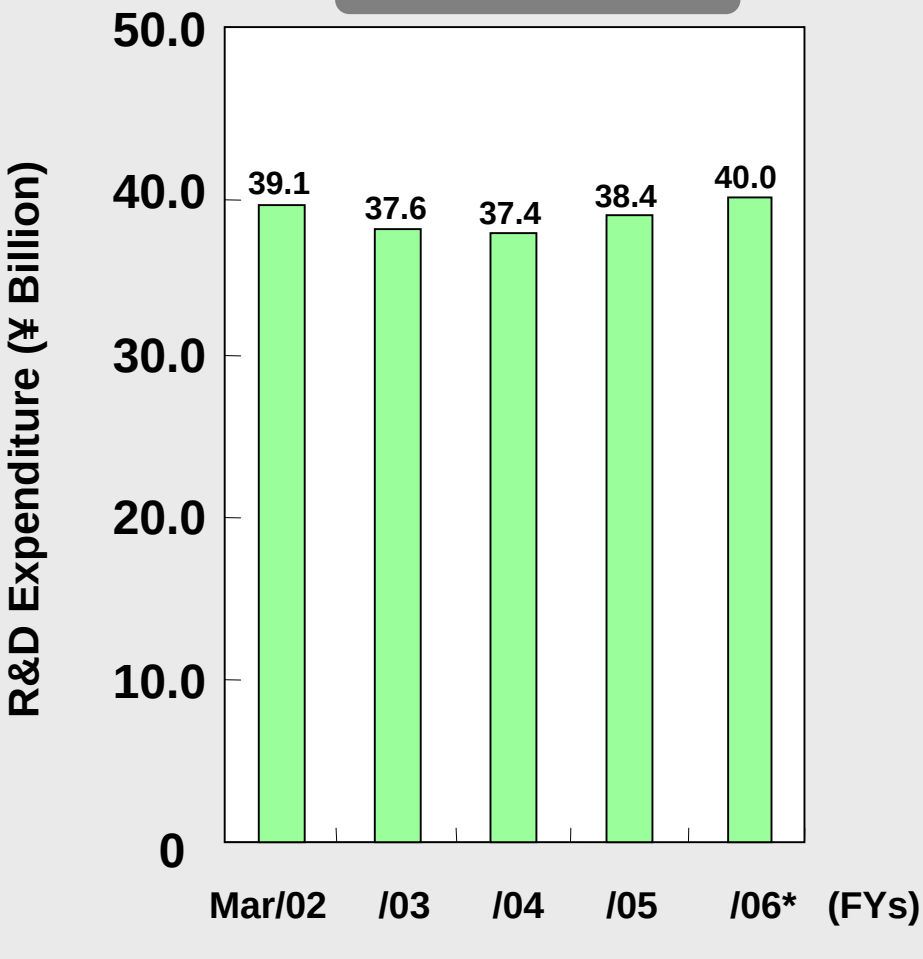
Organization of Toray Industries, Inc.

