

Trend of Japan's S&T

Shigetaka ASANO, M.D., D.M.Sci.
On behalf of the SCA Committee of SCJ

- 1. Policy Development and Administrative System for S&T**
- 2. Movement toward 3rd S&T Basic Plan**
- 3. Roles of SCJ for S&T for Societies**



**Policy Development
and Administrative System for S&T**

Background

- **Aging and low-birth-rate society**
- **New S&T fields in combination or merger of different fields**
- **Rapid progress in life science with BT, IT and NT**
- **Global-scale problems confronting human beings**
global warming, food security, energy shortage, fresh water management, infectious diseases and preventions, disaster prevention/reduction, etc.
- **Increase of social and economic needs with increased expenditures on health care and social security**

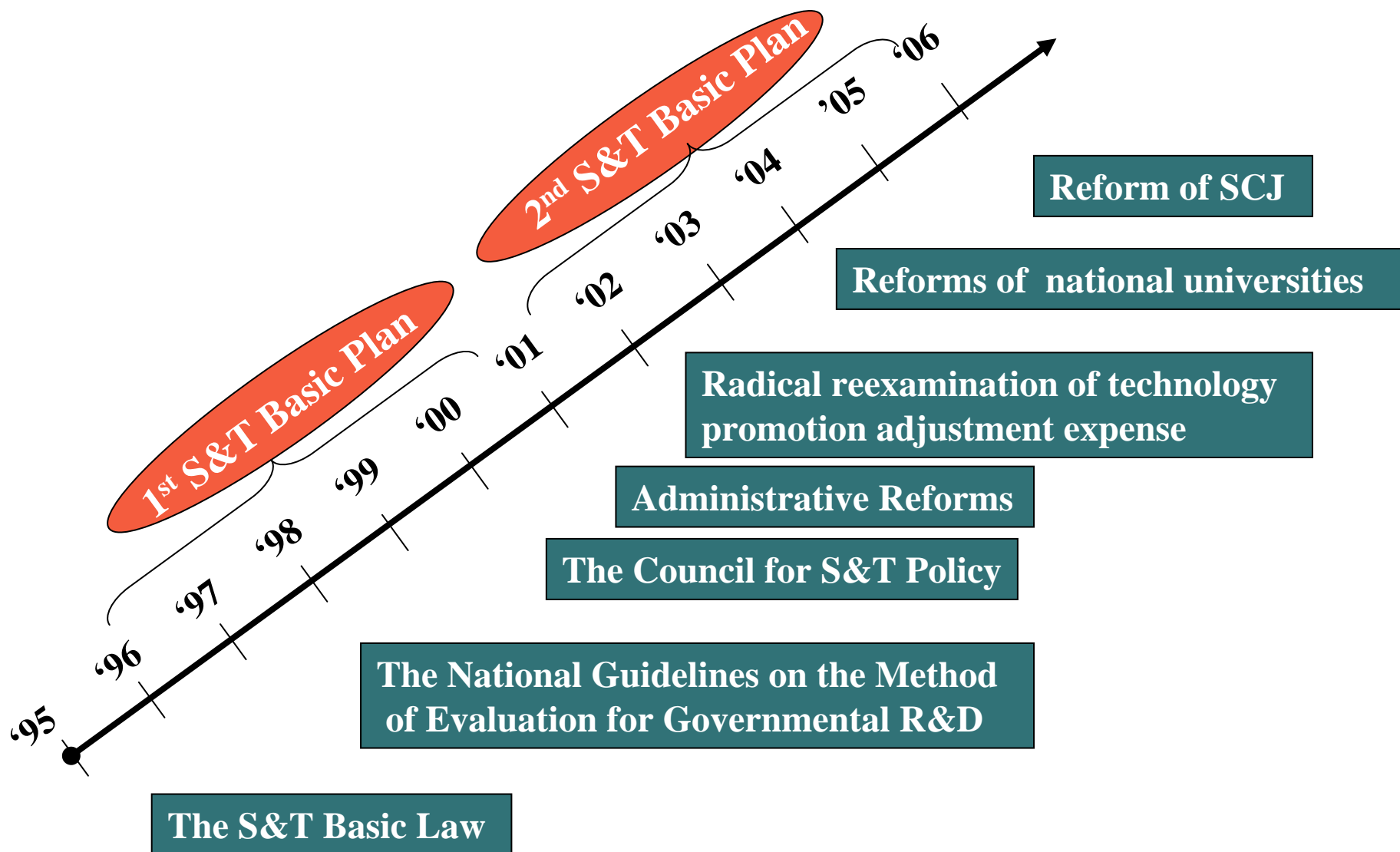
S&T will undoubtedly continue to exist as an irreplaceable asset to human beings.

Japan Vision

- **A nation contributing to the world by creation and utilization of scientific knowledge -*Creation of Wisdom-***
- **A nation with international competitiveness and ability of sustainable development -*Vitality from Wisdom-***
- **A nation securing safety and quality of life
*-Sophisticated Society by Wisdom-***

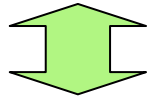
However, in terms of the relationship between science and technology and society, there are various aspects that comes with the changes of times. These include changes in the public awareness of S&T, and increased national interest about society's safety and the feeling of being safe.

