ERATO

ERATO

Exploratory Research for Advanced Technology

Department of Research Project
Innovation Headquarters

ERATO

Basic Research Programs

Program	Type of Promotion	# of Teams/ Researchers In a Research Area	Annual Research Expenses for a Team / a Researcher	Research Period	Annual Budgets (In total)
CREST (1996-)	Research Supervisor & Research Teams	10~15	0.3~0.5 M$ or 0.6~1 M$ (Not including indirect costs)	5 yrs	About 270 M$
PRESTO (1991-)	Research Supervisor & Individual Researchers	15~25	0.1~0.2 M$ (Not including indirect costs)	3 or 5 yrs	about 90 M$
ERATO (1981-)	Research Director & His/Her Operating Research Groups	Director: 1 Gr. Leader: 3~4 Post-docs: 10~15	< 3 M$ (Including indirect costs)	5 yrs	about 60 M$

ERATO: an Overview

- Launch in 1981
- Number of Projects (as of April 1, 2009)
  - On-going: 21 (Research Period: 5 years)
  - Finished: 77
  - Will be 100 in this autumn
- International Benchmarks / Reports, etc.
  - JTEC : 1988 and 1995
  - OECD: *Steering and funding of research institutions*
  - VINNOVA: *Mapping of research financing organizations in the US, China, and Japan* (2006)
- Novel Laureate
  - Dr. Ryoji Noyori: *for their work on chirally catalysed hydrogenation reactions, Novel Prize in Chemistry 2001*
  - ERATO Noyori Project: 1991-96

ERATO: Basic Concepts

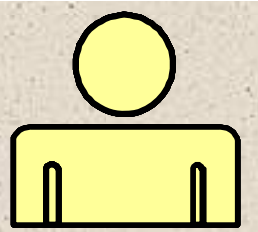
- Is an “Long-termed high-risk research”, which could
  - change the direction of thoughts in a discipline or
  - make a substantial discovery to break the new ground of science and technology.
- Is guided by the principles of “persons (not a project)”
  - His/her past accomplishments as a scientist is taken into consideration to some extent; *however*,
  - He/She should be a bold and ambitious pioneer with the potential to achieve quantum leaps.
- Provides new and special research opportunities
  - ERATO should never be the expansion of the on-going research.
  - Ultimate goal is to induce innovative changes not only in industries but also in economies and societies in 10-15 years.

Differences in *ex ante* evaluations

	PRESTO	CREST	ERATO
MEXT	Strategic Sector to JST		
JST	Designation of ☐ Research Area ☐ Research Supervisor ; a kind of Project Manager (PM)		Designation of ☐ Responsible Expert ; Responsible Person in *ex ante* Evaluation
Person(s) to be selected	Individual Researcher	Research Director	Research Director
Ex ante Evaluation	**Bottom-up system** 1. Submission of Research Proposal to Research Supervisor by Applicants 2. Document Review and Interview by Research Supervisor		**Top-down system** 1. Screening of Candidates (> 1,000) 2. 50 possible candidates 3. Submission of Research Proposals 4. Document Review and Interview

