

Comments

Japan's View on Risk Governance of Nanotechnology

Kazunobu Tanaka

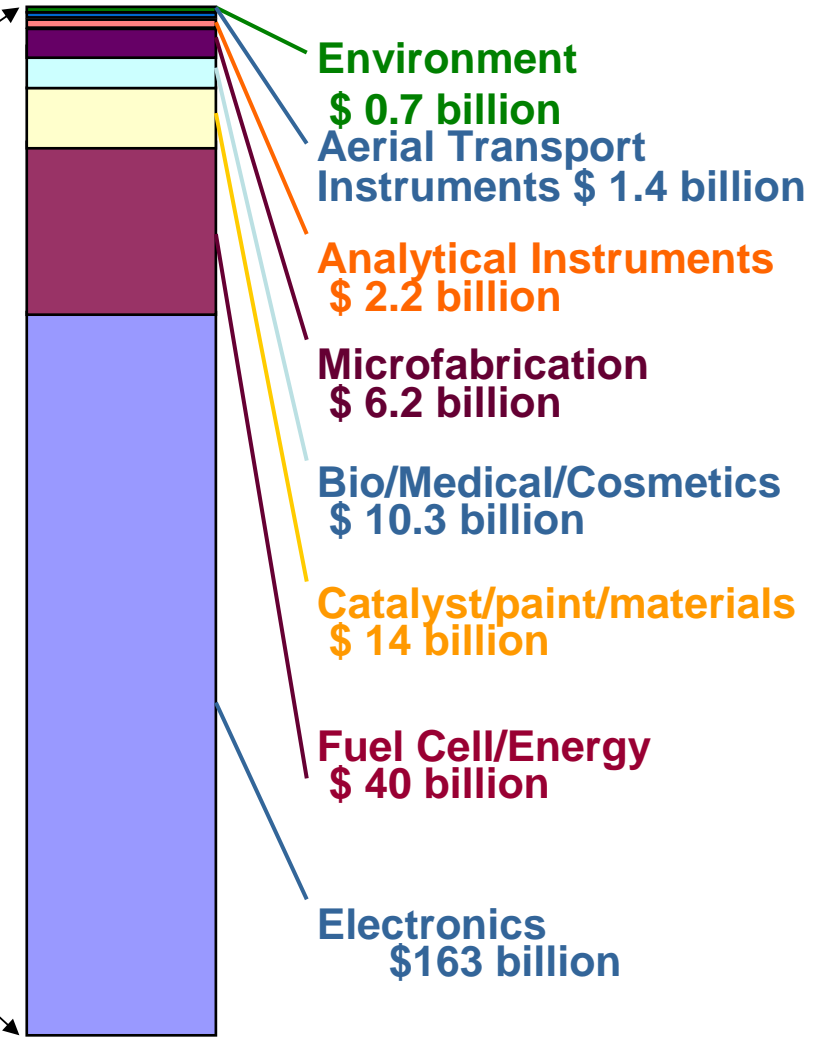
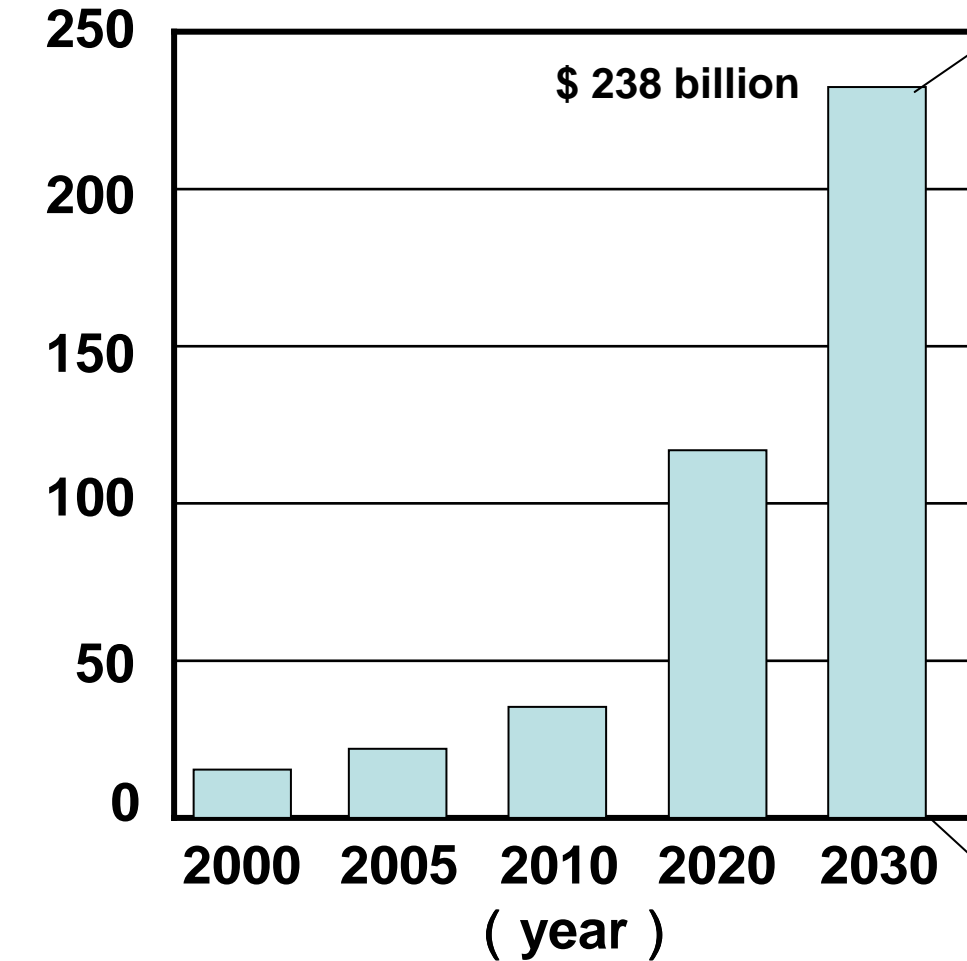
**National Institute of
Advanced Industrial Science and Technology (AIST)
Center for R&D Strategy (CRDS), JST**

