

# **Evaluation Activities in JST Basic Research Programs**

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Innovation Headquarters,

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# **Evaluation Activities in JST Basic Research Programs**

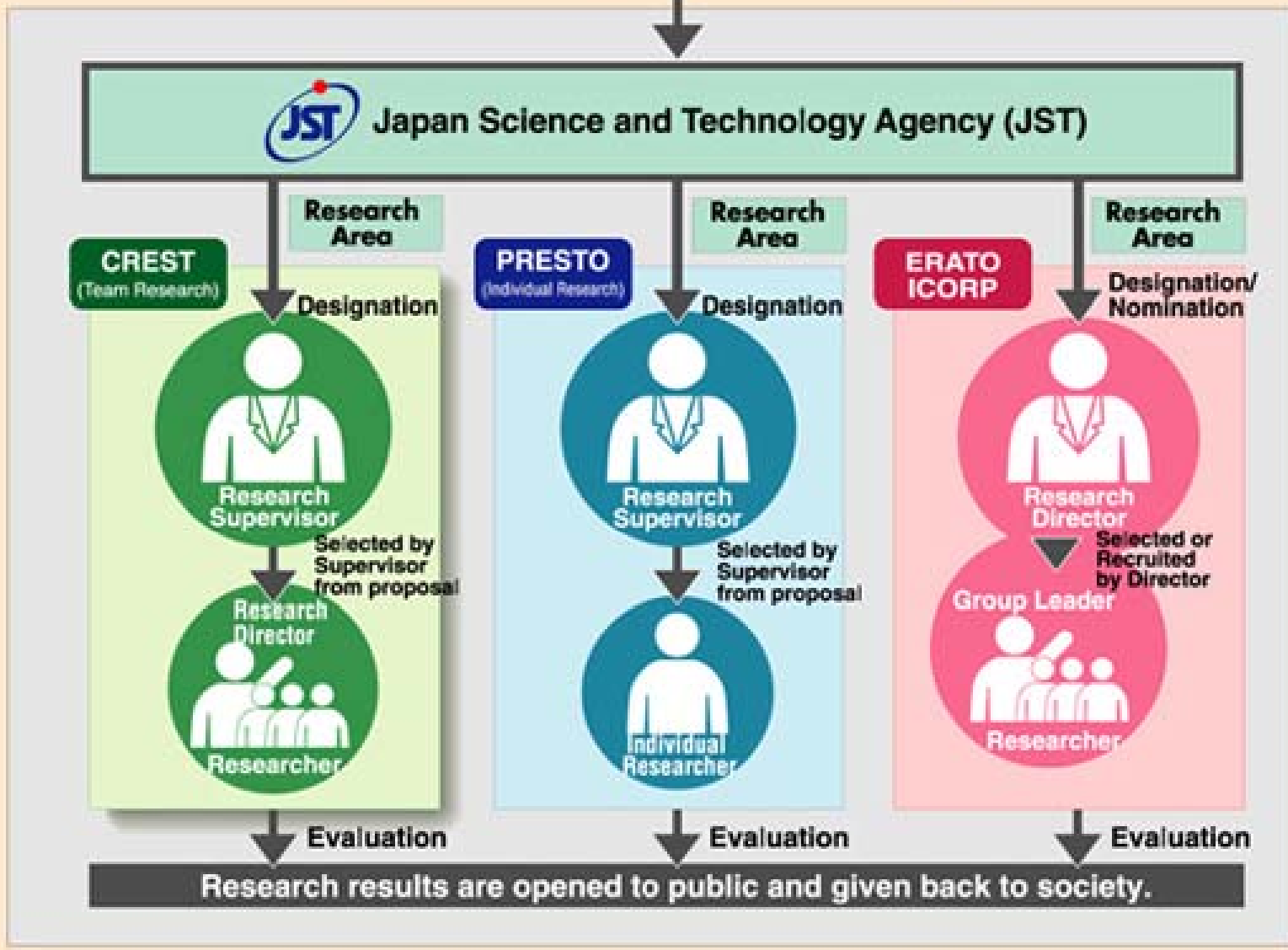
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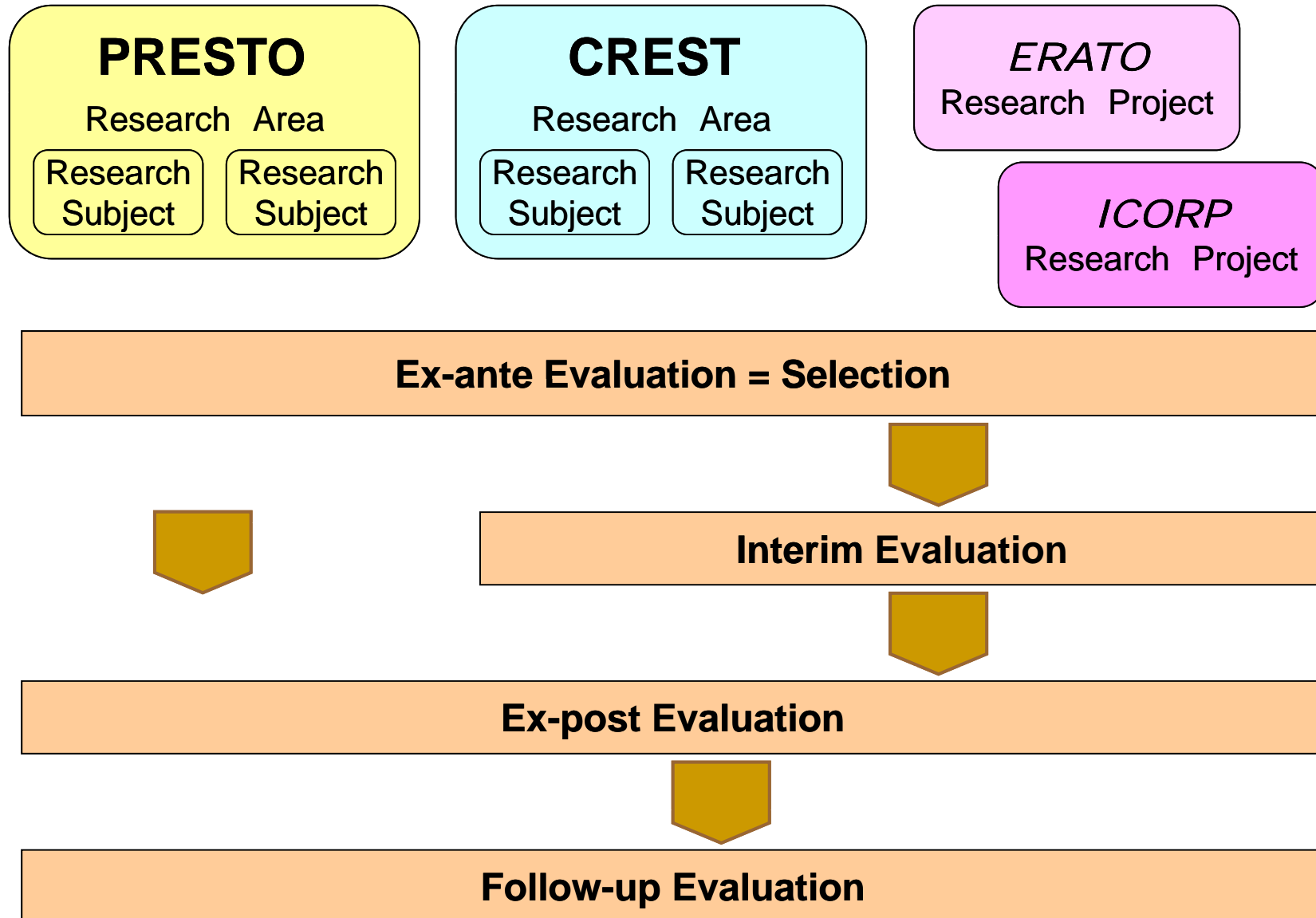
# **1. Evaluation Scheme in JST Basic Research Programs**

