Japanese Government Policy for Nano EHS

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http://www.nims.go.jp
http://www.nanonet.go.jp
1. Basic Ideas

2. Strategic Priority Setting in S&T
   ◆ Promotion of basic researches
   ◆ Prioritization of R&D for policy-oriented subjects
     ● Priority promotion areas; Life science, IT, Environmental sciences, Nanotechnology & materials
     ● Promotion areas; Energy, MONODZUKURI tech., Infrastructure, Frontier (outer space & oceans)
   ◆ Promotion strategy for prioritized areas

3. S&T system reforms

4. Public Confidence and Engagement
   ◆ Responsible actions regarding ELSI
   ◆ Reinforcement of accountability and public relations of S&T activities
   ◆ Promotion of public understanding of S&T
   ◆ Facilitation of public engagement with S&T-related issues

5. Missions of CSTP
# Promotion Strategy for Nanotech. & Materials

## NANO-ELECTRONICS
- Next-Generation silicon-based electronics
- Nano-scale manufacturing technology for electronics
- Energy-saving & environmentally-friendly electronics
- Electron/photon-controlled nano-electronics
- Cost reduction tech. for electronic components
- Nano-electronics for security

## MATERIALS
- Materials to promote the use of unpopular energy
- Materials to deal with toxic substances
- Materials for environmental protection
- Materials for most advanced electro-apparatus
- Next-generation manufacturing technology
- Materials for highly efficient use of energy
- Substitution & saving tech. for rare or deficit Materials
- Materials for secure & safe society
- Materials for competitive transport equipment

## NANO-BIOTECHNOLOGY & BIO-MATERIALS
- Molecular imaging technology for analysis
- DDS and imaging tech. for treatment and diagnosis
- Detection technology for ultra traces of Substances
- Regeneration initiation materials
- Manipulation technology for molecules
- Apparatus with super-microscopic processing tech.
- Patient-friendly bio-devices
- Nano-biotechnology applied food

## FUNDAMENTALS for NANOTECHNOLOGY & MATERIALS
- Measurement & processing tech.
- Simulation and design Technology
- Human resource development and Environmental Improvement for R&D Activities
- Quantum beam utilization
- Responsible R&D of Nanotechnology

## NANO- and MATERIALS SCIENCE
- Quantum computational tech., clarification and control of interface functions, mechanism clarification of nano-scaled bio-systems, strongly correlated electronics
CSTP
NTPT

METI
Flagship type R&D
NEDO (FA)
AIST (RI)

MEXT
Basic research
JSPS (FA)
Universities
Long term challenge for industrial use
JST (FA)
Generic technology
NIMS (RI)
RIKEN (RI)

MHLW
Safety of foods & drugs
NIHS (RI)
Occupational health
JNIOSH (RI)

MOE
Environmental Protection
NIES (RI)

FA: Funding Agency
RI: National Research Institute

Research on Biological Impacts of Nanomaterials in Japan before FY 2004

- **Fullerene**
  - “Biological Effects of Fullerene”, Scientific Research for Priority Area “Carbon Cluster” led by Dr. E. Osawa, 1993-1995

- **Carbon nanotubes**
  - “Tissue Responsiveness and Bio-application of Nanotubes and Nano-micro Particles” by Prof. F. Watari (Hokkaido Univ.), et al.

- **Metals & Ceramics (Ni, Co, Fe, TiO$_2$, …)**
  - Toxicological study from a viewpoint of occupational health by Prof. Y. Kusaka (Fukui Univ.), NIIH, …
Japan’s Open Discussion on Societal Implications of Nanotechnology
Kicked off in August 2004

- Open Forum “Nanotechnology and Society”
  - Organized by AIST, August 2004 – March 2005

- Symposium “Nanotechnology and Society”
  - Organized by AIST, NIMS, NIES and NIHS, Feb. 1st, 2005

Symposium “Nanotechnology and Society”
Government Projects for Public Acceptance of Nanotechnology in Japan

- MEXT: Research study for public acceptance of nanotechnology (2005)
- MEXT: Multi-disciplinary expert panel on societal implications of nanotechnology (2006)
- METI–AIST: Standardization of nanoparticle risk evaluation method (2005-)
- METI-NEDO-AIST-Univ.: Risk assessment of manufactured nanoparticles (2006-)
- MHLW-NIHS: Development of evaluation methods for health impacts of nanomaterials (2005-)
- CSTP-AIST-NIMS: 2nd International Dialogue on Responsible Research and Development of Nanotechnology (June 2006)
First Japanese government project on Nano EHS and ELSI

5 working groups
- Risk assessment of nanomaterials (AIST)
- Health issues of nanomaterials (NIHS)
- Environmental issues of nanomaterials (NIES)
- Ethical and societal issues of nanotechnology (NIMS)
- Technology assessment for promoting the public acceptance of nanotechnology and economic effects (AIST)

Followed by “Multi-disciplinary expert panel on societal implications of nanotechnology”
Joint Royal Society- Science Council of Japan workshop on the potential health, environmental and societal impacts of nanotechnologies

1st: July 11-12, 2005, Royal Society (London)
2nd: February 23, 2006, Tokyo Big Sight (Tokyo)

Participants from academia, industries, government and national institutes

- **UK**: Prof. M. Welland, Prof. A. Seaton, Prof. J. Ryan, Prof. K. Donaldson, Prof. V. Stone, Oxonica, DTI, DEFRA, HSE, NPL, …
- **Japan**: Dr. K. Kurokawa, Dr. T. Kishi, Prof. M. Endo, Prof. T. Tsuda, Prof. Y. Kusaka, NBCI, AIST, NIMS, NIES, NIHS, NIIH, …
- **USA**: Dr. J. Moore, Dr. A. Maynard
The 2nd International Dialogue on Responsible Research and Development of Nanotechnology

June 27-28, 2006, Gakushi-Kaikan, Tokyo

Organized by Dr. H. Abe (CSTP), Dr. H. Yoshikawa (AIST), and Dr. T. Kishi (NIMS), and moderated by Dr. K. Tanaka (JST, AIST)

88 participants from 21 economies and EC (policy makers, academia, expert, private sectors, …)

Breakout discussion (facilitator)

- EHS (Dr. B. Karn)
- ELSI (Prof. A. Rip)
- Education and Capacity Building (Dr. T.-K. Lee)
- Developing Counties Issues (Dr. T. Pornsinsirirak)
- Standard Setting (Dr. P. Hatto)