***IRGC Conference on
'The Risk Governance of Nanotechnology:
Recommendations for managing a Global Issue'
Swiss Re Center for Global Dialogue, Ruschlikon, July 6&7 2006***

Nanotechnology Market Expectation

Expected Nanotechnology Market by Business Category in 2030

(Billion \$)
 \ 110 = \$ 1

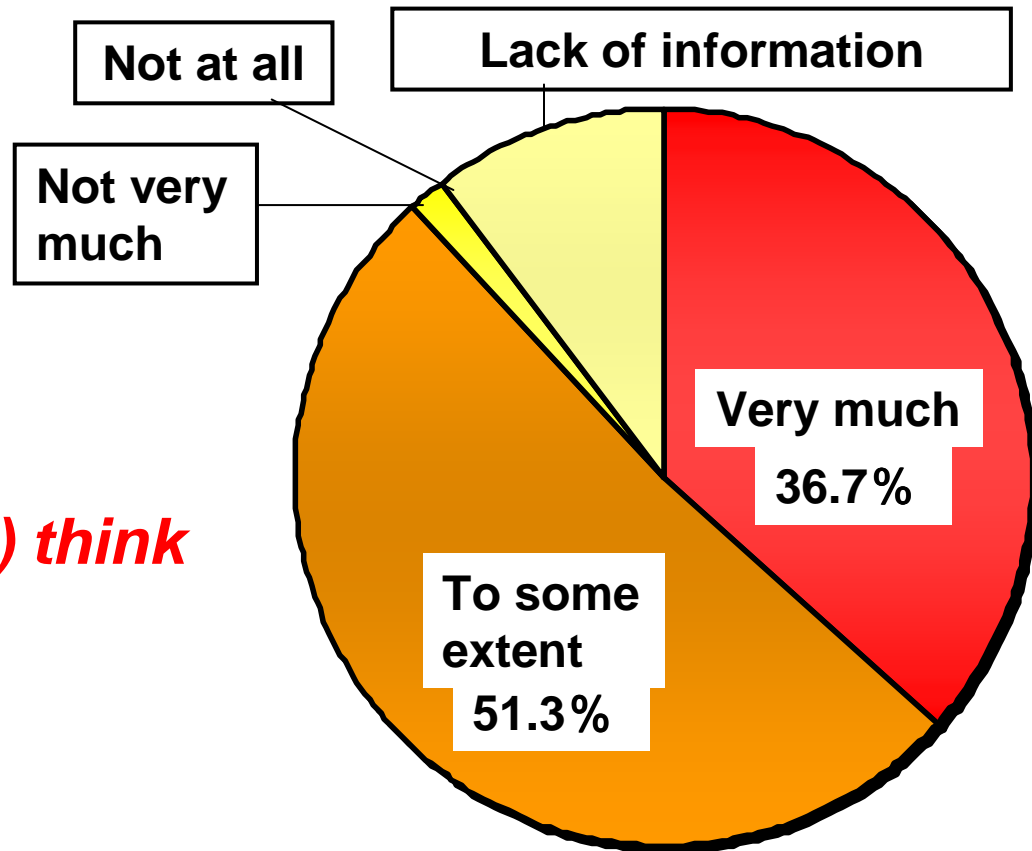


The Nikkan-Kogyo Shinbun (2006.5.9)

Source data; Ministry of Economy, Trade and Industry (METI)

High expectancy

Question: “Do you think nanotechnology is useful for the society?”