Bottom-up vs. Top-down

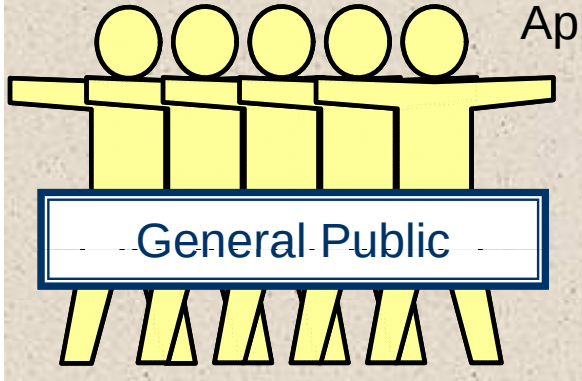
CREST & PRESTO ; Bottom-up Process



Research Supervisor

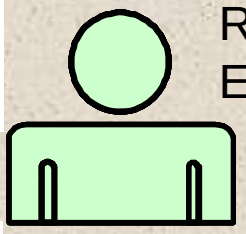
Submission of Proposals

Open to the public



Applicants

ERATO ; Top-down Process



Responsible Expert

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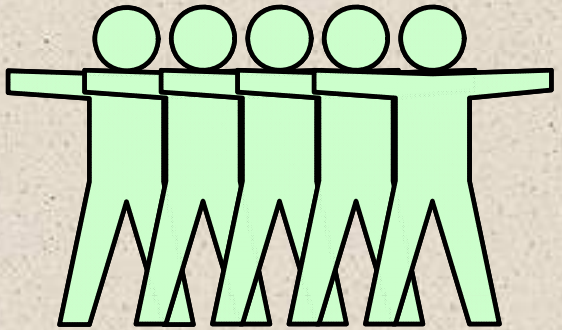
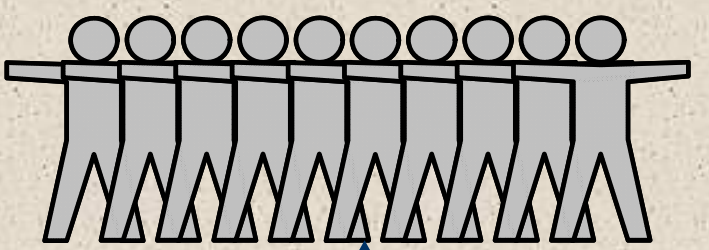
Request of Submission of Proposals



Candidates (#: ca. 10)



> 1,000

Nomination of candidates

Flow of *ex ante* evaluation in ERATO

Designation of responsible expert(s) — **1st-step** — **Making of list of candidates**

Selection of research area(s)/ discipline(s) to be promoted
- Portfolio based on on-going strategic sectors, etc.
- Discussion with JST's think-tank (CRDS)

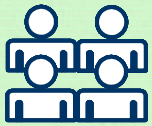
Deliberation by Program Director (PD)

Nomination of candidates from the general public

Surveys by think-tanks, etc.

Possible candidates (> 1,000)

Responsible Expert: 1



Advisors: 4~5
(at least one is invited from overseas)

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2nd-step

Screening of candidates (> 1,000 → ~10)

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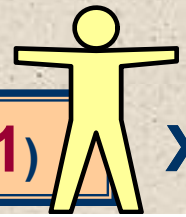
Request of submitting proposals to candidates written in English

New strategic sectors by MEXT

3rd-step

Submission of proposals written in English

Document review & interviews led by responsible expert (~10 → 1)



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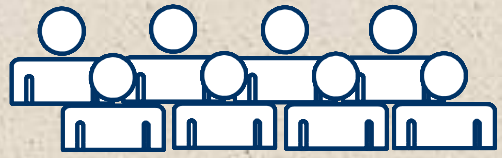
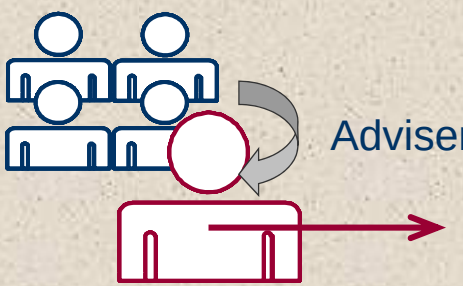
NOT for taking a “conservative” consensus

- “Negative” effect of peer-review system (Langfeldt, 2006)
  - Peer-review: “Democratic” decision-making process
  - Often has some conservative and risk-minimizing aspects
  - Disfavoring interdisciplinary and non-conventional researches