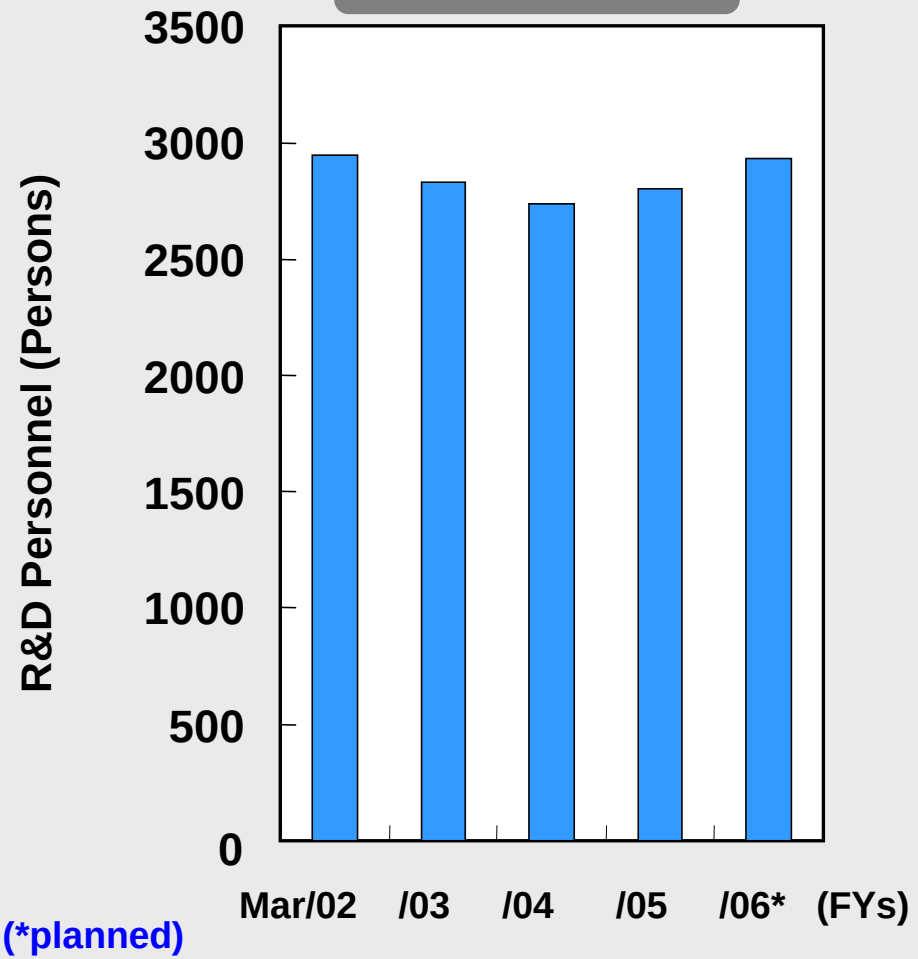


R&D Expenditure and Personnel

Approx. ¥ 40 billion



Approx. 2,900

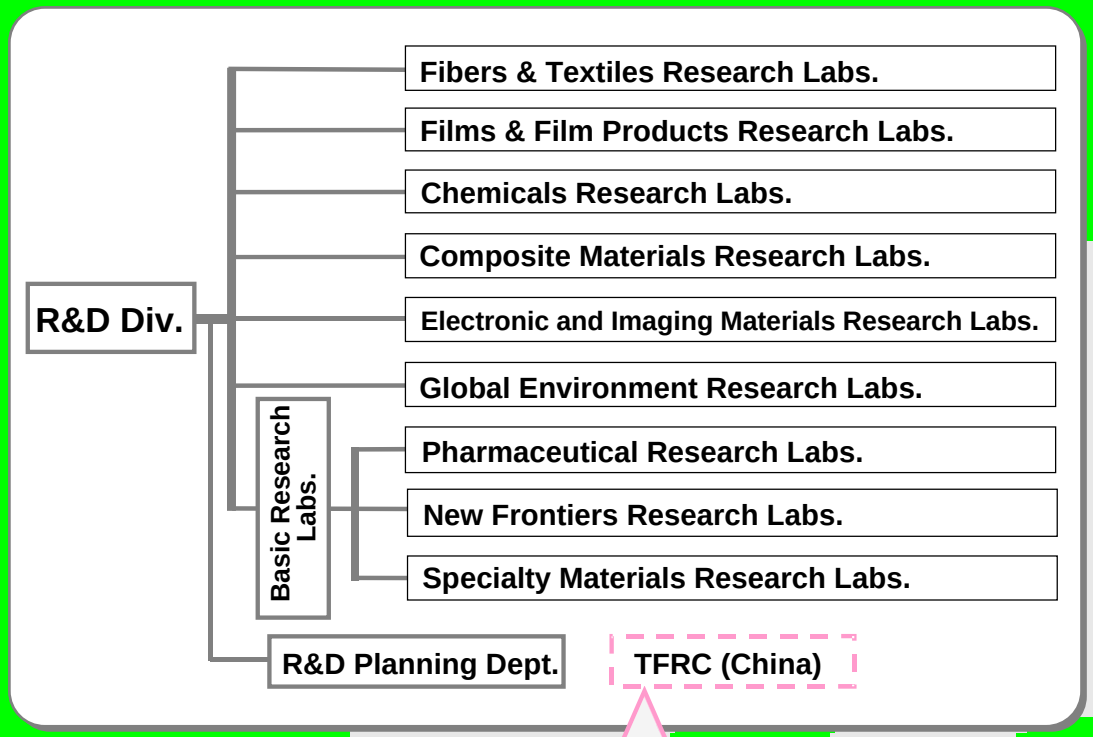


(*planned)