The Flow of the S&T Policy in Japan



S & T Administration in Japan

Prime Minister



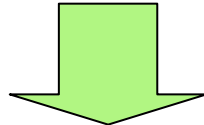
Implementing comprehensive strategy by assisting the Prime Minister

Cabinet Office

Minister of State for S&T Policy

Council for S&T Policy (CSTP)

**Atomic Energy Commission
Nuclear Safety Commission**



Presenting a basic policy comprehensive coordination

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Considering the basic policies on S&T formulated by CSTP, MEXT makes and promotes concrete plans for R&D and coordinates relevant ministries

Council for S&T

CSTP

- *the highest deliberative body for S&T policies*
- *established in the Cabinet Office in January 2001*
- *composed of 6 cabinet members, 7 scientists(3 full-time), and the SJC president*

- **Basic steering of S&T policies**
- **Promotion of R&D in prioritized areas**
- **Policy on resource allocation**
- **Promotion of nationally important projects**
- **Settlement of national guidelines for important policies**
- **Evaluation (large-scale R&D, each ministry)**
- **Follow-up of the basic plan**

MEXT

- **Designing, planning, promoting, and coordinating basic policies on S&T**
- **Promotion and evaluation of R&D in important fields**
- **Concrete efforts toward reform of the S&T system**

Movement toward 3rd S&T Basic Plan

	<i>1st S&T Basic Plan(1996-2000)</i>	<i>2nd S&T Basic Plan(2001-2005)</i>
<i>Basic Policies</i>	<ul style="list-style-type: none"> •Implementing policies to achieve the principle as structuring new R&D system •Realizing desirable R&D basis • Promoting education concerning S&T •Forming a national consensus on S&T 	<ul style="list-style-type: none"> •Strategic priority setting in S&T •S&T system reforms to create and utilize excellent results •Internationalization of S&T activities
<i>Budget</i>	About 17 trillion yen for 5 years	About 24 trillion yen for 5years
<i>Problems</i>	<ul style="list-style-type: none"> •Lack in motility of human resources •Poor research facilities •Deterioration of industrial competitiveness •Ineffective industry-academia-government collaboration •Lack of the top-down comprehensive initiative of the S&T policies 	<ul style="list-style-type: none"> • Unnecessary duplication due to administrative sectionalism • Lack of integrated international cooperation (policy dialogue with the Asian countries) • Continued deterioration of industrial competitiveness

Strategic Priority Setting in S&T

1. Promotion of basic researches

2. Priorization of R&D on national/social subjects (to be set on intellectual assets enhancement, economic effects, social benefits)

(1) *Life sciences*

(2) *Information and telecommunications (IT)*

(3) *Environmental sciences*

(4) *Nanotechnology and materials*

(5) *Energy*

(6) *Manufacturing technology*

(7) *Infrastructure*

(8) *Frontier- outer space and the oceans*

(9) *Emerging field*

S&T System Reforms to Create and Utilize Excellent Results

1. R&D system reforms

(1) System building to generate excellent results

Establishment of competitive R&D environment (increasing the amount of competitive funds, allocating funds for indirect expenses, handing of basic expenses)

Mobilization of human resources using fixed-term appointment

Self-reliance of young researchers

Reform of evaluation systems (securing fairness and transparency)

Flexible, effective, and efficient management of R&D systems

Utilization of qualified persons and development of a variety career paths

Realization of creative R&D systems

(2) Promotion and reform of R&D in major organizations

Universities and other academic institutions

National research institutes and other institutes

Private companies

2. Reinforcement of industrial technology and reform of industry-academia-government collaboration

3. S&T promotion in regions

4. S&T human resource development and S&T educational reforms

5. Interactive channels between S&T and society

6. Ethics and responsibility on S&T

7. Maintenance of infrastructure for S&T promotion

Internationalization of S&T activities

- 1. Initiatives in international cooperation**
- 2. Enhancement of international information dissemination**
- 3. Internationalization of domestic research environments**

Governmental S&T Promotion Expense

Promotion capital for strategic important research formation (MEXT)

Competitive capital

Subsidy for science research cost

R&D Promotion adjustment expense

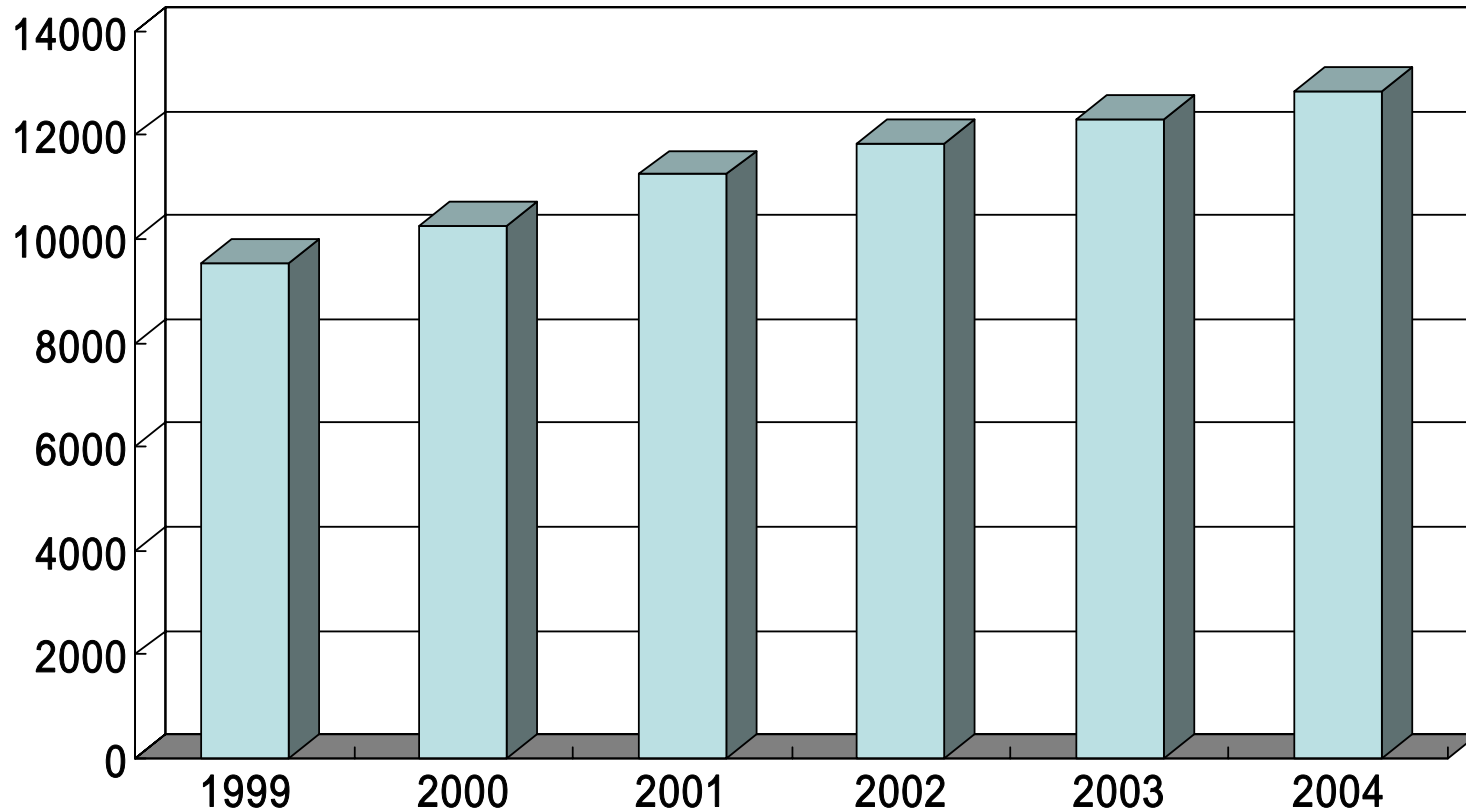
Promotion subsidy for reformist technology development research