National Science and Technology Policies,  
Social and Economic Demands

Strategic Sector (Designated by MEXT)



# General Scheme in the Evaluation of the Programs



# Types of Evaluation in JST Basic Research Programs

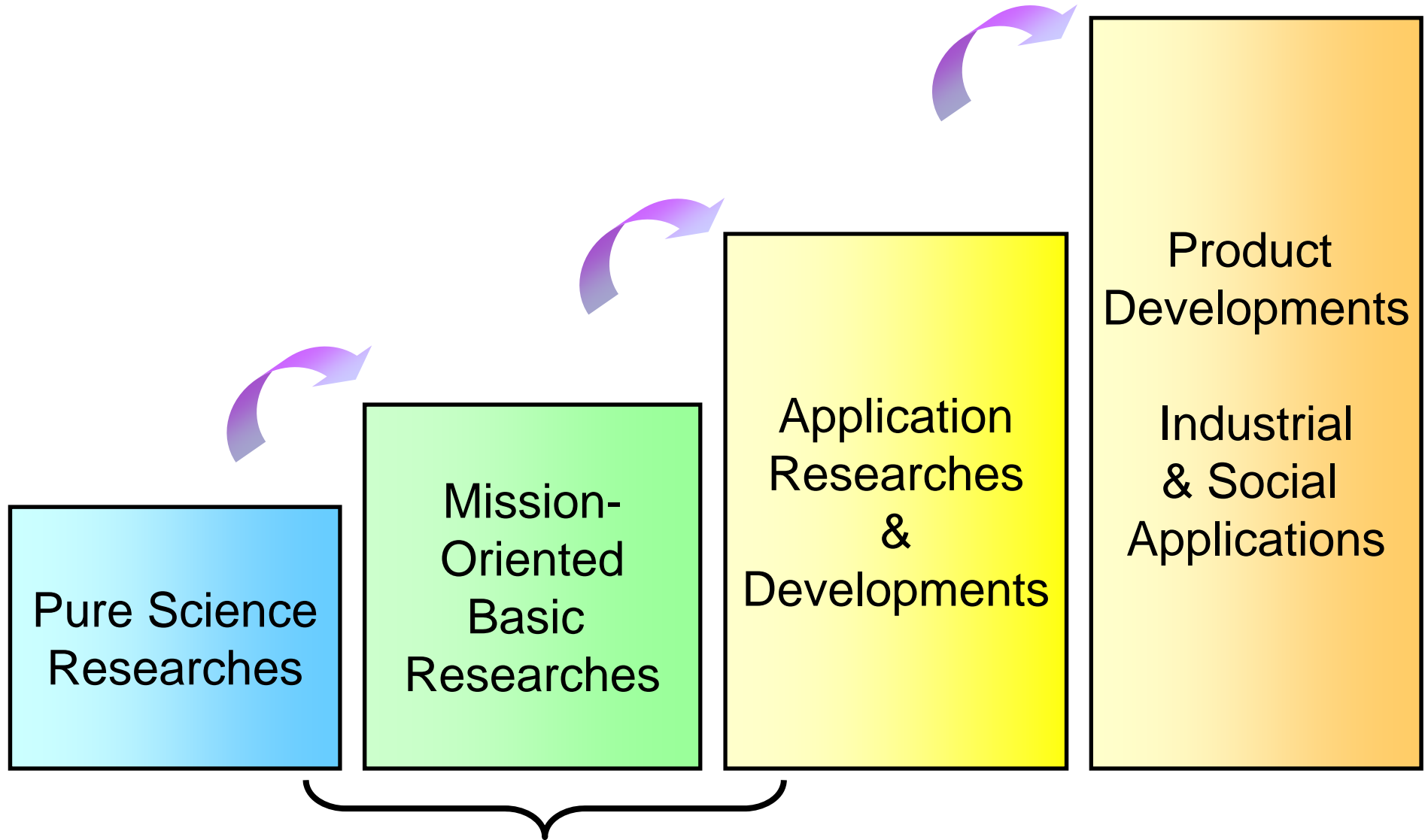
	<b>Evaluation type</b>	<b>Evaluator</b>	<b>Comment</b>
<b>Research Area</b> (5 to 8 years period)	Ex-ante	Program Director of JST	Based on the Strategic Sector designated by MEXT* (proposed from CRDS**)
	Interim	External Evaluation Committee	Typically in the 5th year of the 8 years Research Area period
	Ex post	External Evaluation Committee	At the end of the Research Area period
	Follow up	External Evaluation Committee	Typically 5 years later after the end of the Research Area period
<b>Research Subject</b> (3 or 5 years period)	Ex-ante	Research Supervisor (assisted by an evaluation panel)	Subjects for funding are selected
	Interim	Research Supervisor (assisted by an evaluation panel)	In the third year of the five years subject
	Ex-post	Research Supervisor (assisted by an evaluation panel)	At the end of the subject
	Follow up	External Evaluation Committee	Typically Five years later after the end of the Research Area period