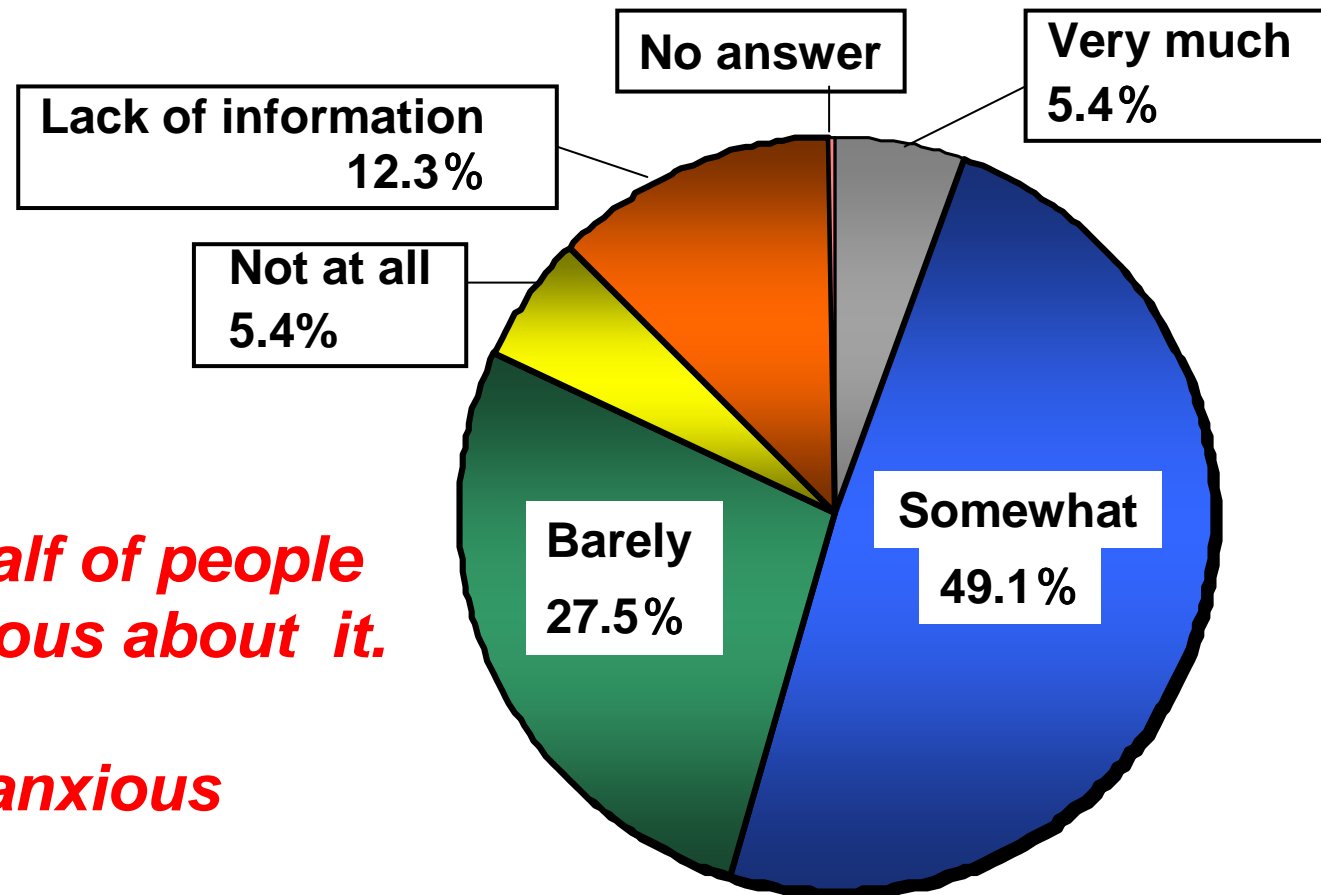


Most people (88.0%) think it is useful.

Source: Questionnaire Survey Report on Nanotechnology and Society (Y. Fujita and S. Abe, AIST-NRI, 2005, in Japanese)

Some worry

Question: “Do you feel anxious about the development of nanotechnology?”



More than half of people (54.5%) anxious about it.

32.9% : not anxious

Source: Questionnaire Survey Report on Nanotechnology and Society (Y. Fujita and S. Abe, AIST-NRI, 2005, in Japanese)

People's Concern about Nanotechnology in Japan