Promotion expense for earth-environment research

Subsidy for welfare science research cost

Cost for basic research promotion system
(by the special public corporative organizations)

S&T Promotion Expense



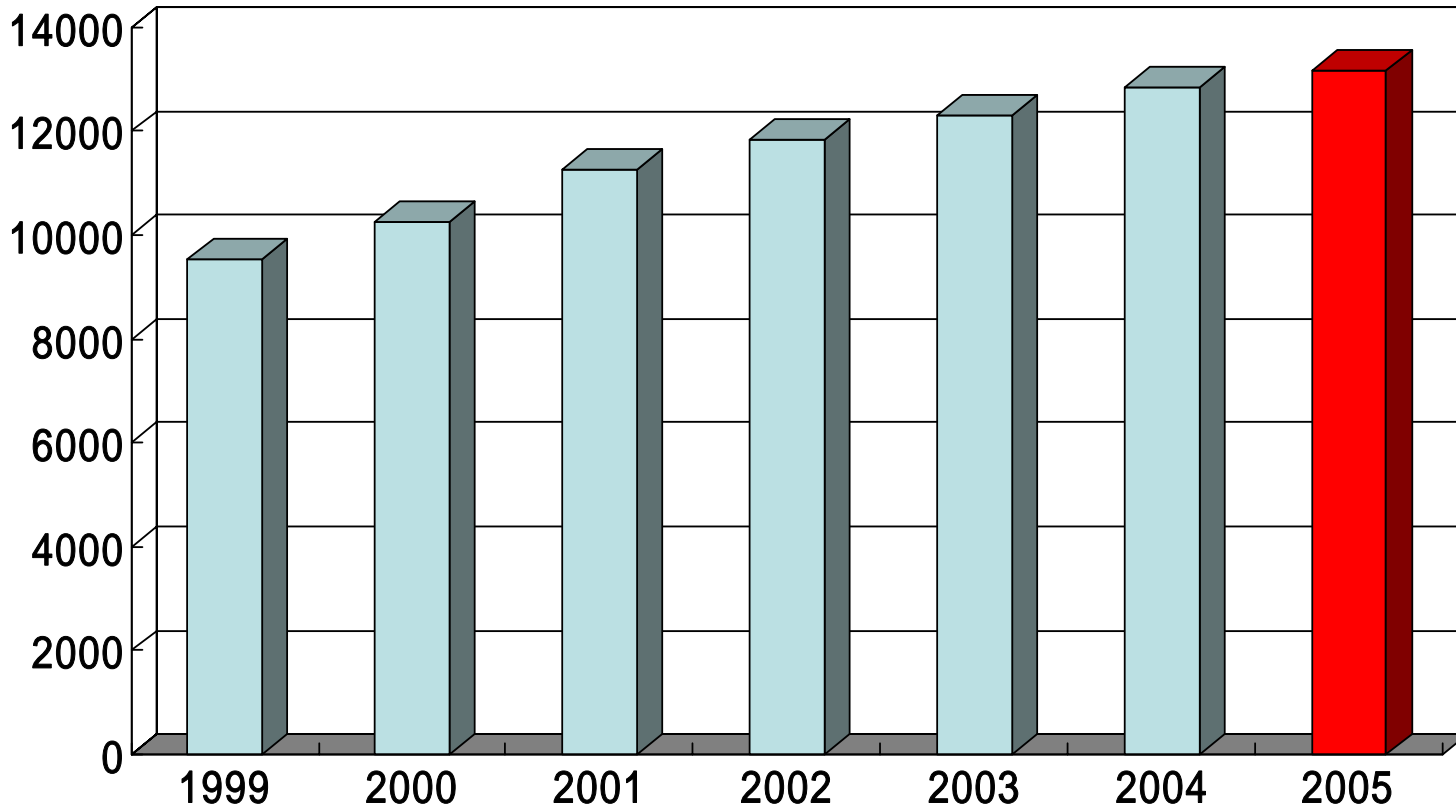
In 2005, although general expenditures are in the severe financial situation of the decrease of 0.7%, it increases with 1,317 billion yen of the increase of ratio 2.6% for the preceding year.