\* MEXT = Ministry of Education, Culture, Sports and Science

\*\*CRDS = Center of Research and Development Strategy, JST

## **2. Evaluation Methodology in JST Basic Research Programs**

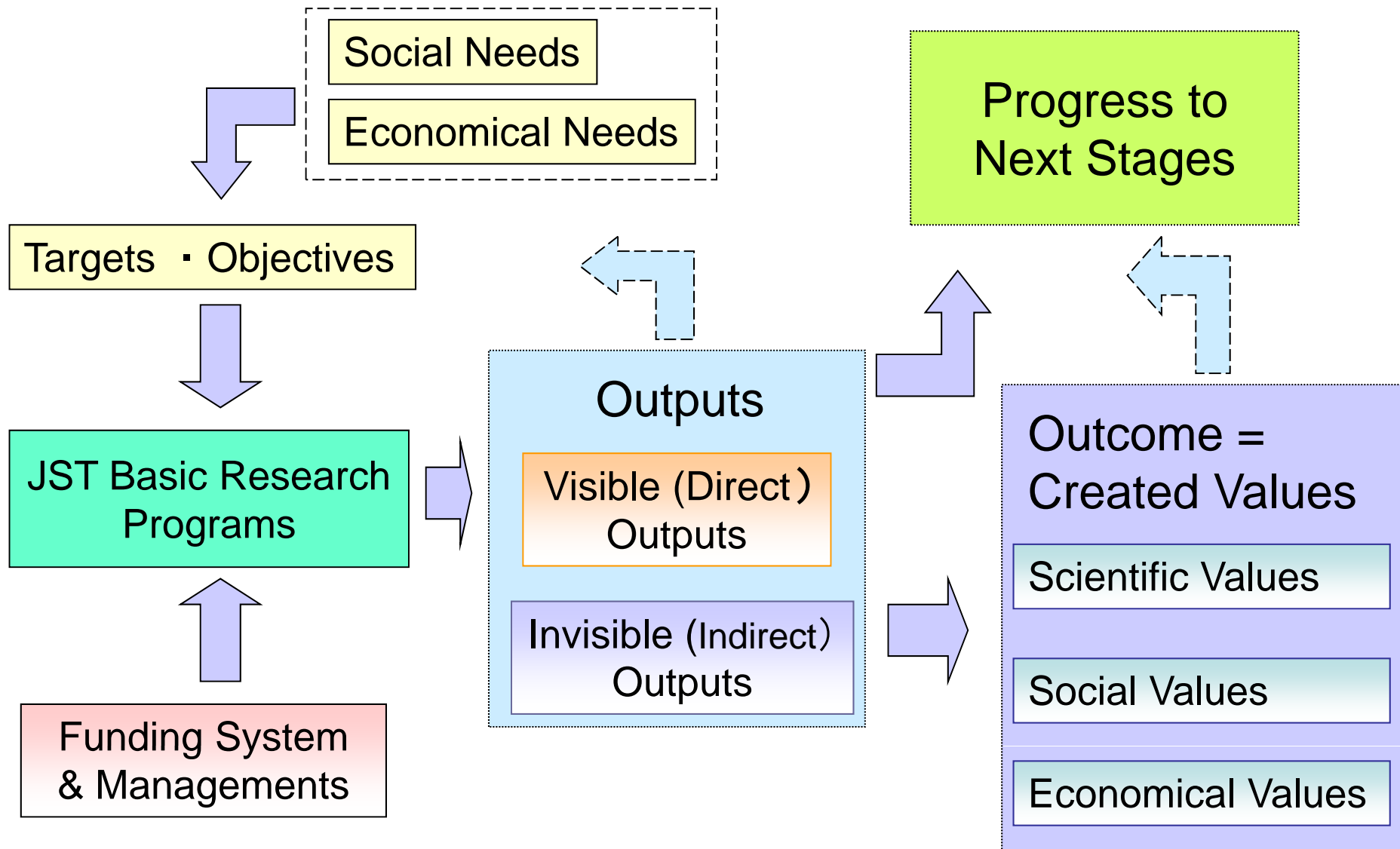
# JST Basic Research Programs in Innovative R & D Process