R&D Expenditures / Net Sales (excluding affiliated trading companies) ≒ 4.5%
(life sciences ≒ over 20%)

TORAY

Organization of R & D Division



Shiga Plant

- Films & Film Products Research Labs.
- Electronic & Imaging Materials Research Labs.
- Global Environment Research Labs.
- [Basic Research Labs.] Specialty Materials Research Labs. /Medical System Research Lab.
- R&D Planning Dept.

Tokyo Head Office

- R&D Planning Dept.
- Corporate Planning Dept.

Kamakura Plant

- [Basic Research Labs.] Pharmaceuticals & Medical Products Research Labs.
- New Frontiers Research Labs.

Nantong

- Polymers and fiber R&D Dept.
- Water Treatment Research Labs.

Shanghai

- Polymer Materials Research Labs.
- Water Treatment Research Labs.

Ehime Plant

- Composite Materials Research Labs.

Nagoya Plant

Chemicals Research Labs.

Mishima Plant

- Fibers & Textiles Research Labs.

TORAY

Features of Toray's R&D

Advantages

1. Culture and history that create innovative technologies
2. Various kinds of specialists groups in many fields
3. Unified R&D structure
4. Leading company in academia/industry / government collaboration
5. Advanced analytical capabilities : TRC

Technology Integration

Core Tech.

- Organic Synthetic Chemistry
- Polymer Chemistry
- Biochemistry

Advanced Tech.

- Nanostructure Design/Control
- New Polymer
- Bio/Nanotechnology
- Protein, Cell

etc.

Basic Tech.

- Carbon Nanotubes
- Genomic Drug Discovery
- Nanofabrication

etc.

Advanced Materials

- Nano-structured Materials
- Environmentally Friendly Materials
- Advanced Electronics Materials
- Advanced Display Materials
- Drug Discovery/ Innovative Therapy
- Bio/Nanobio Materials

etc.

Business Network

- Fibers & Textiles
- Plastics & Films
- Water Treatment
- Composite Materials
- Electronics & Information Related Products
- Chemicals
- Pharmaceuticals & Medical Products
- Amenity
- Uniform & Advanced Textiles
- Affiliated Companies