<i>Problem</i>	<i>Solution</i>
<ul style="list-style-type: none"> • Unnecessary duplication due to administrative sectionalism • Restrictions of budget amount • Low propriety of proposed research planning • Severe burden to smaller companies • Poverty of the autonomy in international research activities, <i>etc.</i> 	<ul style="list-style-type: none"> • Effective promotion of inter-ministry cooperative area researches and of important subject-solution-type research, <i>etc.</i> • Investigation of nationally-important critical technology to be selected • Proper dealing with ethical, legal and social subjects • Expansion of education institution for human resources (re-education of company researchers, <i>etc.</i>) • Promotion of internationally-cooperative activities (international conferences or investigations) • More widespread use of the leading large-sized institutions/equipments • Development of advanced analyzing equipments, <i>etc.</i>

Eight Inter-ministry Cooperative Prioritized Areas and Expenditure Allocation for Them

<i>Area (Project number accepted)</i>	<i>Budget, billion ¥</i>
Post-genome (12)	99.1
New/revival infections (10)	13.3
Ubiquitous network (8)	9.2
Robot of next-generation (12)	5.6
Practical use of biomass (13)	11.2
Hydrogen use/fuel cell (20)	37.3
Nano-biotechnology (10)	15.3
Regional S&T cluster formation (15)	85.3

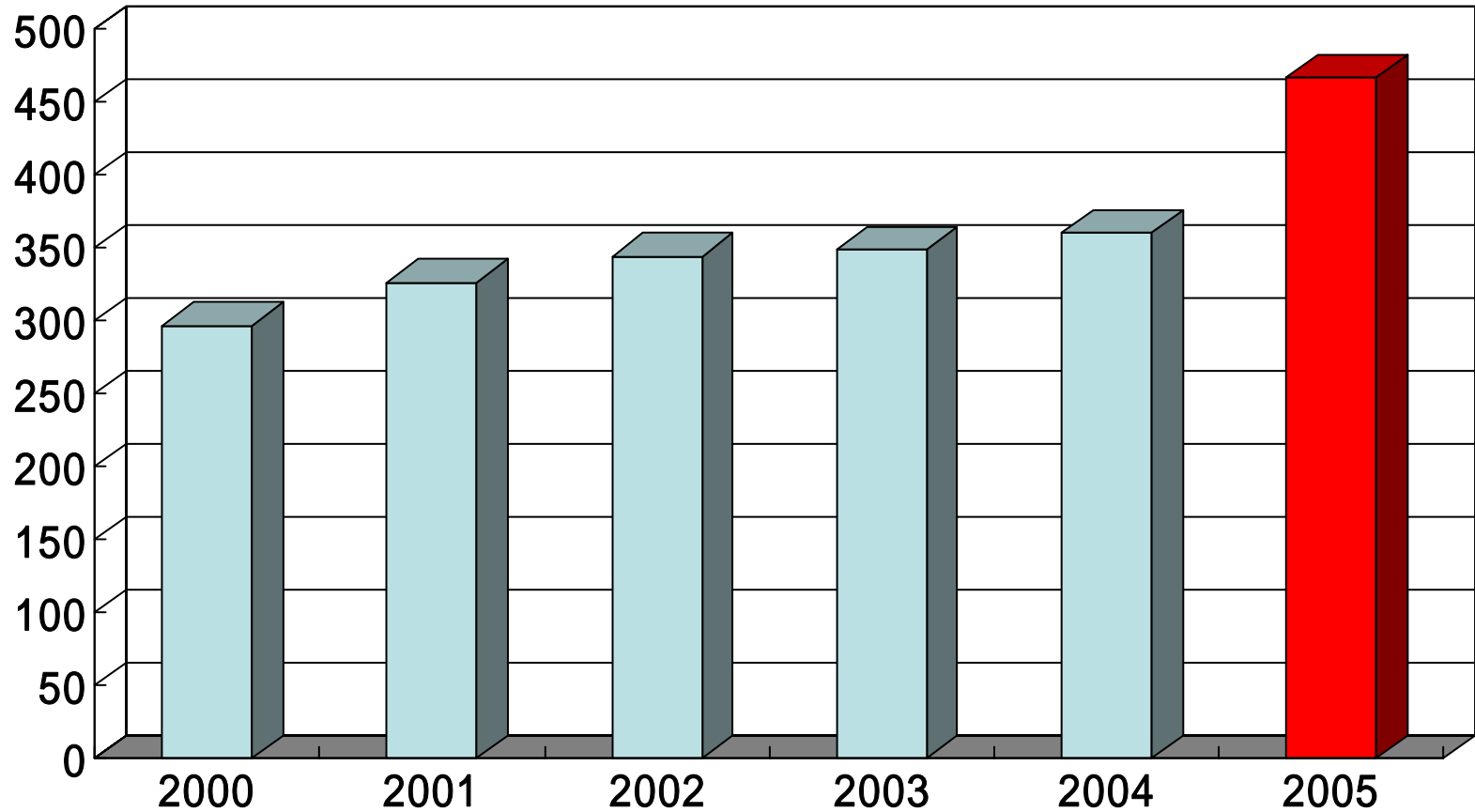
S&T Promotion Expense



In 2005, although general expenditures are in the severe financial situation of the decrease of 0.7%, it increases with 1,317 billion yen of the increase of ratio 2.6% for the preceding year.