**JST Basic Research Programs**



# Viewpoints in the Evaluation of JST Basic Research Programs



# Evaluation Indices of “Outputs” from Mission-oriented Basic Research Programs

## Outputs

### Visible (Direct) Outputs

#### **Quantity of Outputs**

Published Papers, Applied Patents, etc

#### **Quality of Outputs**

Citations, Publications in High Impact-Factor Journals, Invited Lectures, Awards, Technology Transfer/License, Industrial/Social Applications, etc

### Invisible (Indirect) Outputs

Fostering of Researchers/Research Groups

Build-up of R & D Infrastructures

Build-up of S & T Potentials, etc

# Evaluation Indices of “Outcome” from Mission-oriented Basic Research Programs

Outcome = Created Values

## Scientific Values

Creation of New Concepts, New Fields, New Streams, New Technologies, New Methods, New Knowledge, etc

## Social Values

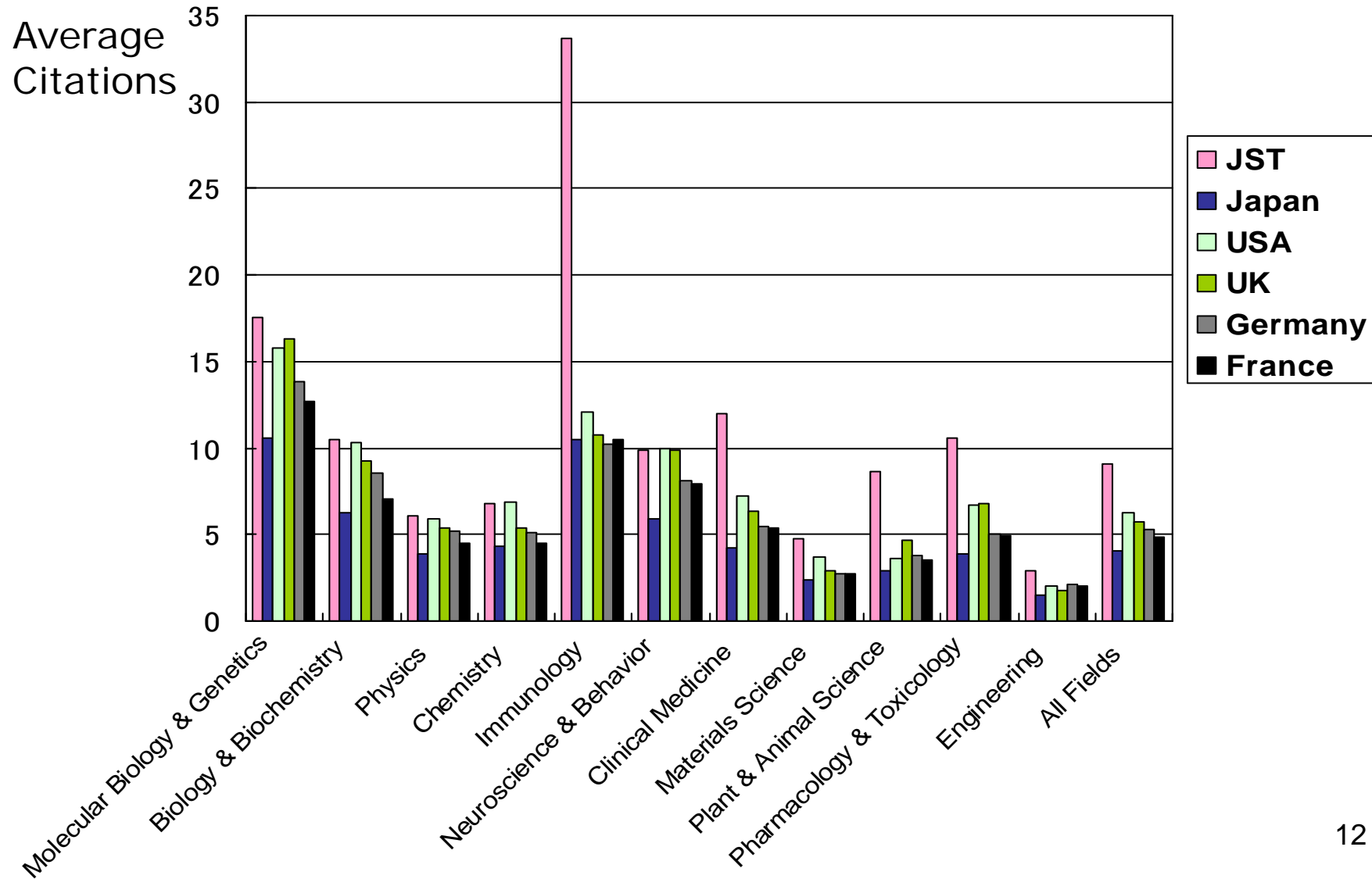
Contributions to Solve Problems in Environments, Social Systems, Peace & Safety, Quality of Life, etc

## Economical Values

Contributions to Create New Industries, New businesses, New Products, New Services, etc