Most of information on harmful effect of nanotechnology is mainly provided by Europe or United States.

Potential danger to EHS of unintended discharge of nanoparticles is reported by the media in connection with

Health hazard occurred by asbestos

Diesel Exhaust Particles (DEPs)

People's concern on the effect of fine particles on EHS is very high.

Nation-wide regulation on DEPs against air pollution since 2001

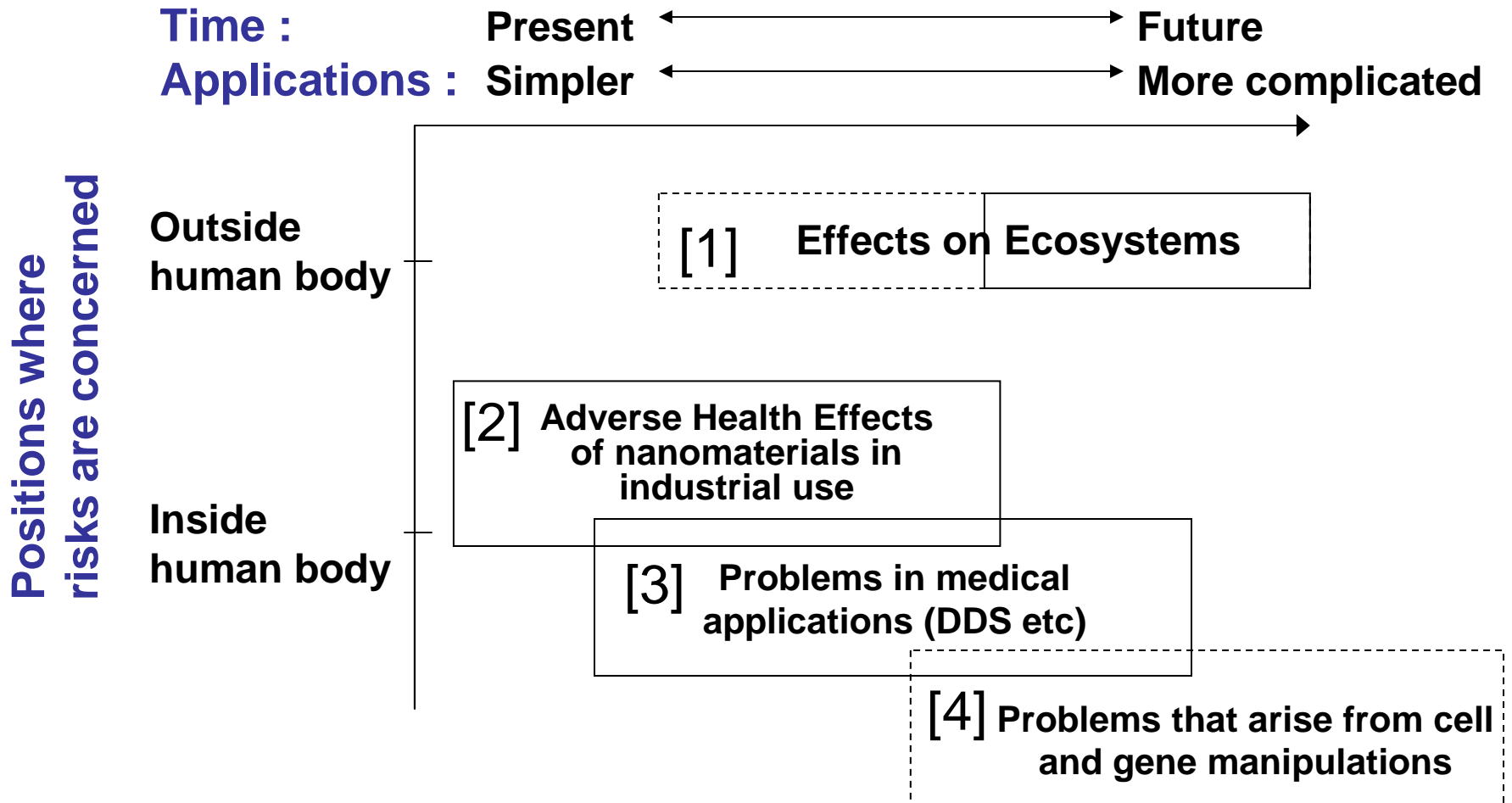
Details of damage caused by previous exposure to asbestos used heavily in 1960's -1970's came out recently as Mesothelioma.