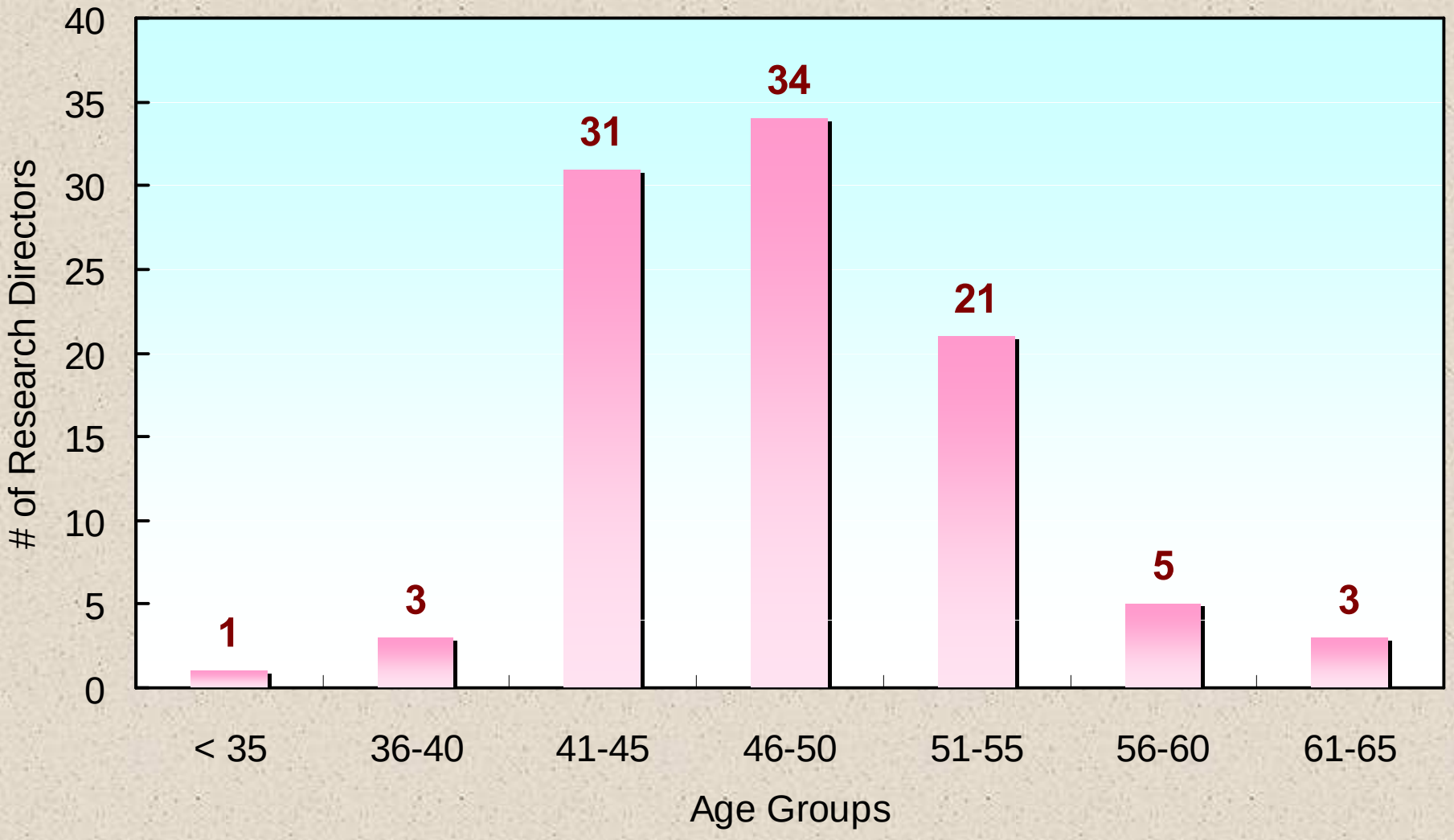


- Ex ante evaluation: discretional act of responsible expert
  - He/She can select ONLY ONE candidate with his/her own decision-making.
  - Just same as,
    - ✓ **NDPA, NIH**
    - ✓ **Research project in DARPA**