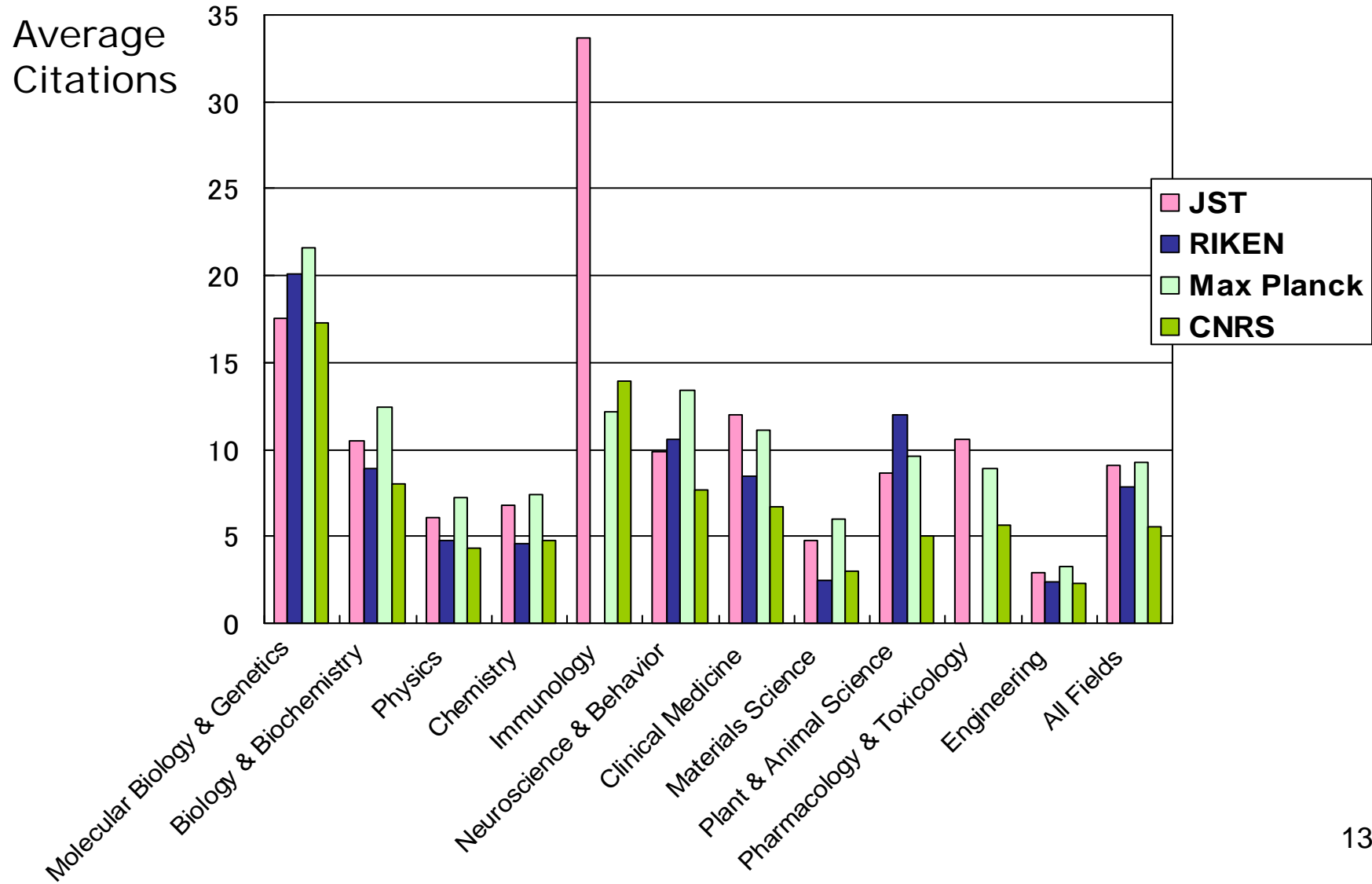
# Example to show “Quality of Outputs” of JST Programs ; Average Citations per Paper (for Different Countries)