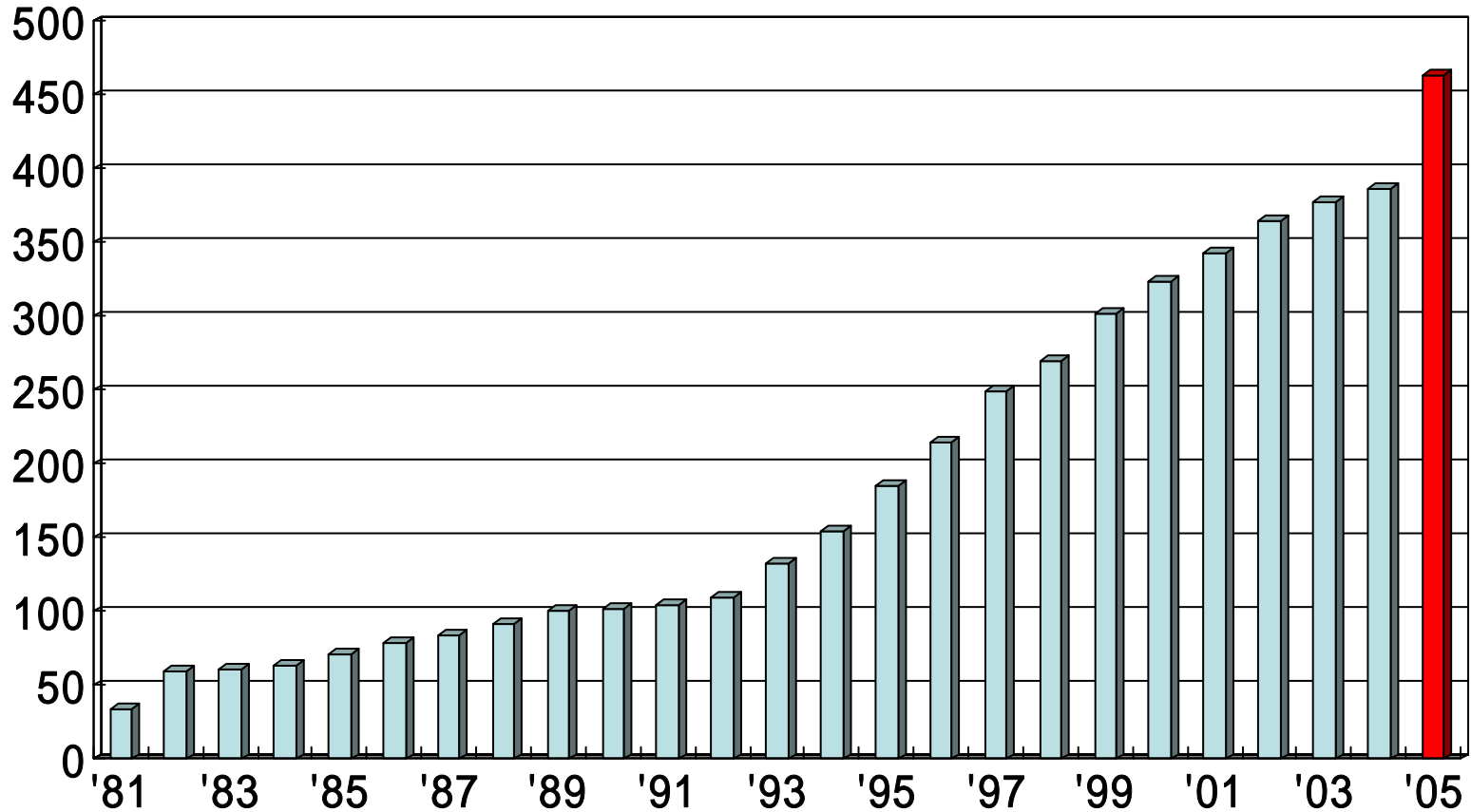
Competitive Research Fund

Trillion yen



R&D Promotion Adjustment Expense

Yen



Large-sized Research Institutions/Equipments

Spring-8
High-energy photon accelerator
Ring cyclotron
Earth-simulator
Super-kamiokande
E-defence, etc

Roles of SCJ for S&T for Societies

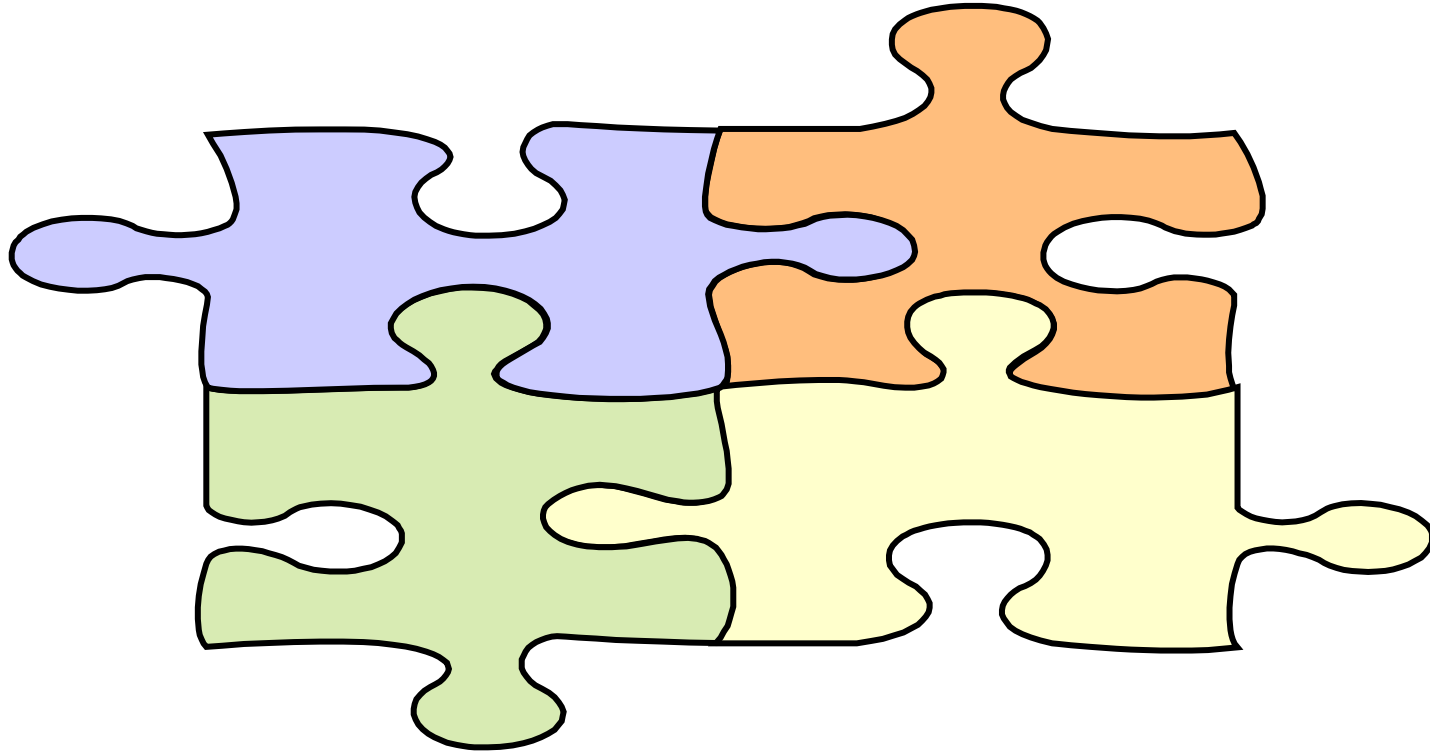
The economically and environmentally sound science and technology policy must built that encompasses the coming fiscial years 2006