Foundation Businesses

IT-related Products

Life Sciences

Environment,Safety and Amenity

TORAY

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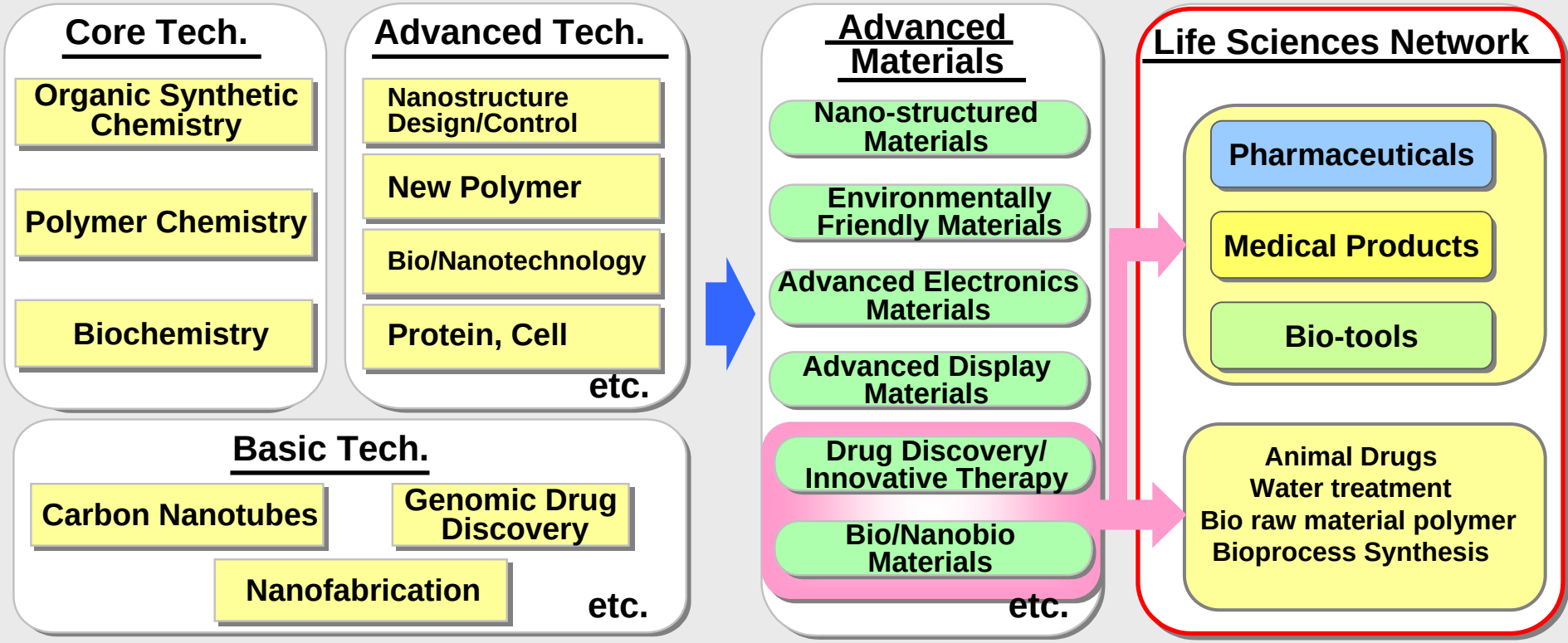