Period: Jan.1, 2001 – Aug.31, 2005

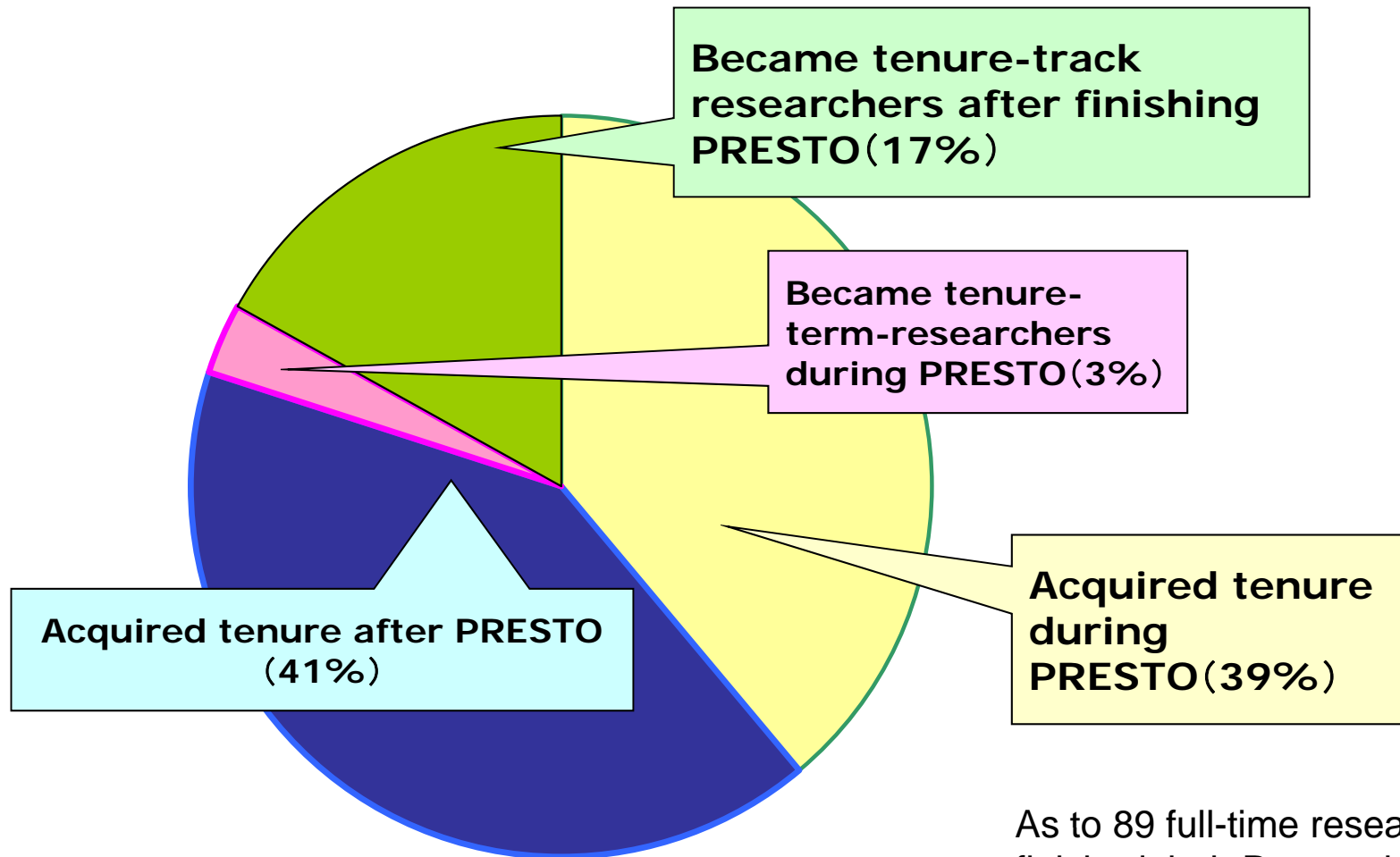


# Example to show “Quality of Outputs” of JST Programs ; Average Citations per Paper (for Different Institutes)

Period: Jan.1, 2001 – Aug.31, 2005



# Example to show “Invisible Outputs” of JST Programs ; Advancement of Positions of PRESTO Researchers

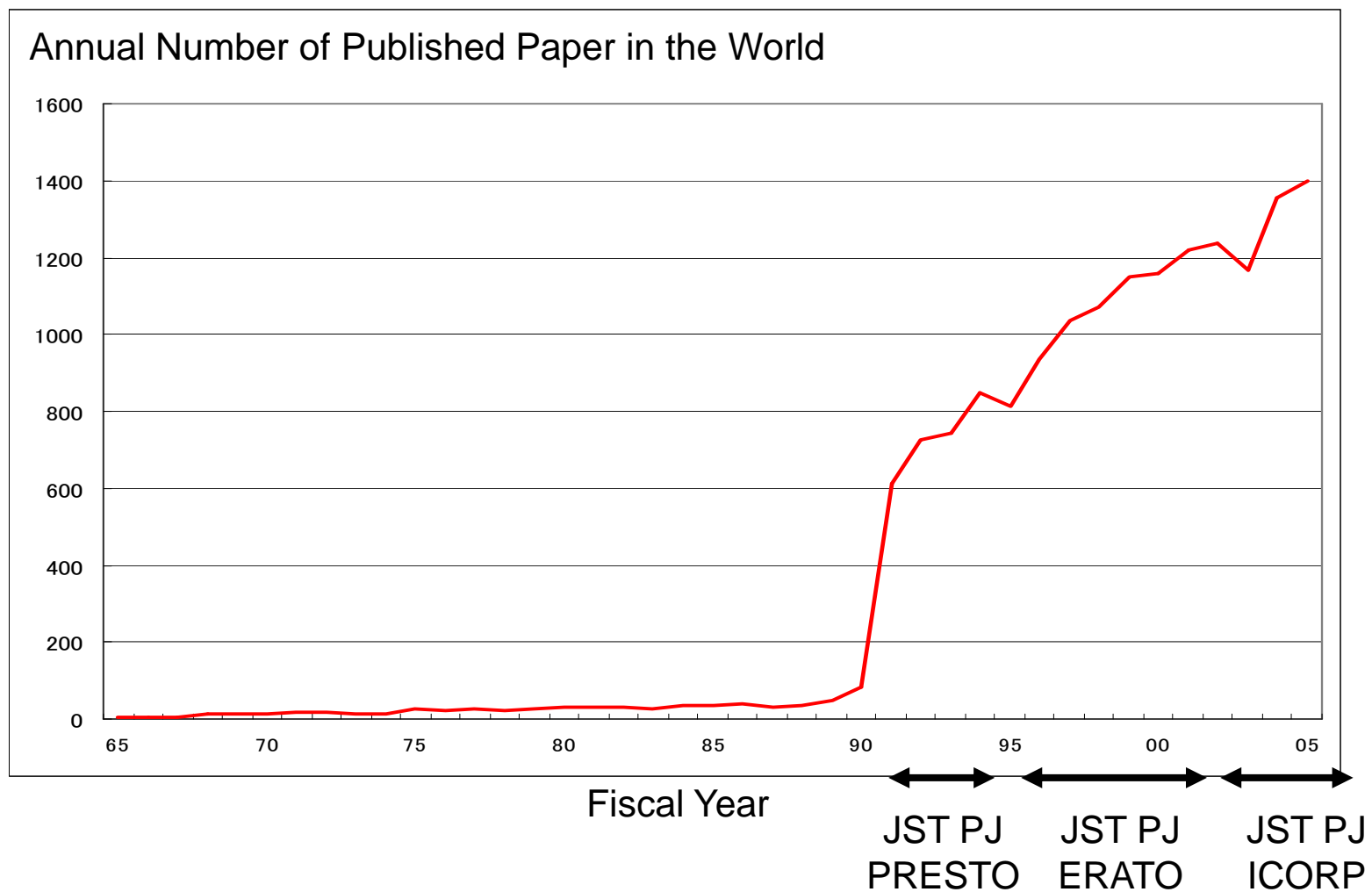


As to 89 full-time researchers who finished their Research by 2004

14

“Full-Time Researcher”; A researcher hired by JST as PRESTO researcher

# Example to show “Created Scientific Values” from JST Programs ; Total Number of Published Papers in the field of ”Chiral Photo-Chemistry”



JST Projects promoted the world-wide research activity in the “Chiral Photo-Chemistry” area