National Museum of Innovation completed in July 2001

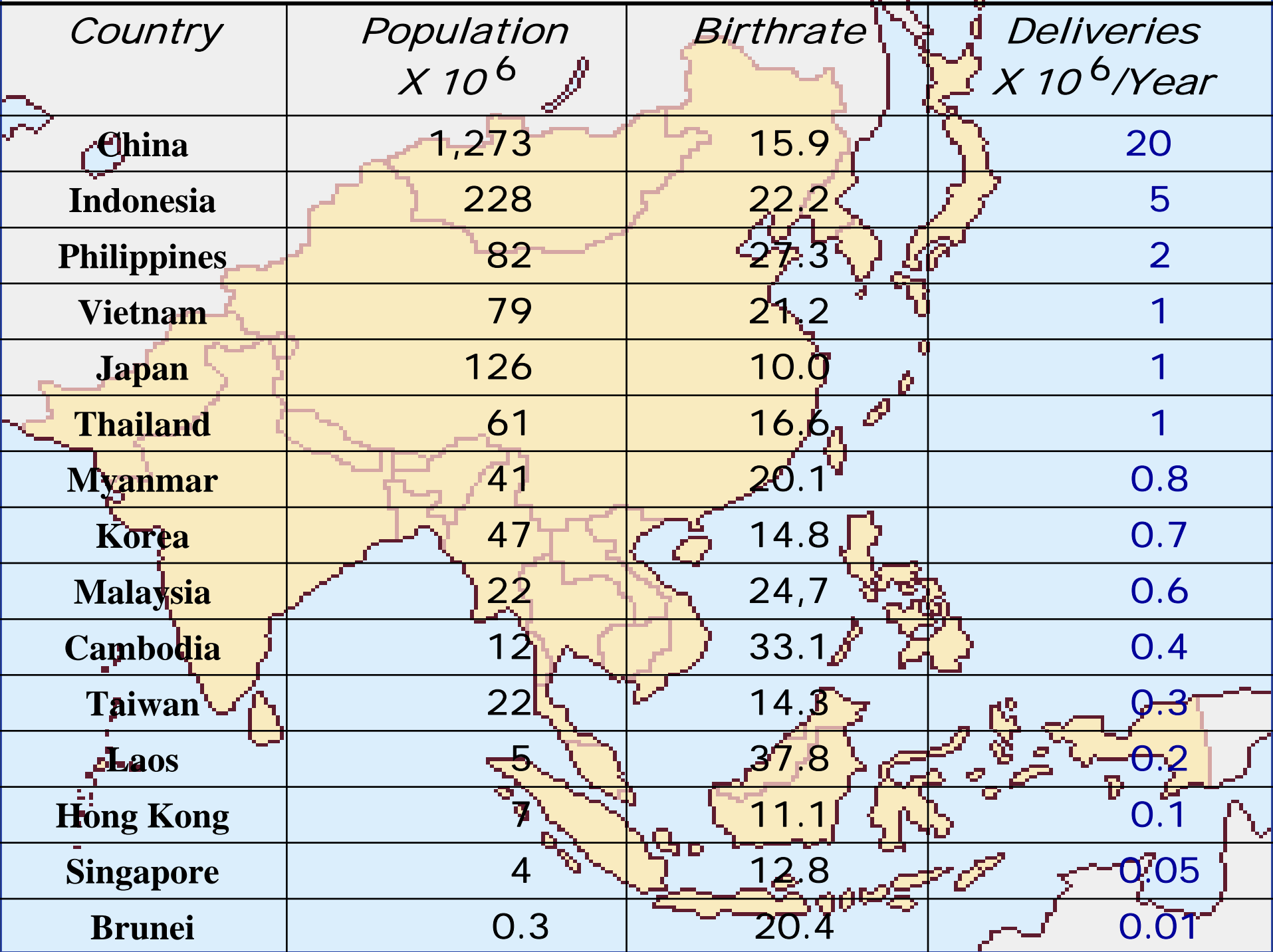


The community of scientists which are represented by the SCJ is currently expected to play a important role from the bottom up for contribution to the building of a well-balanced autonomous system as a group of experts with highly-specialized abilities, with a responsibility toward S&T governance.

Asian Harmonization via Cord Blood Bank Network



*Introduced by Shigetaka Asano
Of Tokyo Cord Blood Bank*



Asia CordbloodBank LINK
 Tokyo | Taipei | Beijing | Seoul | HoChiMinhCity | Bangkok

Search

How to Search for CB Units in AsiaCORD by FAX(1)
 How to Search for CB Units in AsiaCORD by Web(2)

AsiaCORD

Purpose
 The purpose of AsiaCORD is to promote a pan-Asian supply of cord blood (CB) units, because of the higher frequency of HLA matching within Asian populations. In order to establish this network in Asia, a major requirement is establishment of international standards of cord blood banking.
 To realize this, we will first start to run searching for cord blood units in AsiaCORD members. Subsequently, we hope this will lead transplant medical teams to searching for cord blood units which are located in other cord blood banks in Asia as well.
 In the near future, we are to establish the minimum requirements for cord blood banking, and to make guidelines Asia-wide with overriding country differences. Then, we will be able to guarantee the quality of cord blood products, and assure their clinical safety and effectiveness.