Two kinds of concerns about nanotechnology in Japan

Anxiety about health effect of fine particles

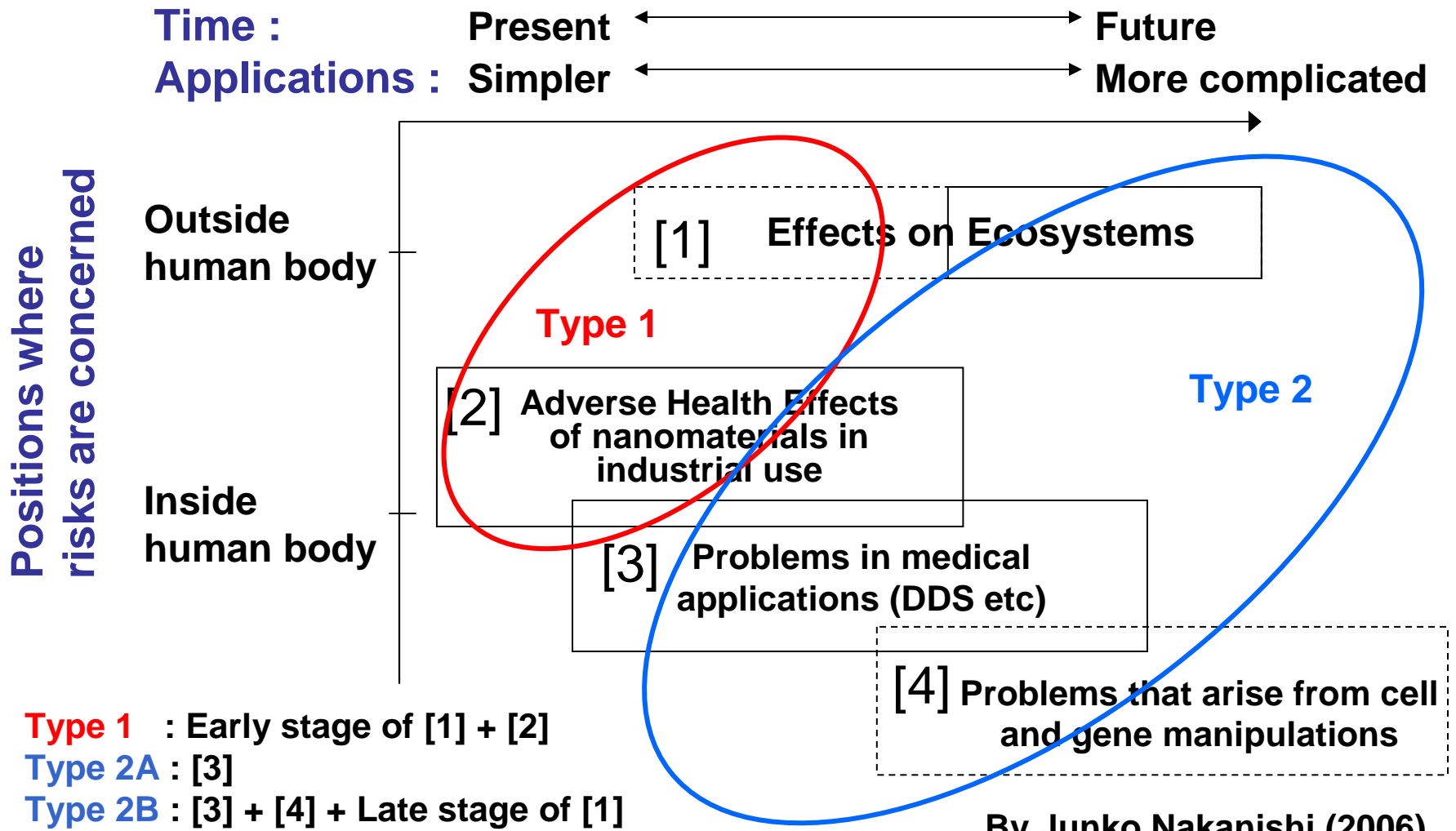
Anxiety for unknown nature of new technology