# Example to show “Created Scientific Values” of JST Programs ; Positions of the JST Researchers in the Best 20 Japanese Researchers ranked according to the citation of highly cited papers (Top 1%)

In the Field  
of Chemistry

Rankng	Citations	No. of Papers	Main Author		
			Name	Research Area of JST Program	Research Subject
1	5,497	35	NOYORI, Ryoji	ERATO「Noyori Molecular Catalysis」	
2	3,480	12	MIYAURA, Norio		
3	3,281	23	FUJITA, Makoto	CREST「Single Molecule and Atom Level Reaction」	Self-organizing Molecular Systems Utilizing Transition Metals
				CREST「Creation of Novel Nano-material/System Synthesized by Self-organization for Medical Use」	Development of Self-organizing Molecular Systems for Chemical Translation of Biological Functions
4	3,131	4	SUZUKI, Akira		
5	2,999	18	IKARIYA, Takao		
6	1,998	9	HASHIGUCHI, Syohei		
7	1,847	17	SHINKAI, Seiji	ERATO「Shinkai Chemirecognics」	
				ICORP「Chemotransfiguration」	
				SORST	
8	1,740	12	FUJISHIMA, Akira		
9	1,604	12	HASHIMOTO, Kazuhito		
10	1,567	12	TERASAKI, Osamu	CREST「Quantum Effects and Related Physical Phenomena」	New Arrayed Clusters in Microporous Materials: Syntheses, Structures and Physical Properties
11	1,564	12	YAMAGUCHI, Kentaro		
12	1,542	16	KITAGAWA, Susumu		
13	1,505	18	KOBAYASHI, Shu-	CREST「Single Molecule and Atom Level Reaction」	Development of New Reactions toward Efficient Synthesis of Structurally Distinct Molecules
				SORST	
14	1,418	10	USUKI, Arimitu		
15	1,279	7	FUJII, Akio		
16	1,196	7	ARIGA, Katsuhiko		
17	1,182	6	KUNITAKE, Toyoki	ERATO「Kunitake Molecular Architecture」	
				ICORP「Supermolecules」	
18	1,172	7	HARUTA, Masatake		
19	1,160	6	OKADA, Akane		
20	1,126	6	OGURA, Katsuyuki		

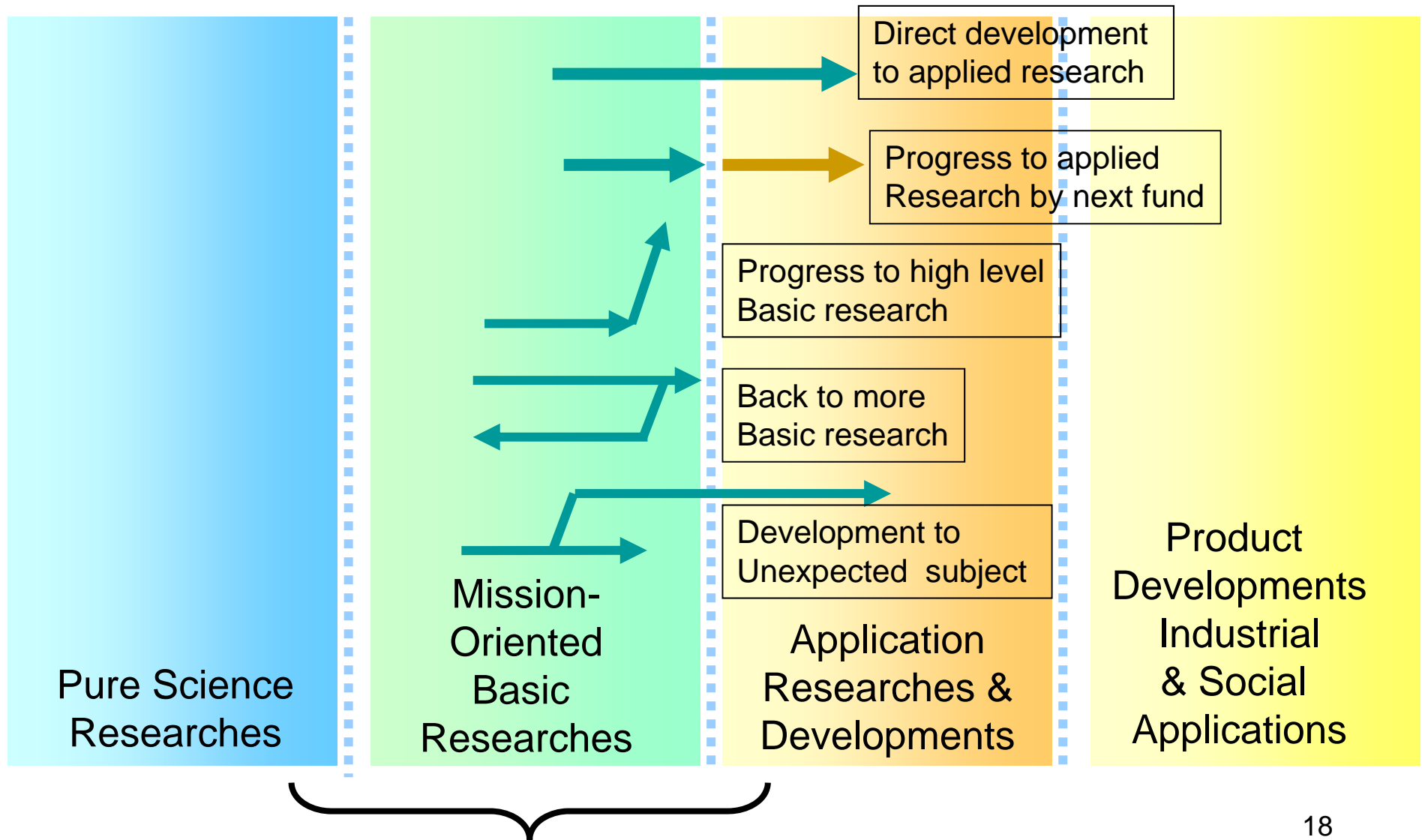


# Example to show “Created Scientific Values” of JST Programs ; Positions of the JST Researchers in the Best 20 Japanese Researchers ranked according to the citation of highly cited papers (Top 1%)