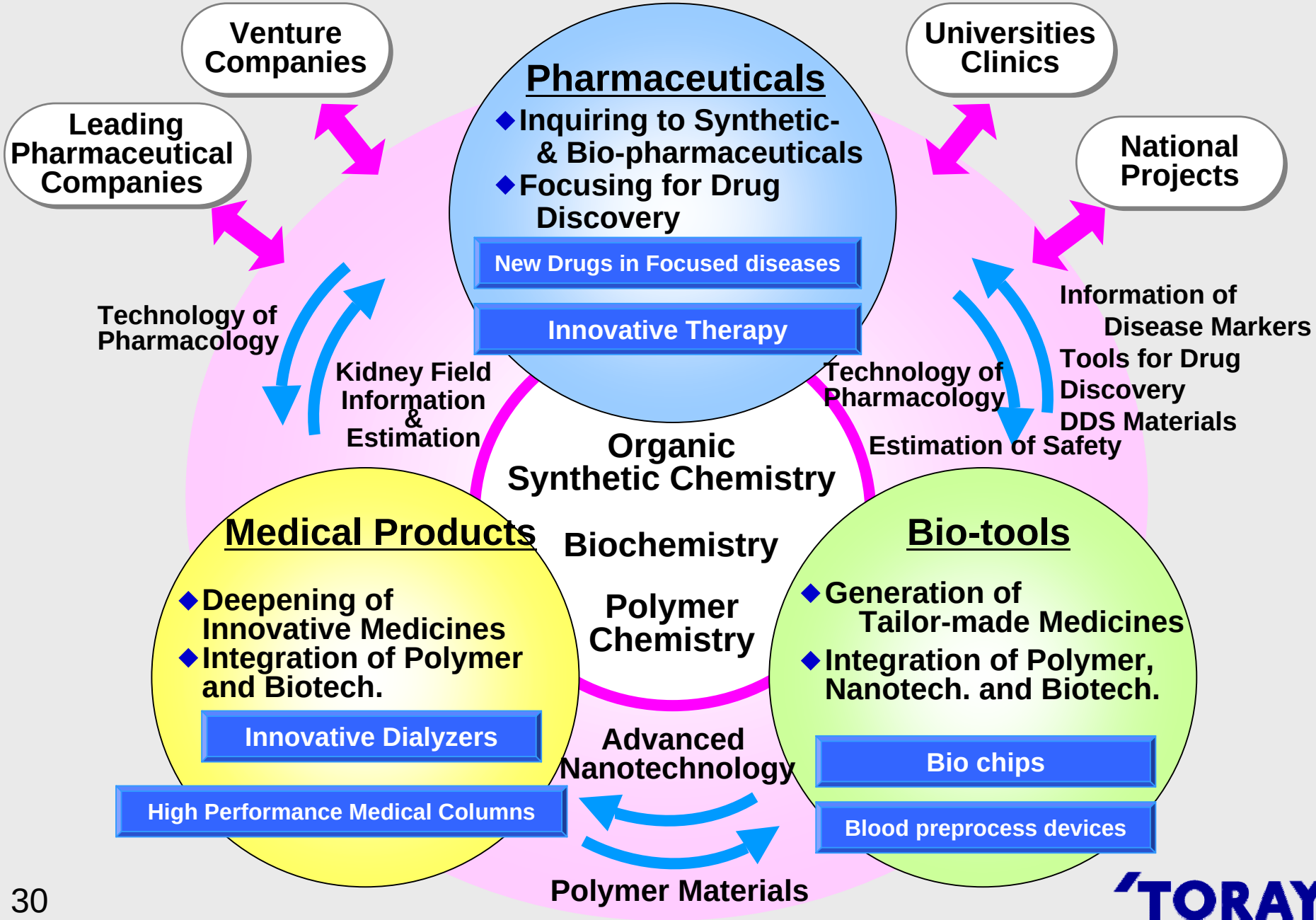
2. Various kinds of specialists groups in many fields
3. Unified R&D structure
4. Leading company in academia/industry / government collaboration
5. Advanced analytical capabilities : TRC