Categories of Risks Potentially Triggered by Applications of Nanotechnologies



By Junko Nakanishi (2006)

Categories of Risks Potentially Triggered by Applications of Nanotechnologies



By Junko Nakanishi (2006)

Approach to Each Type of Risk

		Category in Fig.6	Approach	Remarks
Type 1		Early stage of [1] : Simple Ecological Risk	Information gathering	Serious effects are not anticipated for a while.
		[2] : Adverse Health Effects of Nanomaterials in Industrial Use□	Rigorous application of risk assessment framework and risk communication	Uncertainty due to Nano-specific properties should be addressed by scientific inference.
Type 2	A	A part of [3] : A part of medical applications such as DNA tip, DDS, and artificial blood cell	Addressed by the examination systems for medicines and medical devices	Consideration of ethical aspects is required.
	B	[4] : such as tissue and cell engineering A part of [3] : such as nano-machines (incl. a kind of DDS)	Development of social system considering the worst case.	Ethical aspects should be addressed.
		Late stage of [1] : Complicated Ecological Risk		Addressed as a global environmental problem

By Junko Nakanishi (2006)

Events and Projects of Responsible R&D of Nanotechnology in Japan since 2004

Open monthly forum " Nanotechnology and Society " Aug. 2004 - Mar.2005 / AIST

Inter- Ministry Symposium " Nanotechnology and Society " Feb.1 , 2005. / AIST, NIMS, NIES, NIHS, NBCI, Nikkei

Uk-Japan Dialogues on EHS issues of NT / 2005 – 2006

METI project " Standardization of Nanoparticle Risk Evaluation Method " 2005-07 / AIST

MEXT project "Facilitation of Public Acceptance of Nanotechnology " FY 2005

The Second International Dialogue on Responsible R&D of Nanotechnology , 26-28 June 2006 @ Gakushi-Kaikan, Tokyo

The 3rd Science and Technology Basic Plan, Japan FY2006 – 2010 / CSTP, Cabinet Office