In the Field  
of  
Immunology

Ranking	Citations	No. of Papers	Main Author		
			Name	Research Area of JST Program	Research Subject
1	12,267	42	AKIRA, Shizuo	CREST「Host Defense Mechanism」 ERATO「Akira Innate Immunity」	Studies on Host Defense Mechanisms by Gene Targeting
2	9,436	26	TAKEDA, Kiyoshi		
3	5,002	13	HOSHINO, Katsuaki		
4	4,244	12	KAISHO, Tsuneyasu		
5	3,442	8	OKAMURA, Haruki		
6	3,253	9	NAKANISHI, Kenji	CREST「Translational Research for Intractable Immune Disorders and Infectious Diseases」	Therapeutic Approach to Innate Type Atopy by Focusing on IL-18
7	3,083	7	TSUTSUI, Hiroko		
8	2,966	10	SAKAGUCHI, Shimon	PRESTO「Cell and Information」 CREST「Translational Research for intractable Immune Disorders and Infectious Diseases」	Induction of Autoimmune Disease by Transgenic Manipulation of the Innate System—Establishment of a New Genetic Model of Autoimmune Disease A Novel Strategy of Immunoregulation with Regulatory T Cells
9	2,693	5	KURIMOTO, Masashi		
10	1,587	3	KISHIMOTO, Tadamitsu		
11	1,451	11	HONJO, Tasuku		
12	1,435	5	YOSHIMOTO, Tomohiro		
13	1,413	3	TODA, Masaaki		
14	1,392	3	YOSIE, Osamu		
15	1,272	3	KASHIWAMURA, Shinichiro		
16	1,228	3	TANIGUCHI, Masaru	CREST「Host Defense Mechanism」	Molecular Mechanism on Autoimmune Regulation
17	1,156	2	KOSEKI, Haruhiko		
18	1,134	3	NAGATA, Shigekazu	CREST「Structure and Function of Genomes」	Apoptosis and Genome
19	1,096	2	SUDA, Takashi		
20	1,092	4	INABA, Kayo		

# Types of “Progress to Next Stages” in JST Strategic Basic Research Programs



Progress of research subjects to next stage  
in CREST Research Areas finished in FY2007  
from the viewpoint of obtained fund after the project

Research Area #	Field of Research Area	Number of Research subjects	Number of Obtained basic R&D funds	Number of Obtained application R&D funds
A	Life Science/Biotechnology	14	56	48
B	Life Science/Biotechnology	17	33	95
C	Nanotechnology/Materials	10	22	27
D	Nanotechnology/Materials	11	39	40
E	Nanotechnology/Materials	8	11	31
F	Nanotechnology/Materials	9	13	32
G	Nanotechnology/Materials	14	23	44
H	Nanotechnology/Materials	10	10	20
I	Nanotechnology/Materials	10	17	38
J	Nanotechnology/Materials	11	11	31
K	Nanotechnology/Materials	10	15	58

# Evaluation Methodology: SUMMARY

1. Evaluation methodology of JST Basic Programs has been developed especially from the viewpoint of mission-oriented basic researches. Highly systematic evaluations with data of wide viewpoints are indispensable. The outputs and outcomes from the programs are essential factors.
2. In the evaluation of the research outputs, both direct/visible outputs and indirect/invisible outputs have to be considered. As the direct/visible outputs, their quality have to be stressed rather than their quantity. Typical evaluation indices for the former are the citation of published papers. Fostering of young researchers, build-up of research potentials, etc, are typical indirect/invisible outputs.
3. In place of the widely utilized concept of “Outcome”, “Created values” have been utilized as the evaluation indices for the basic research programs which are at far earlier stages before the industrial or social applications. “Created scientific values” obtained from the programs are typically shown from the fact that many research directors or researchers supported by the programs are playing roles as leaders of each research area in Japan.
4. Progresses of researches to the next stages are important indices for the evaluation, which are effectively shown as obtained funds after the projects.

### **3. International Advisory Committee for the Evaluation of JST Basic Research Programs**

# International Advisory Committee for the Evaluation of JST Basic Research Programs

Task of International Advisory Committee:

- General Review of JST Basic Research Programs

## View Point of Review of the Programs

1. Evaluation of the Funding System Performance
2. Evaluation of the Produced Values from the Programs
3. Evaluation of the Outputs from the Programs
4. Evaluation of the Contribution to the Research Potentials

● Last time: Held on January 25 to 27, 2006 in Tokyo  
(○ Next time: To be held in early 2011)

# **Review Report by the International Advisory Committee (January, 2006) Major Comments**

- 1. As the overall view, the programs have particularly promoted and enhanced basic research activities in Japan.**
- 2. Scientific outcomes from the programs are excellent and among the best in the world with high visibility in academia.**
- 3. Innovative outcomes are, however, not very positively evaluated. Greater efforts should be given to “basic research for innovation”, usually the weakest point common around the world.**
- 4. Selections of research areas and research directors with top-down policy are recommended to be continued, which were successful to pull up high-risk and outstanding research programs. More transparency may be, however, requested in the selection process.**
- 5. The funding system is uniquely designed and excellent as a Japanese funding system. The supporting mechanisms are excellent and very helpful to researchers. More flexibilities are, however, desirable in research managements, especially at the end of excellent research subjects.**

THANK YOU VERY MUCH FOR YOUR KIND ATTENTION