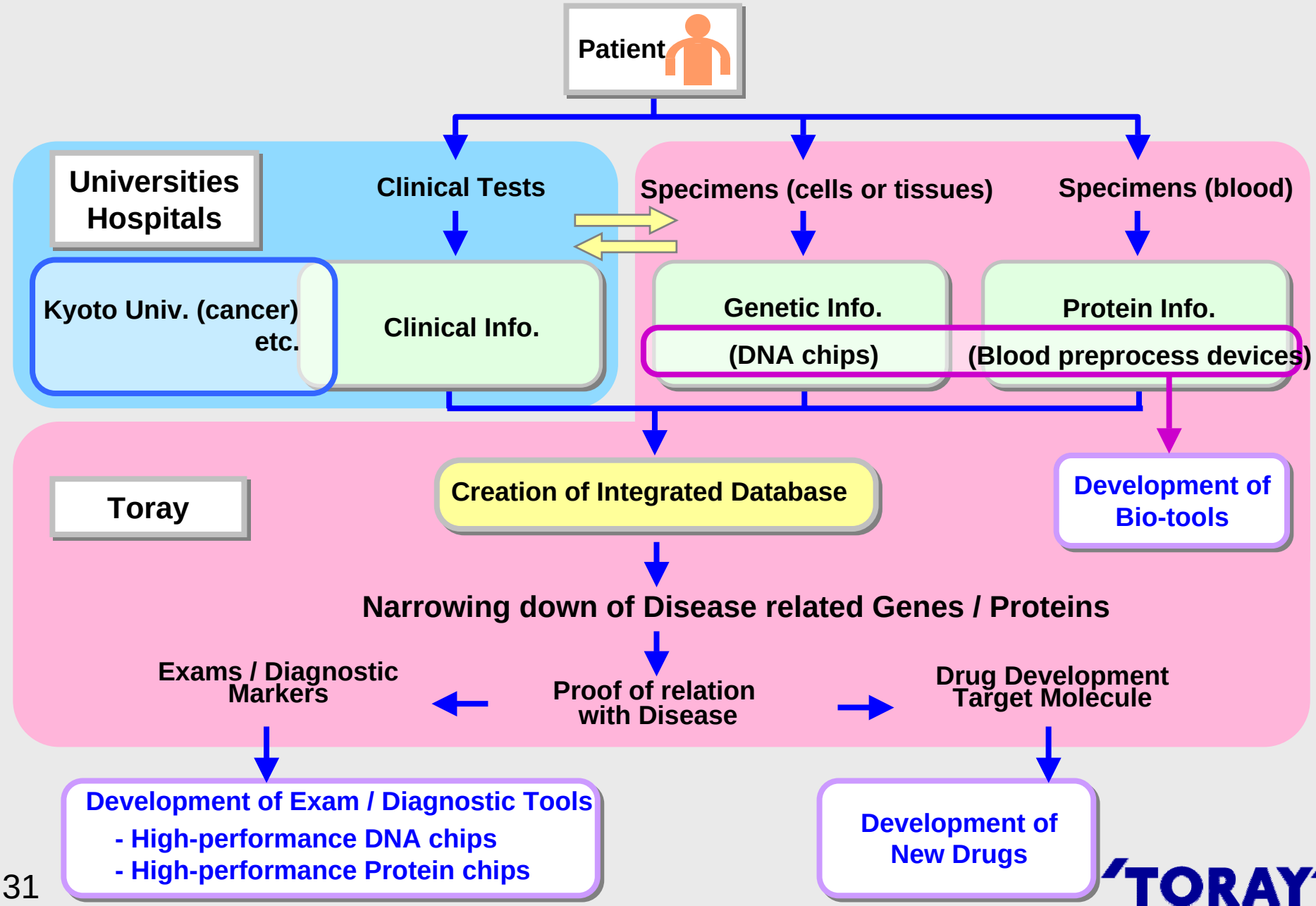
Technology Integration



R&D Policy in Life Science Fields

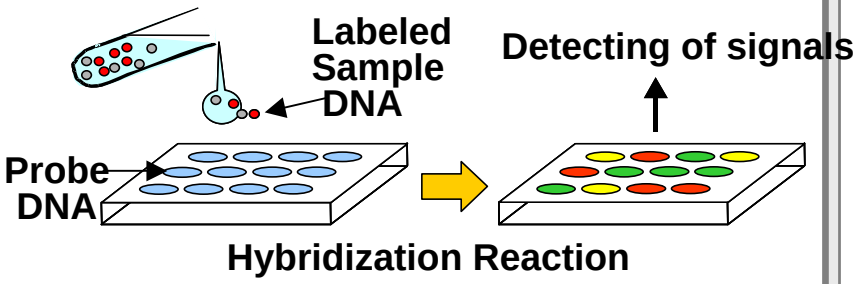


R&D Strategy of Bio-tools



High Performance DNA Chips

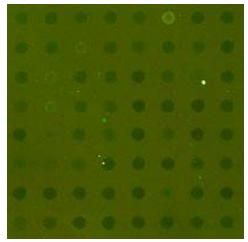
What is DNA Chip?



DNA Chips are tool for analyzing of gene Info.

Assignments of Conventional DNA Chip

(Glass substrate / Plane structure)

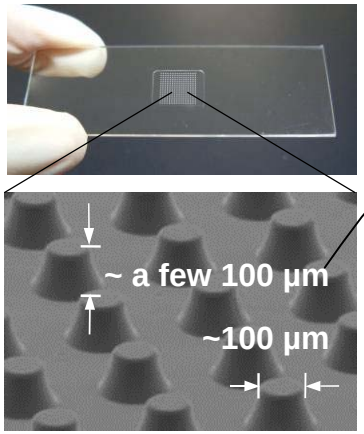


Sample amount of biopsy:1mg

- Signal<Noise
- Irregular for detecting
  : Low signal strength and stability

Low sensitivity
Low quantitativeness
Low reproducibility

High Performance DNA Chips

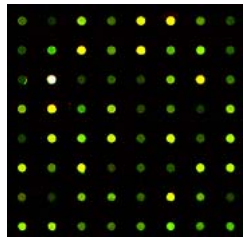


Original Resin

Probe DNA

Unique structure by micro fabrication

- High Signal
- Low noise



Sample amount of biopsy:1mg

High sensitivity
(Approx. 100-fold higher than conventional type)