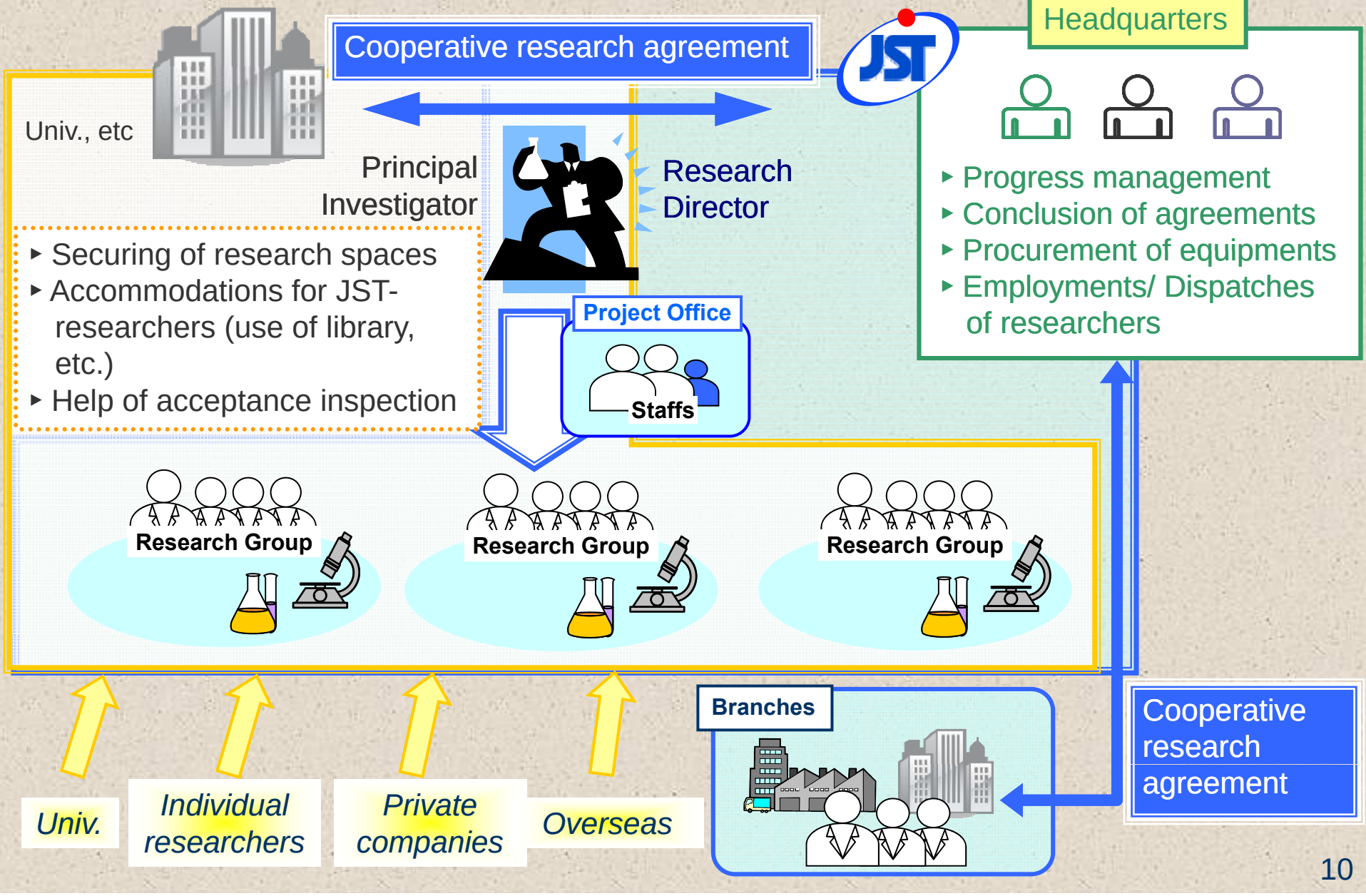


Age Distribution of *ERATO* Research Directors

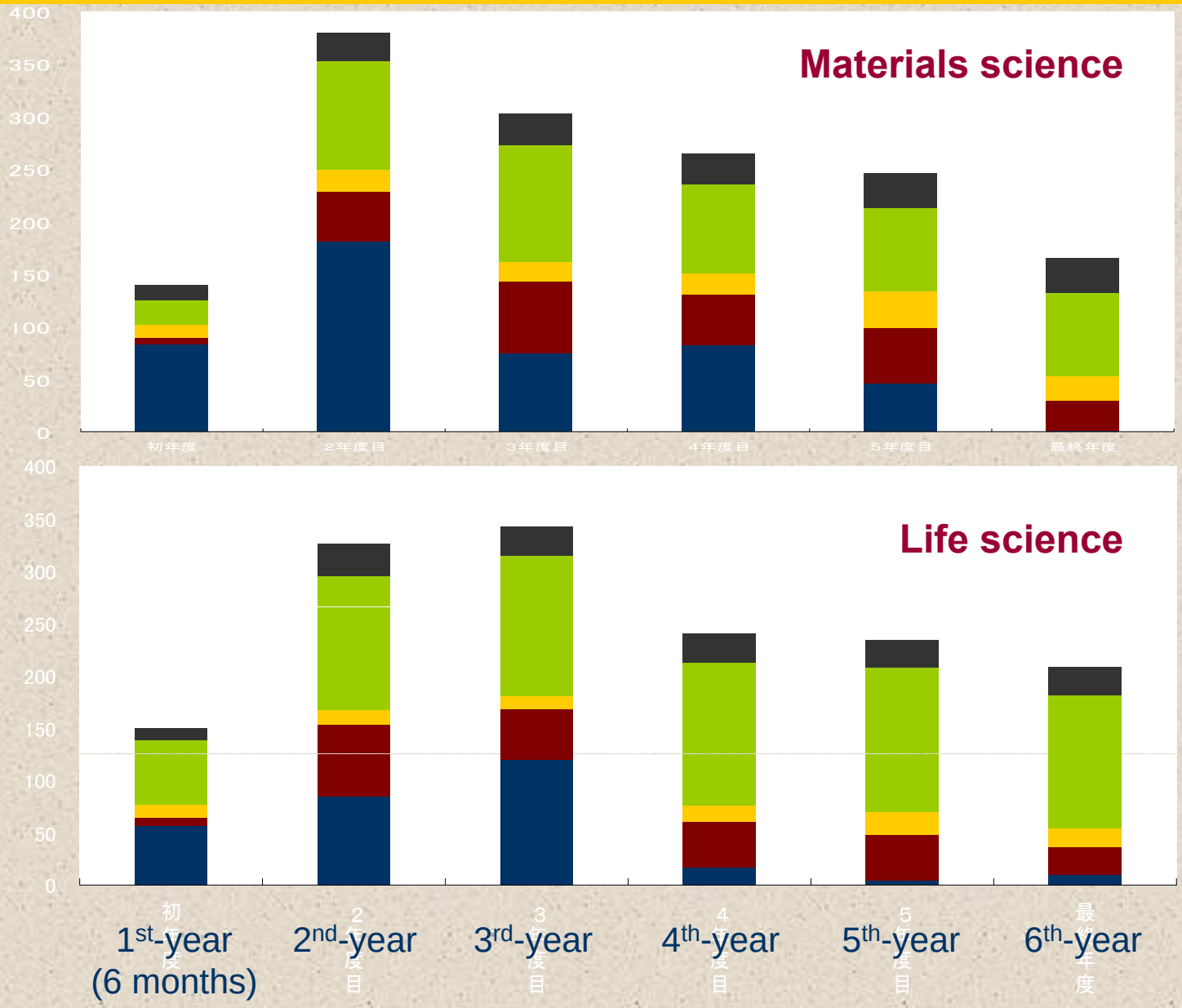
Total (1981-2008): 98
Average: 47.958



R&D management of ERATO project



Example of budget plan (Off-campus type)