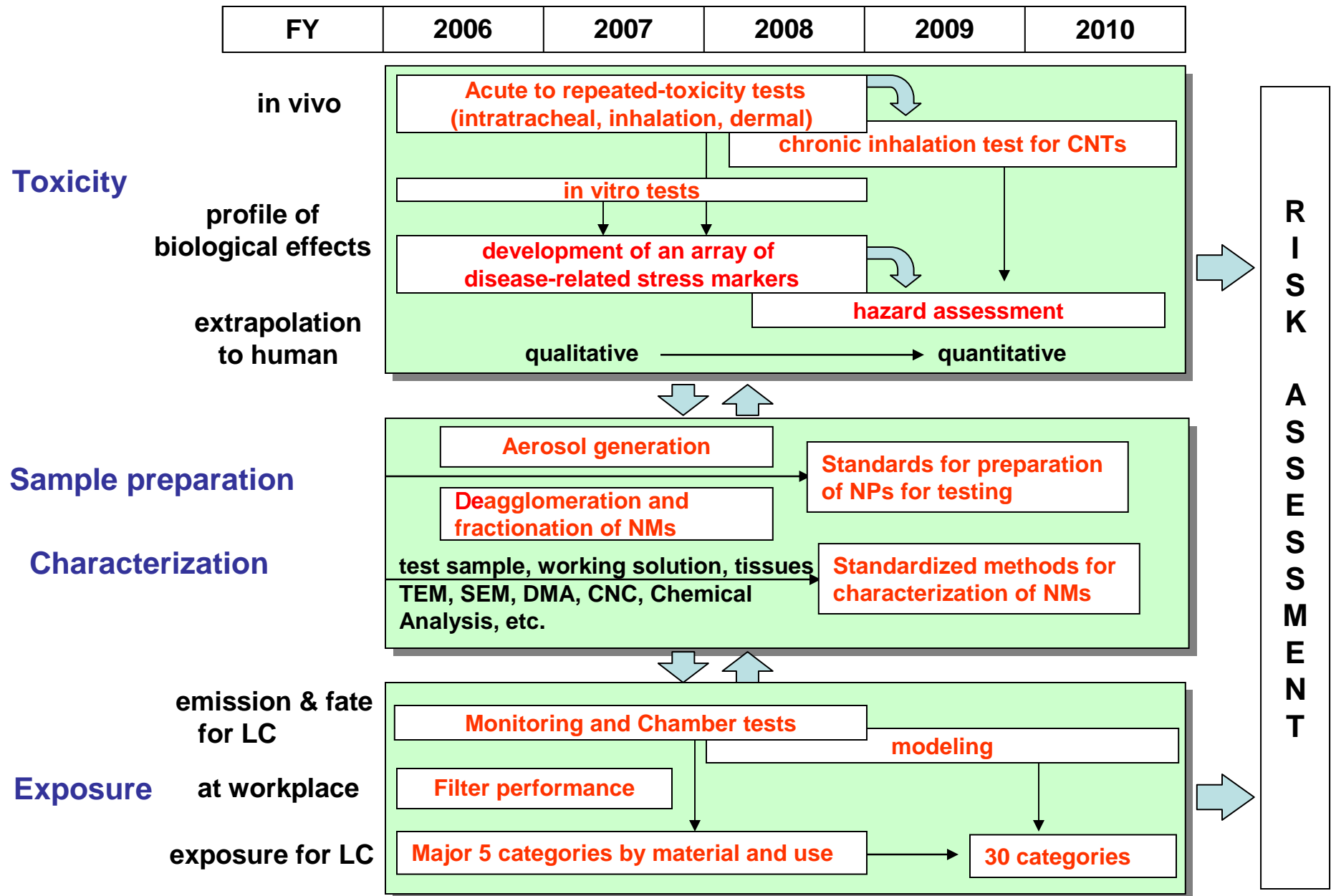
**NEDO project "Risk Assessment & Management of Manufactured Nanomaterials" 2006-10 / AIST , Univs , Industry / US\$ 20M
Project Leader : Junko Nakanishi (AIST)**

Roadmap of Risk Assessment

Roadmap of Risk Assessment

(remade in the form of Nakanishi 2005)

NMs: nanomaterials



Policy Recommendations from “Research Project on Facilitation of Public Acceptance of Nanotechnology”

Funded by Fiscal 2005 “Special Coordination Funds for Promoting Science and Technology” (Japan Ministry of Education, Culture, Sports, Science and Technology)

Four Japanese public research institutes^[1] played a core role in implementing the research project entitled “Facilitation of Public Acceptance of Nanotechnology” under the financial support of the “Special Coordination Funds for Promoting Science and Technology” of Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT). The project was carried out with a broad level of cooperation from many parties, including universities, the private sector, and non-governmental organizations, etc. Research was carried out through five working groups, each of which prepared a report of its findings. This document’s aim is to provide a concise summary of the project’s findings for a wide audience. Based on each working group’s outcomes, it identifies key issues that public research institutes, the private sector, and the Government need to tackle regarding the societal impacts of nanotechnologies, and ends with summary of policy recommendations.