Copyright © 2007 AsiaCORD All Rights Reserved.
 Division of Cell Processing The University of Tokyo
 230-8501 4-6-1, Minato-ku, 109-0039, Tokyo, Japan.
 TEL: +81 (0)5449-5099
 FAX: +81 (0) 5449-5452



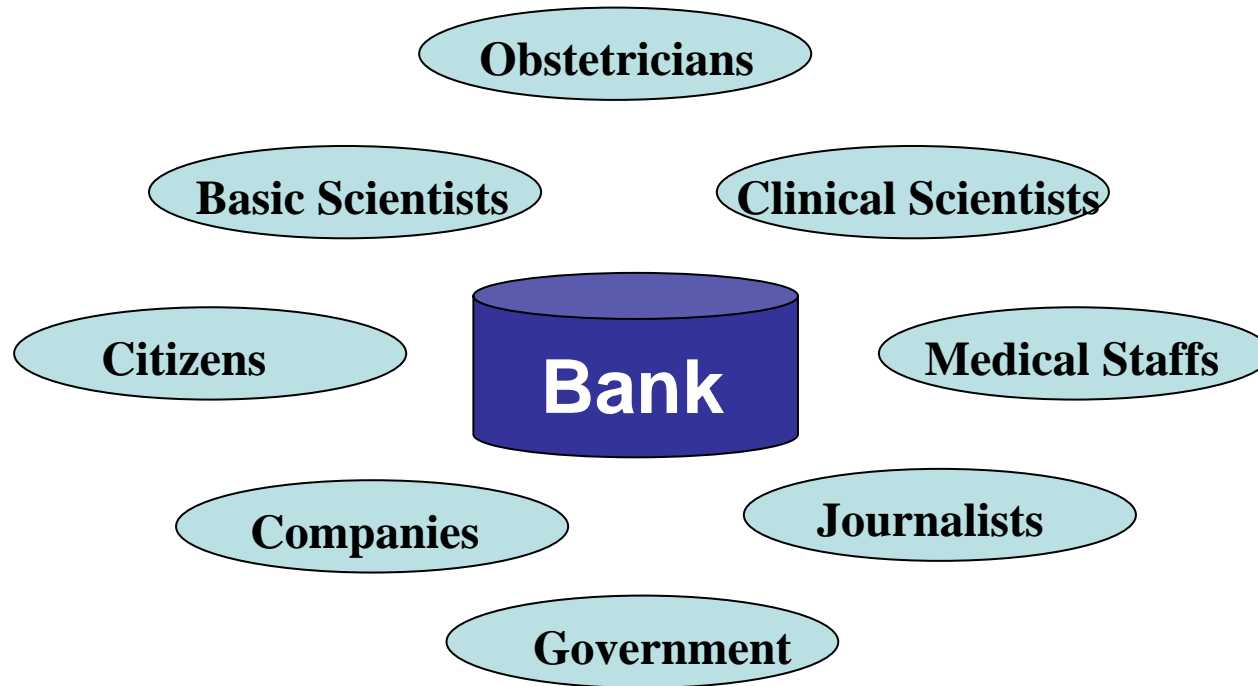
Current Activities as a Candidate of SCA Project

- Creation of a guideline for the minimal requirements
- Mutual inspection
- Exchanging information
- International symposium
- Website

<http://www.asiacord.org>

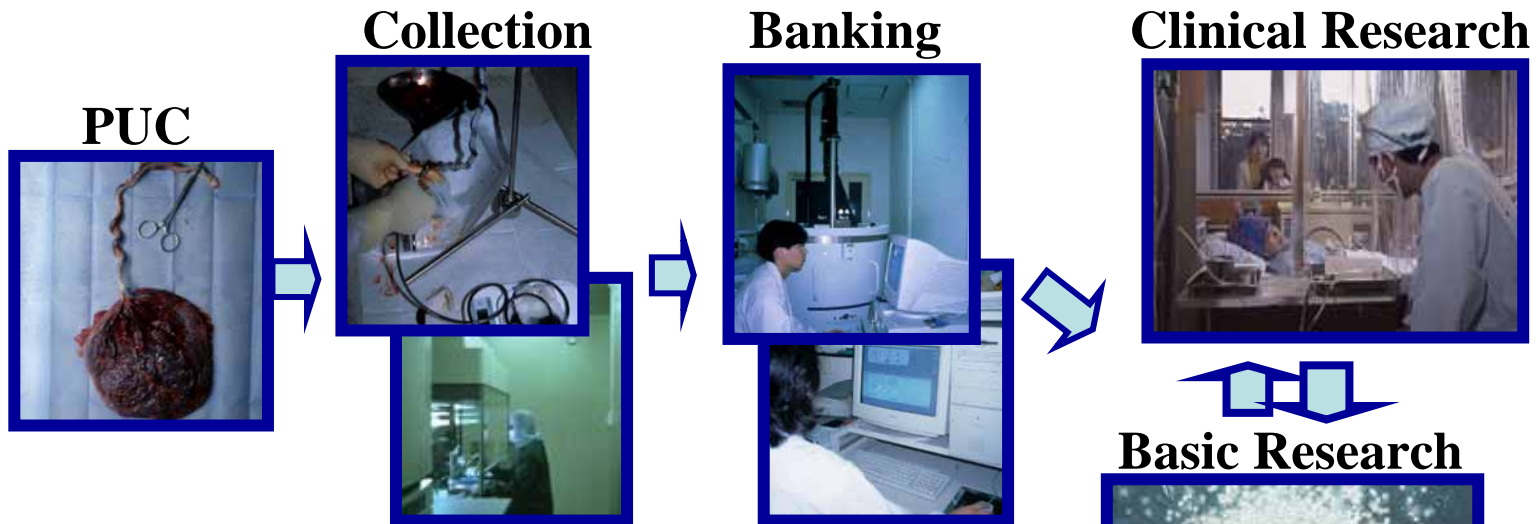
Co-operative Works

in Keeping the Public Cell Bank Activity



||

Such cooperation will provide a lot of chances for ethical, legal, and social implication researches and may contribute to establish a public intellectual base for advanced medicine.