- Equipments
- Consumables
- Miscellaneous expenses
- Salaries
- Rental costs

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On-going research projects

Projects	Research Director	Research Groups
Live Cell Chemistry (FY 08-13)	Mikiko Sodeoka RIKEN	Cell Death Control/ Live Cell Reaction/ Live Cell Analysis
Infection-Induced Host Responses	Yoshihiro Kawaoka Univ. Tokyo	Virology/Cell Biology / Host Cell Response/ Computational Systems Biology
Emotional Information	Kazuo Okanoya RIKEN	Emotion Integration/ Emotion Modeling/ Emotion Interface/ Emotion Development
Soft Interfaces	Atsushi Takahara Kyushu Univ.	Precise Molecular Design/ Soft Interface Structure Control/ Advanced Interface Characterization
Nuclear-spin Electronics (FY 07-12)	Yoshiro Hirayama Tohoku Univ.	Nuclear Spin Manipulation/ Nano NMR and nanoprobe/ Semiconductor characterization/ Physics Research and epitaxy
Design Interface	Takeo Igarashi Univ. Tokyo	Technologies for media authoring/ Technologies for designing everyday objects/ Technologies for programming home robots
Human-sensing Fusion	Kazusuke Maenaka Hyogo Pref. Univ.	Device/ Circuit/ Micro-power/ Software

On-going research projects

Projects	Research Director	Research Groups
Integrated Pores	Susumu Kitagawa Kyoto Univ.	Pruripotent Pores/ Hybrid Pores
Stem Cell and Organ Regeneration	Hiromitsu Nakauchi Univ. Tokyo	Small Animal Model/ Large Animal Model
Nano-liquid process (FY 06-11)	Tatsuya Shimoda JAIST	Theoretical Research/ Material Research/ PDE Research
Multiferroics	Yoshinori Tokura Univ. Tokyo	Multiferroics Materials/ Magnetoelectric Correlation/ Magnetoelectric Spectroscopy/ Multiferroics Theory
Live Function Dynamics	Atsushi Miyawaki RIKEN	In Vivo Live Imaging/ Mathematical Analysis/ Optical System Development
Light Energy Conversion	Kazuhito Hashimoto Univ. Tokyo	Organic Polymer/ Metal-complex Energy Conversion/ Microbial Conversion

Synergistic Intelligence (FY 05-10)	Minoru Asada Osaka Univ.	Physio-SI/ Perso-SI/ Socio-SI/ SI-mechanism
Macroscopic Quantum Control	Masahito Ueda Univ. Tokyo	Ultracold Molecules/ Quantum Information/ Strongly Correlated Quantum Gases/ Theory
Human Receptor Crystallography	So Iwata Imperial College	Receptor Preparation/ Crystallization/ Crystallizing Ligand Design/ Data Collection System Development
Reprogramming Evolution	Mitsuyasu Hasebe Nat. Inst. Basic Biology	Omics/ Infomatics Reverse Genetics/ Bioimaging
Complex Systems Biology (FY 04-09)	Kunihiko Kaneko Univ. Tokyo	Dynamics-Theory/ Dynamics-Experiment/ Constructive Biology-Theory/ Constructive Biology-Experiment
Functional Carbon Cluster	Eiichi Nakamura Univ. Tokyo	Functional Complex/ Device Design/ Nano Characterization
Implicit Brain Function	Shinsuke Shimojo Caltech	Decision Making/ Implicit Auditory/ Implicit Sensory Motor Control/ Neurobiology of Addictive Behavior
Nuclear Complex	Shigeaki Kato Univ. Tokyo	Complex Identification/ Nuclear Signaling Cross-talk/ In Vivo Function

ERATO researchers

Accumulating total from 1981 to 2005 Mar.