High quantitativeness

High reproducibility

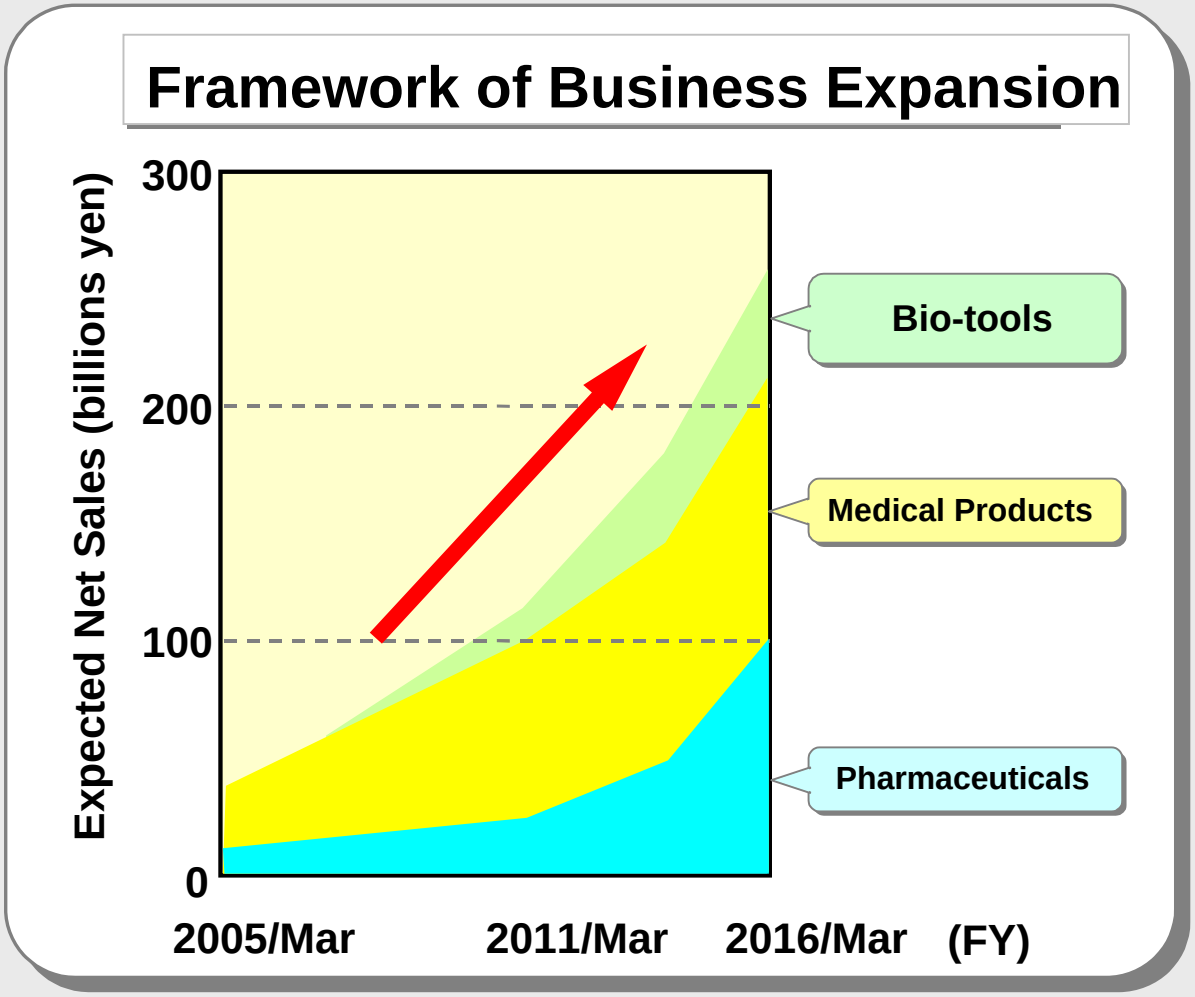
Short reaction time
(Approx. one-tenth of conventional type)

★ Development of DNA chip with unique structure by micro fabrication of original resin.

★ Realization of high sensitivity, high quantitativeness, high reproducibility and high speed detecting.

TORAY

Summary : Strategies for Business Expansion



★ Continuous introduction of new products strengthened by Toray's advanced materials and technologies

★ Accelerating speed of R&D by effective alliance formation

Descriptions of predicted business results, projections and business plans contained in this material are based on assumptions and forecasts regarding the future business environment, made at the present time.

The material in this presentation is not a guarantee of the Company's future business performance.