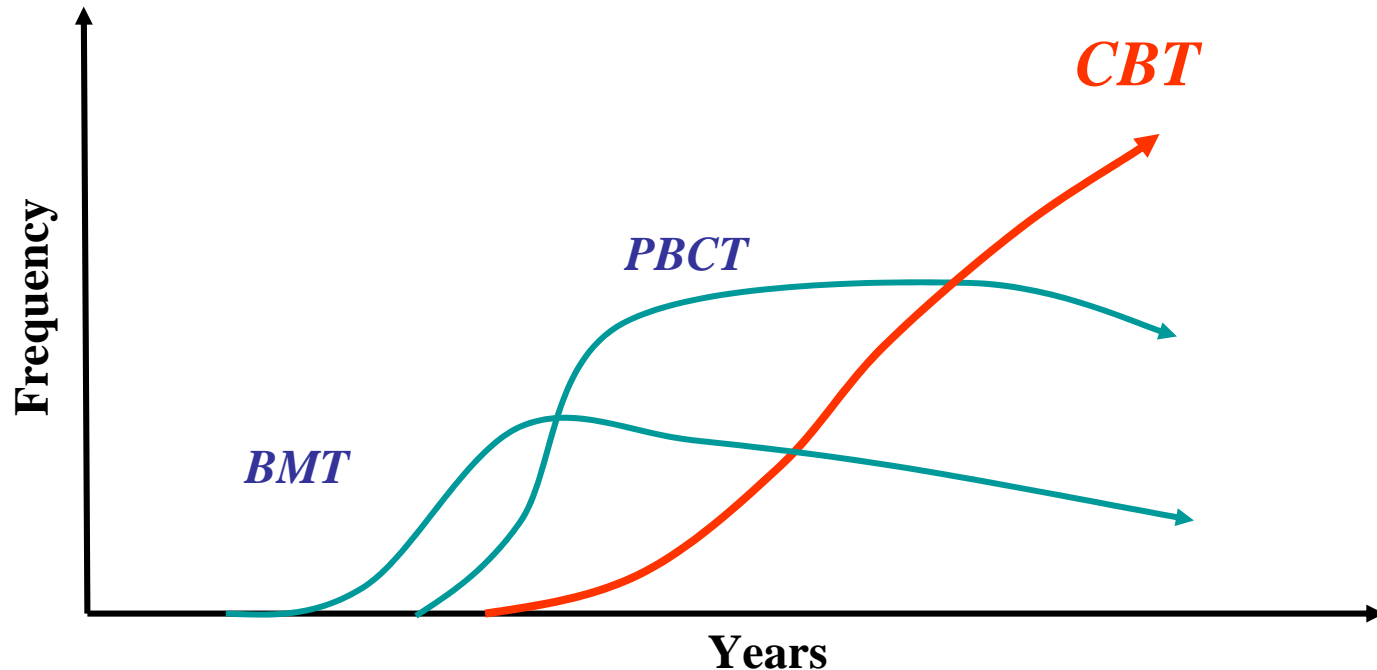
- ***How can the transmission of communicable diseases be prevented ?***
- ***What processing controls are necessary ?***
- ***How can clinical safety and effectiveness be assured ?***
- ***What labeling is necessary, and what kind of promotion is permissible, for proper use of the products ?***



*Potential Clinical Benefits
for Patients with Intractable Diseases*

Cord Blood Cell Transplantation

1. Lower GVHD incidence/high tolerance HLA mismatches (Acceptance of 1-2 antigen mismatched HLA units).
2. Large number of potential donors/ethnic balance
3. No risk to donors (mothers and infants) /easy harvest
4. Low prevalence of infections
5. Quick supply of cord blood units.

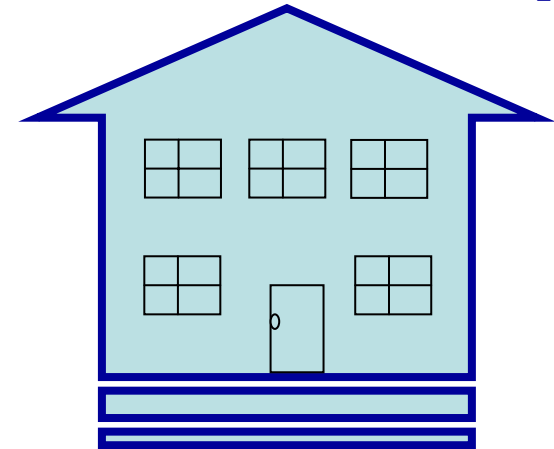


Biotechnology Revolutions

allowing:

- **Production of large quantities of growth factors**
- **Separation of specific cells**
- **Production of large numbers of human cells outside the body**
- **Modification of cell properties, e . g , by inserting genes into cells**

Cellular & Molecular Therapy



**Progress in Stem Cell Biology
and Genome Sciences**



*The next 10 years should be a very exciting period
in the development of this field.*

However, there remain scientific, clinical, and regulatory hurdles/problems to be overcome.

*Low cell recovery,
High cost and hard labor,
Lack of common methodology,
Low utilization rate,
Financial difficulties,
etc.*

➡ Our major issues have been on how to organize, to regulate, and to practice the on-demand exchange system, so that they can bring the full potential benefits of cell therapy to patients.

We believe that such an S&T program for Japan will lead to more international cooperative projects contributing to solutions for such global-scale problems as global warming, food security, energy shortage, fresh-water management, infectious-diseases prevention, and disaster prevention/reduction in order to realize a bright future for the 21st century.