^[1] National Institute of Advanced Industrial Science and Technology (AIST), National Institute for Environmental Studies (NIES), National Institute of Health Sciences (NIHS), National Institute for Materials Science (NIMS)

The 2nd International Dialogue on Responsible Research and Development of Nanotechnology

26 – 28 June 2006 @ Gakushi-Kaikan Tokyo

Organized by Dr. Hiroyuki Abe (CSTP), Dr. Hiroyuki Yoshikawa (AIST), and Dr. Teruo Kishi (NIMS)
Moderated by Dr. Kazunobu Tanaka (JST, AIST)

88 Participants from 21 Economies and EC (Policy Maker, Academia, Expert, Private Sector, etc.)

Breakout Discussion on;

- 1, EHS (Dr. B. Karn)
- 2, ELSI (Dr. A. Rip)
- 3, Education and Capacity Building (Dr. T.-K. Lee)
- 4, Developing Countries Issues (Dr. T. Pornsinsirak)
- 5, Standard Setting (Dr. P. Hatto)



Introductory session in the morning of 27th.



Banquet in the evening of 27th.

Full report is in preparation

Comments on IRGC Recommendations (1)

Does the separation of potential risks into two frames of reference provide a viable and useful reflection of the current situation?

Yes, it does. The proposed approach to categorize risks into two groups seems to be relevant, although some issues related with passive nanostructures should be examined in the Frame-2 procedure.

Do you have any suggestions for improvement?

Considering the current situation that medical application of nanotechnology frequently envisions the enhancement of human potential, anxiety for the new technology is inevitably amplified by ethical issues. In order to mitigate negative reaction for the emerging new technology, as the case of GMO for instance, **the risk governance for the medical use of the technology should also be incorporated into the Frame 2 and examined in connection with ethical issues.**

Comments on IRGC Recommendations (2)

Risk Communication Recommendations for Frame 1

Experimentally-insufficient data on hazard of certain material, once it is reported in a scientific journal, sometimes creates social anxiety, induces moratorium and huge R&D investment to apparent risk. Furthermore, even after it is scientifically denied by new experimental data, the effect of old information remains for a long time in people's consciousness.

Dr. J. Nakanishi proposes to set up a NANO-Toxicity-Panel to overcome the above situation, which will be operated on the net.

Major papers are released on the net where related papers are also able to be retrieved. The papers are reviewed by several reviewers of different disciplines, and signed reports on the papers are also released on the net. Eventually, reviewers take scientific responsibility on their signed reports and will be shifted through by later evaluation.

Dr. J. Nakanishi is planning to realize this framework in NEDO Project "Risk Assessment of Manufactured Nanomaterials" FY2006 - 2010

Comments on IRGC Recommendations (3)

Hazard, Exposure & Risk Recommendations for Flame 1

Urgent need for developing Internationally approved methodology for measurement and characterization of test samples, such as particle size, its distribution, shape, morphology, impurity etc. In particular, “deagglomeration” is one of the most important issues.

Urgent need for developing reliable measurement method for determining translocation of inhaled (absorbed) nanomaterials in a living body.

Importance of interdisciplinary collaboration between toxicologists and researchers specializing in physical, chemical and biological measurements and instrumentations

Importance of re-evaluation and improvement, if necessary, of the existing risk assessment procedures and regulatory measures for nanomaterials

Those for Flame 2

Need for proposal of a new social system like an ethical committee for solving the worst case of qualitatively-simulated future risk possibly caused by new technologies.

In general, people’s anxiety for risk by new technologies is awfully enhanced unless their growth and evolution can be foreseen.

Thank you for your attention

For further information:

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Research Center for
Chemical Risk Management